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Technologies and Practices to Promote Collaboration in a Nonprofit Network

CAPSTONE REPORT

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Technology and Practices to Promote Collaboration in a Nonprofit Network

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Abstract

Nonprofit organizations form networks with other nonprofits and relevant stakeholders that are categorized by regular communication, resource sharing, and aligned goals. Collaborative technologies provide these networks with systems for streamlining work processes, collecting information, and making knowledge more accessible. Collaborative technologies can be further utilized to provide project management and web-communication tools that facilitate collaboration and camaraderie amongst users. This research study notes best practices including knowledge of system features and considerations, implementation techniques, and user engagement.

Keywords: nonprofit network, collaborative technologies

Table of Contents

Introduction

Problem

Nonprofit organizations are entities that utilize their resources and profits to advance social causes and serve targeted groups, allowing these organizations to receive access to tax-exemptions and formal grant funding that supports operations (Nonprofit organization, n.d.; Austin & Seitanidi, 2012a). Nonprofits operate within complex systems with unique challenges and restrictions, requiring them to work with government agencies, private sponsors, and other nonprofit groups to fulfill the scopes of their individual missions (Austin & Seitanidi, 2012b). These relationships create a consortium of organizations that have aligned missions and services, operate within close proximity to one another, and depend on interrelated knowledge and resources to fulfill independent goals, creating a *nonprofit network* (Atouba & Shumate, 2015; Grandgenett, Thiele, Pensabene, & Mcpeak, 2015).

The benefits for nonprofit networks to innovate existing processes are defined by Austin and Seitanidi (2012b) as accessibility to more resources and strengthened working relationships built on trust and improved conflict resolution, which leads to more efficient services and streamlined operations. The ability to partner with mature nonprofits provides groups with the opportunity to enhance their own credibility and network with stakeholders through more established organizations (Atouba & Shumate, 2015). However, without the appropriate technological infrastructure or personnel support, nonprofit networks struggle to combat information silos and coordinate services to better serve shared clients (Grandgenett et al., 2015; Kolfschoten, Niederman, Briggs, & de Vreede, 2012).

Though the vast majority of nonprofit administrators surveyed by Austin and Seitanidi (2012a) agree that it is their social responsibility to share resources with other nonprofits if doing

so serves the respective missions of the nonprofits they serve, they report a lack of technical tools for their networks to cohesively collect, organize, and disseminate knowledge. One potential solution to this problem that has been pursued by nonprofits with varying degrees of success is the use of collaborative technologies to aid in the sharing of resources and knowledge among compatible nonprofit organizations (Grandgenett et al., 2015). C*ollaborative technologies* are information management and workflow support applications that enable teams in remote or in-person environments to perform efficiently and creatively (Briggs, 2006). The effective use of collaborative technology is a crucial requirement for organizations managing a knowledge management network to quickly access and share specialized information (Bayrak, 2015).

When different nonprofits and their employees attempt to work together with other organizations to research, select, and learn how to use collaborative technology services, they are frequently unsuccessful, with users lacking sufficient training, failing to extract meaningful value from the systems, and unable to use the tools to enhance their existing practices (Briggs, 2006; Iverson & Burkart, 2007; Recker, Mendling, & Hahn, 2013). If partners do not share the same goals, equally contribute resources, or understand how these resources can support their organizational goals, collaborative technology cannot be implemented in a meaningful way (Iverson & Burkart, 2007; Nath, 2011; Vaidya & Seetharaman, 2011). As such, the technology selected must be designed to enhance existing communication channels and supplemented with training and support to ease the adoption of the software (Recker et al., 2013).

Even if a system does have the potential to add significant value as a collaboration tool, it requires technical experts to implement the technology and conduct training for nonprofit executives and system users (Bryson, Berry, & Kaifeng, 2010; Shen, Lee, & Cheung, 2012). Ineffective training can result in users failing to efficiently integrate the new system into regular

organizational practices to maximize benefits (Dinh, Rinfret, Raymond, & Bich-Thuy, 2013; Recker et al., 2013). Yet some software suites offer intuitive, easy to comprehend interfaces or can be tailored to meet the needs of a network in the absence of an expert system facilitator (Briggs, Kolfschoten, de Vreede, Lukosch, & Albrecht, 2013). Another challenge in nonprofit networks is that those that do utilize collaborative technology are more likely to partner with other nonprofits in their region with a similar organization structure (i.e., staff size, age of the organization, and impact potential) rather than formally connect with organizations with similar missions that are located outside of their regions or who have yet to achieve the same level of credibility (Atouba & Shumate, 2015). Therefore, the success of a nonprofit network in using collaborative technology to manage knowledge relevant to serving the missions and clients of the individual nonprofit members is dependent on selecting software designed to enhance current communication and administrative practices, as well as managing employees to ensure competency in using this technology (Bryson et al., 2010; Shen et al. 2012).

Purpose Statement

The purpose of this study is to identify best practices for the use of collaborative technology and accompanying operational practices by nonprofit networks to manage shared knowledge and to serve the aligned missions of the participants. In the context of this study, collaborative technology is defined as software that allows partners to work together on a joint endeavor from different locations by providing digital communication, management, process support, and information sharing (Armstrong, 2013; Munkvold, & Zigurs, 2006). Nonprofit networks are defined as a group of nonprofit organizations that have aligned missions and related services or clients who form partnerships with one another, share resources, and strategically collaborate to achieve mutually beneficial objectives (Lagace, 2005; Nutt, 1984). This study is

intended to enable nonprofit directors, administrators, and technical consults to identify potential technology to use to enable shared knowledge and collaboration, as well as to implement the associated practices and operational roles that provide the highest likelihood of success.

Research Question

What collaborative technologies and related operational best practices enable nonprofit networks to work together and share knowledge in support of individual organizational goals?

Audience Description

Directors of nonprofit organizations benefit from understanding how utilizing collaborative technologies within their existing networks can enable them to achieve specific goals while collaborating with peer organizations (Iverson & Burkart, 2007). Additionally, for nonprofits that are considering collaborative technologies, recognizing the requirements of their specific networks enables software selection committees to evaluate which system tools and features best help users communicate with the larger group and contribute their individual knowledge so others can access, understand, and reuse it (Dinh et al., 2013). If the senior managers of participating organizations do not champion the use and implementation of collaborative technologies or effectively communicate the larger goals and expectations for the software with their teams, nonprofit staff members are less likely to skillfully use the software and contribute their knowledge to the greater network (Armstrong et al., 2013; Zorn, Flanagin & Shoham, 2011). Nonprofit executive directors, program administrators, and clients therefore benefit from a research study that explores best practices in both collaborative technologies and related operational practices (Briggs, 2006).

As collaborative technologies requires financial investment in software and training (Iverson & Burkart, 2007), grant funders whose mission is to serve the marginalized groups supported by nonprofits also benefit from understanding how an investment in collaborative

technologies creates and sustains systemic change. This research provides perspective when evaluating grant applications and projects that aim to create transformative social change by improving collaboration with other nonprofits. Proposal reviewers can better evaluate whether an applicant has considered the associated complexities and challenges of implementing collaborative technologies (Moon, Choe, Chung, Jung, & Swar, 2016). Software designers, as well, can understand the nuances of the nonprofit sector and design technologies to reflect these considerations.

Search Report

Search strategy. The scope of research focuses on how nonprofit organizations collaborate in their existing networks, collaborative technologies features and tools that are optimal for the nonprofit sector, and the organizational practices that best enable nonprofit networks to adopt and use software for its intended purpose. A variety of keywords and search databases are selected to provide a range of resources. University of Oregon (UO) Libraries portal serves as the primary gateway for finding relevant sources and Google Scholar is employed if a source is not available in full text via the UO Libraries. Citations within the literature are mined if they are directly relevant to the research or appear in multiple reference sources to ensure a variety of supporting literature is considered.

Peer-reviewed academic journals are the primary reference material for this research. While a limited amount of research exists on collaborative technologies within nonprofits, broader sources are selected to give a comprehensive understanding of different tools and features currently available, as well as how they can be utilized specifically in nonprofit networks.

Search engines and databases. To better understand the different contributing factors related to the research questions, databases for administration, information systems, management, non-profit, public policy, nonprofits, organizational behavior, and technology are utilized. The following databases in particular are queried to compile resources:

- Academic Search Premier;
- Academia.edu;
- American Policy Directory;
- Computer Source;
- CiteSeerX;
- Education Resources Information Center (ERIC);
- Google Scholar;
- JSTOR;
- PAIS (Public Affairs Information Service);
- ProQuest;
- UO Libraries;
- Web of Science; and
- Wiley Online Library.

Key terms. The following key terms are used to find sources related to the research topics:

- collaborative engineering nonprofit;
- collective knowledge technology;
- collaboration software;
- collaborative technology;

- collaborative technology teams;
- collaborative technology nonprofit;
- collaborative technology networks;
- knowledge management system;
- knowledge collaboration technology;
- knowledge technology;
- information portals;
- motivating collaborative technology;
- nonprofit collaboration;
- nonprofit collaboration support;
- nonprofit knowledge technology;
- nonprofit network;
- nonprofit partner technology;
- nonprofit technology; and
- nonprofit team technology.

Documentation approach. Zotero reference management software is the primary tool for tracking all sources considered during the research process. Abode Acrobat PDF files of articles are saved to the author's personal hard drive to allow for quick access. Zotero is utilized for tracking citation information, tagging documents with related key words, and storing detailed notes on the text. Sources are connected with other references via Zotero according to the topics examined (e.g., collaborative technologies, nonprofit practices, and best practices).

Evaluation criteria. References are evaluated using the list of five criteria retrieved from the Center for Public Issues in Education website *Evaluation Information Sources* (Center For

Public, 2014). The five criteria used for evaluation are authority, timeliness, quality, relevancy, and bias.

Authority. Sources culled from peer-reviewed research journals that are authored by academic researchers are the primary source of information. Examining the author biographies for educational degrees obtained, ongoing work within academia, and authorship of related literature enables a determination of the authority of the source. Focusing on literature from peer-reviewed scholarly journals indicates that other experts in the field have examined the findings and provided feedback prior to publication, indicating that the findings are accepted by other academic experts.

Timeliness. Sources older than five years are not considered unless they provide an overview of nonprofit collaboration trends, or the functions, challenges, and potential benefits of collaborative technologies to frame the context in which the problem exists. This approach is intended to ensure that the author is versed in contemporary collaboration tools and able to determine how these innovations should be considered for the current nonprofit sector.

Quality. Academic, peer-reviewed journals are the primary source for content. To determine if the research has a credible basis, references and citations are reviewed to determine if claims can be supported with peer-reviewed journals articles, books written by academics, and public policy literature. This assessment shows how much research is conducted to support claims and if the author has a potential bias by a lack of diverse perspectives in sources they reference. Documents with consistent spelling or grammar mistakes are not considered for this study, as these types of mistakes indicate a lack of formal review and consideration for how the author's research is presented.

Relevancy. As the research explores how nonprofit groups can utilize collaborative technologies, sources are reviewed to see if findings are applicable for this purpose. Literature on nonprofit networks using these tools limited; therefore the author explores applications of collaborative technologies in different public sectors. The research explores how the practices and software design of networks that successfully use collaborative technologies can be applied to nonprofit networks.

Bias. Initial readings of the research consider the authors' writing style to consider if statements are supported by reputable research, as opposed to personal point of view. Author biographies are located via a Google search and evaluated to determine if the authors are affiliated with special interest groups. These considerations help determine if an author's intention is to explore the topic without a preference for one side. Additionally, the sources cited in research are examined to see if the author utilized different perspectives for synthesizing their argument.

Annotated Bibliography

The annotated bibliography is comprised of 15 resources that identify and explore components of the research of what collaborative technologies and related operational best practices enable nonprofit networks to work together and share knowledge in support of individual organizational goals. The sources are categorized as follows: how nonprofits collaborate and common challenges, collaborative technologies and associated network benefits, and best practices for using collaborative technologies. These literature sources are utilized to provide readers with an understanding of the status quo of nonprofit collaboration, specific collaborative technologies and their functions, and how these tools can be best applied. References are presented with a bibliographic citation, abstract, and summary that shows the relevancy of each source to this research.

Category 1: How nonprofits collaborate and common challenges

Austin, J. E., & Seitanidi, M. M. (2012a). Collaborative value creation: A review of partnering between nonprofits and businesses: Part I. Value creation spectrum and collaboration stages. *Nonprofit & Voluntary Sector Quarterly, 41*(5), 726-758. doi: 10.1177/0899764012450777

Abstract. This focused review of the nonprofit-business collaboration and related corporate social responsibility literature identifies problematic aspects of the treatment of value creation and, therefore, develops a conceptual and analytical framework to address them and the following research question: How can collaboration between nonprofits and businesses most effectively concrete significant economic, social, and environmental value for society, organizations, and individuals? The first two components of the Collaborative Value Creation framework are presented in this first of two articles The

Value Creation Spectrum provides new reference terms for defining and analyzing value creation, and Collaboration Stages reveals how value creation varies across different types of collaborative relationships. The framework's next two components, which are elaborated in the sequential article, are Partnering Processes, which reveals the value creation dynamics in the formation and implementation stages, and Collaboration Outcomes, which examines impact at the micro, meso, and macro levels.

Summary. The authors, professors of business administration at Harvard University and University of Hull, conduct a literature review to explore the Collaborative Value Creation (CVC) framework and relationships in cross-sector partnerships between nonprofits and profit-driven organizations. The authors define collaborative value as "the transitory and enduring benefits relative to the costs that are generated due to the interaction of the collaborators and that accrue to organizations, individuals, and society"(p. 728). Networks can create collaborative value if they have compatible resources, distinctive but relevant competencies and aligned interests and are motivated to address a social problem. Nonprofit organizations have traditionally favored partnerships with other nonprofits and will usually work with a business when seeking financial support. These exchanges can be elevated from simple philanthropic donations to transformative partnerships that create meaningful change. To do so, partners must be committed to transparency and establishing relationships with community members and be united by shared goals.

While this literature is centered on nonprofit and business partnerships, it provides insight that can be applied to nonprofit networks. This source is relevant to this study as it identifies variables that predict successful partnerships. It argues that collaborations are

more likely to ignite and sustain system-wide change when members agree to formalize their partnership beyond resource exchanges, and be social change agents.

Austin, J. E., & Seitanidi, M. M. (2012b). Collaborative value creation: A review of partnering between nonprofits and businesses. Part 2: Partnership processes and outcomes. *Nonprofit & Voluntary Sector Quarterly, 41*(6), 929-269. doi: 10.1177/0899764012454685

Abstract. In this second half of a two-part focused review of the nonprofit business and corporate social responsibility (CSR) literature, the authors present the third and fourth components of the collaborative value creation (CVC) framework: the partnering processes that unpack the value creation dynamics and the collaboration outcomes that examine the benefits and costs on multiple levels. The authors suggest that greater value is created at all levels of analysis, micro, meso, and macro, as collaboration moves from sole creation to co-creation of value. The CVC framework assigns equal importance to all forms of value (economic, social, and environmental), types of actors (individuals, organizations, and societies), and time scales (short/long term), providing the analytical paths for assessing value creation holistically. Examining systematically the processes and the outcomes of value co-creation allows for greater specificity, dimensionality, and inclusivity. The article concludes by delineating the contribution of the CVC framework and offering recommendations for future research.

Summary. This source examines how meaningful and sustainable social, economic, and environmental change can be created through nonprofit and business collaborations. Documenting and committing to anticipated costs and responsibilities is advised to mitigate potential misunderstandings. Partners should share their organizations' primary

and secondary goals for the partnership and determine what projects within the different organizations are best aligned and can benefit from collaborative technologies. Senior directors should lead the initiatives to determine which organizations may be best suited for cross-collaboration and should champion the final projects. As the teams begin working together, open channels for communication and regular meetings amongst stakeholders provide opportunities to share updates, identify risks, and solidify comradery (i.e., interactive value). Finally, as the relationship between organizations becomes institutionalized, repositories for knowledge and shared values must be established to sustain communication and unity as leadership and key players change. The authors note that following these guidelines should theoretically increase awareness of the organizations' missions, produce additional tangible and intangible resources, help team members perform more efficiently, and develop positive change for their clients.

This article is relevant to the research as it defines specific steps and considerations for successful partnerships with nonprofit organizations. The authors offer insights into how nonprofits should assess potential partnerships with other organizations and how they can build and foster these relationships.

Zorn, T.E., Flanagin, A.J., & Shoham, M.D. (2011). Institutional and noninstitutional influences on information and communication technology adoption and use among nonprofit organizations. *Human Communication Research, 37*(1), 1-33. doi: 10.1111/j.1468-2958.2010.01387.x

Abstract. In this study, nonprofit organizations (NPOs) in New Zealand were surveyed to explore influences on adoption and use of information and communication technologies (ICTs). We sought to extend existing research by considering 'institutional'

influences alongside organizational and environmental features and by examining how institutional forces affect optimal use of ICTs. Findings suggest that NPOs adopting and using ICTs tended to be self-perceived leaders or those who scanned the environment and emulated leaders and tended to have organizational decision makers with the expertise to enable adoption and use. Furthermore, optimal fit of ICTs tended to be spurred by institutional forces if accompanied by self-perceived leadership and appropriate organizational resources. Implications for practice and theory are explored.

Summary. This research surveys 1,046 nonprofits in New Zealand in an effort to determine how organizational culture influences the use of information and communication technology and its success in improve efficiency and communication. The authors, professors of organizational communication who reside in New Zealand and the United States, use a literature-review to frame the environment for nonprofit networks worldwide by noting that determinants of success or failure are less nebulous than those of for-profit organizations, and that volunteers account for a significant percentage of the nonprofit workforce, hindering accountability standards. The survey results indicate that nonprofits use collaborative technologies more for stakeholder engagement purposes than communication and resource sharing within their larger network. The research suggests that technical knowledge, outcome expectations, awareness of how other nonprofits use technologies, and the support of organization directors and managers are indicators that a nonprofit will successfully use collaborative technologies. The authors state that social-based learning is the most effective way to train employees on how to use software to produce value.

This source is useful for this study because it recognizes the potential institutional barriers for nonprofit organizations that are adopting different technologies. Examining nonprofits from a nationwide perspective enables the identification of common challenges and considerations to be addressed before an organization invests in collaborative technologies.

Category 2: Collaborative technologies and associated network benefits

Armstrong, A. (2013). The digital toolbox: An introductory guide to collaboration technology. *Journal of Staff Development, 34*(1), 26-31. Retrieved from Google: http://learningforward.org/docs/default-source/jsd-february-2013/armstrong341.pdf?sfvrsn=2

Abstract. In the report, Killion shares five purposes for collaboration among learners: Co-construct knowledge, share experiences, reflect on practice, seek feedback, and contribute to the learning of others. Fortunately, most of the collaborative tools available allow users to perform some of these functions at various levels. However, determining which tools or services best support a specific professional learning system can be complex and frustrating - especially since the number and type of features each service offers can vary a great deal.

Summary. The author, the president and CEO of Indiana University's Research & Technology Corporation, provides a guide of different collaborative technologies designed to transmit knowledge and support decision-making processes. The author's primary reference is the survey of Joellen Killion, a public education administrator who integrated concepts of professional development, systems processes, and critical thinking concepts into the Standards for Professional Learning, which identifies collaborative

tools for learning and managing knowledge**.** Free social media applications are identified for supporting discussions; sharing documents; centralizing and editing materials; and communicating via voice, video, and screen sharing functions. Optimal tools for educating team members are blogs, videos, live chats, and discussion threads, as they allow users to pose questions and discuss their work with team members more efficiently. Application suites can provide multiple communication systems for project management, office processes, and knowledge repositories to meet a group's comprehensive needs. This source is valuable for this research as it identifies and endorses specific collaborative technologies ideal for different purposes and considerations. This report allows readers to assess which systems are optimal for their teams.

Bayrak, T. (2015). Identifying collaborative technology impact areas. *Technology in Society, 42*, 93-103. doi:10.1016/j.techsoc.2015.04.001

Abstract. Collaborative technologies such as wireless/handheld technologies can be critical to the success of an organization. Such technologies can be very helpful for problem solving, communication, computing, collaboration, and improving industries as a whole. Measures of impact of collaborative technologies on organizations narrowly focused on communications impacts. This study recognizes that assessing the impact of collaborative technologies is complex and should be viewed from a variety of perspectives. The purpose of this research is to identify and to investigate the multiple impacts of collaborative technologies on organizations at the level of the individual end-user.

Summary. The author examines how collaborative technologies affects organizational performance, as well as the value it adds to individuals work. Bayrak, a professor of

business information systems at Western New England University, cites research studies that discuss why organizations may not embrace collaborative techniques despite proven advantages, due to institutional influences or degree of trust within the group. The author focuses on how technologies can support *distributed cognition* collaboration that empowers an individual to act independently but still consult different knowledge sources to determine the best course of action. The author advocates for communicating to individual users how adopting collaborative technologies will enhance their own performances and empower them to actively contribute knowledge to benefit the larger network of users. The primary advantages of collaborative technologies are the ability to store and share information, enhanced communication within the network and stakeholders, and tools for managing and controlling group projects.

This source is useful for this study because it outlines how collaborative technologies can best be integrated to add value to an organization. It presents these benefits with consideration of organizational leaders and system users that may be reluctant to embrace these new tools.

Briggs, R.O., Kolfschoten, G.L., de Vreede, G.J., Lukosch, S. & Albrecht, C.C. (2013). Facilitator-in-a-Box: Process support applications to help practitioners realize the potential of collaboration technology. *Journal of Management Information Systems, 29*(4), 159-194. doi: 10.2753/MIS0742-1222290406

Abstract. The potential benefits of collaboration technologies are typically realized only in groups led by collaboration experts. This raises the facilitator-in-the-box challenge: Can collaboration expertise be packaged with collaboration technology in a form that nonexperts can reuse with no training on either tools or techniques? We address that

challenge with process support applications (PSAs). We describe a collaboration support system (CSS) that combines a computer-assisted collaborative engineering platform for creating PSAs with a process support system runtime platform for executing PSAs. We show that the CSS meets its design goals: (1) to reduce development cycles for collaboration systems, (2) to allow nonprogrammers to design and develop PSAs, and (3) to package enough expertise in the tools that non-experts could execute a well-designed collaborative work process without training.

Summary. The authors, professors of information systems, technology, and collaborative sciences, use defined science research to assess how collaborative technologies can be successfully implemented and utilized under the guidance of a non-expert, rather than a formal facilitator. The authors conduct design science research to determine if collaborative support systems and process support applications can be engineered to provide users with easy and productive services. Using process restrictiveness to limit the configurations available can help the team learn how the applications can be applied to specific tasks, rather than the system as a whole. However, this approach blocks the users from understanding the relationships between individual work and the value of the resource, and the opportunity to collaborate and encourage creativity. The authors find that a more collaborative approach is for the software designer to work with team members to develop solutions that support existing practices and ensure that stakeholder goals for the technologies are satisfied. To further explore this concept, the authors define and use case studies to illustrate collaborative technologies such as processes support applications (PSA), collaborative support system (CSS), and group support systems (GSS).

The source is relevant to this research as it introduces a vocabulary for the configurable properties available in collaborative software and provides an analysis of the performance of tools in different practices.

Dinh, T. L., Rinfret, L., Raymond, L., & Bich-Thuy, D. (2013). Towards the reconciliation of knowledge management and e-collaboration systems. *Interactive Technology and Smart Education, 10*(2), 95-115. doi:10.1108/ITSE-09-2012-0022

Abstract. The purpose of this paper is to propose an intelligent infrastructure for the reconciliation of knowledge management and e-collaboration systems. Literature on e-collaboration, information management, knowledge management, learning process, and intellectual capital is mobilized in order to build the conceptual framework. This paper presents a conceptual framework including a set of concepts and guidelines that can be used to specify an efficient knowledge infrastructure for networked enterprises. Results from this study uphold the emerging research area of knowledge management in e-collaboration systems. The proposed framework derived purely from theory and conceptual analysis; more work needs to be done in order to validate and experiment with the framework. Future research remains be carried out to apply the framework on a broader scale, and in particular to determine its applicability relative to various collaboration patterns and current technology development. Results from this study are important for networked enterprises, especially knowledge-intensive enterprises, who intend to build e-collaboration systems to organize their knowledge base and to share it with their partners. This paper is one of the first to address collaborative knowledge management in e-collaboration systems with a focus on the promotion of learning process and the creation of intellectual capital.

Summary. The authors, professors of information systems based out of Canada and Vietnam, describe how basic collaborative technologies such as email and document sharing are ingrained in everyday work patterns, and hypothesize that new tools could be developed to streamline knowledge management practices. E-collaboration systems that facilitate communication and knowledge management software (KMS), which categorizes, stores, and retrieves information are key infrastructural components. Utilizing this software can improve communication channels and information management systems, as well as create and foster more opportunities for team members to work together on projects. The authors recommend designing a system architecture that recognizes the barriers in knowledge transfer, such as different terminology, levels of understanding, availability of information, and communication styles. The authors develop a conceptual framework for a system at different stages of knowledge management: creating information that encompasses processes, methodology, and context; stores information in a system that reflects the organization's cultures and enterprise structures; offers channels for users to easily access, understand, and apply these resources; and identifies coordinated tasks to create larger routines.

This resource is valuable for this study as it describes system architecture for collaborative technologies that can best support knowledge management and communication. The authors present considerations for assessing which tools and features should be prioritized when selecting collaborative technologies for a team to use.

Keith, M., Demirkan, H., & Goul, M. (2010). The influence of collaborative technology knowledge on advice network structures. *Decision Support Systems, 50*(1),140-151. doi: 10.1016/j.dss.2010.07.010

Abstract. This research describes an experiment designed to understand how an individual's knowledge concerning task-critical technologies influences the structure of their advice network relationships. The results indicate that an individual's technology knowledge leads them to become more central depending on the type of technology, their formal group structure, and task uncertainty. These results contribute to the theory on advice networks by demonstrating how individual knowledge, task uncertainty, and group departmentation influence the evolution of an advice network structure. It suggests that managers should make informed decisions about the formal group structuring and technology training which can improve their employee's advice networks.

Summary. The authors, professors of business administration and information systems, discuss existing scholarly research that demonstrates the benefits of collaborative technologies and why organizations and employees are reluctant to adopt these tools. Organizations within the same location and that have similar missions often form *advice networks*, in which associates informally consult and advise peers. Creating a centralized repository for this information, instead of relying on the knowledge of specific individuals, provides nonprofit networks with valuable information and allows members to work more efficiently. To foster this process, managers are encouraged to make technical training an ongoing process and actively use the technology themselves.

This source is valuable to this study as it defines the benefits and challenges of adopting and using collaborative technology. By recognizing how existing practices can be modified to optimize performance, the authors show how existing networks can use collaborative technologies to improve current practices and create value for all users.

Category 3: Best practices for using collaborative technologies

Briggs, R.O. (2006). On theory-driven design and deployment of collaboration systems. *International Journal of Human-Computer Studies, 64*(7), 573-582. doi:10.1016/j.ijhcs.2006.02.003

Abstract. Early efforts to design and deploy collaboration systems were more art than science, but they produced some solid successes. Commercial groupware products now support millions of collaborations per year. Under certain circumstances teams that use group support systems perform far better than groups that do not. However, as impressive as the achievements are in this field, we can do better. A rigorous theoretical approach to the design of collaboration technology and process can lead us to non-intuitive design choices that produce successes beyond those possible with an intuitive, seat-of-the-pants approach. This paper explains the simple structure of a rigorous scientific theory and offers examples of theory-driven design choices that produced substantial benefits. It then differentiates rigorous theory from several classes of theory that have intuitive appeal, but cannot inform design choices. It concludes that the logic of the theory-driven design approach suggests that the most useful focus for collaboration technology researchers would be the technology-supported work-process, rather than just the technology.

Summary. The author, a professor of business at San Diego State University, examines collaborative technologies design theories to explore how these tools can support work processes. Focusing on group support systems (GSSs), the author states that the absence or presence of aligned goals, amount of individual participation, and outside distractions all influence group productivity. Referencing Alex F. Osborn's and other's work on brainstorming, Briggs notes that a GSS can be crafted to encourage creativity by allowing participants to build on each other's ideas and share feedback. As such, the software

should interact and solicit information from the users to ensure conceptual understanding, provide an informative overview of related processes, and collect additional data as needed. Therefore, creativity, cohesion, and efficiency are deemed the most important factors for collaborative technologies in supporting productivity and effectiveness.

This research is valuable for this study as it outlines how social theories of group process can be incorporated into the design of collaborative technologies. The author provides information on the importance of different system features and how the features fit in with established academic theories.

Finn, J. (2010). Collaborative knowledge construction in digital environments: Politics, policy, and communities. *Government Information Quarterly, 28*(3), 409-415. doi: 10.1016/j.giq.2010.10.004

Abstract. How individuals share information with respect to politics and policy in networked research environments is an area ripe for interdisciplinary study. In this analysis, I explore some of the more current and salient research findings from several disciplinary literatures (communications, computer science, organizational behavior, information science, and public policy) to examine how current research perceives the influence of technology-aided communications on policy-making conversations. I suggest that a community-centric view, which takes into account online and offline group affiliations and their related power dynamics, is just as important as an individual-based unit of analysis. This understanding points to directions for the thoughtful creation of digital resources that appropriately reflect and support inter- and intra-group knowledge-sharing behavior.

Summary. The author, a former librarian and a current information studies doctoral student, analyzes how the perception and usage of information and communication technology is influenced. Ms. Finn conducts a literature review to build a theory that existing digital experience and competency shape how a person or group approaches collaborative technologies. The author determines that personal history may determine whether knowledge management and communication software add value or create misinformation. The author concludes that the barriers for using technology can be removed by increasing accessibility, offering operating support to users, and ensuring that the entire community uses its features.

This source is useful for this study because the author explores how social, political and economic issues surrounding how group members adopt and use collaborative software can influence the organization as a whole. This research allows the reader to determine how different system tools and organizational practices can be modified to address nuances within an organization.

Iverson, J. & Burkart, P. (2007). Managing electronic documents and work flows: Enterprise content management at work in nonprofit organizations. *Nonprofit Management and Leadership, 17*(4), 403-419. doi:10.1002/nml.160

Abstract. Web management and knowledge management systems have made significant technological advances, culminating in large information management systems such as enterprise content management (ECM). ECM is a Web-based publishing system that manages large numbers of electronic documents and other Web assets intended for publication to Web portals and other complex Web sites. Work in nonprofit organizations can benefit from adopting new communication technologies that promote collaboration

and enterprise wide knowledge management. The unique characteristics of ECM are enumerated and analyzed from a knowledge management perspective. We identify three stages of document life cycles in ECM implementations—content, reification, and commodification/process—as the content management model. We present the model as a mechanism for decision makers and scholars to use in evaluating the organizational impacts of systems such as ECM. We also argue that decision makers in nonprofit organizations should take care to avoid overly commodifying business processes in the final stage, where participation may be more beneficial than efficiency.

Summary. The authors, professors of communication at Texas A&M University, explore how *enterprise content management* (ECM) systems improve operations for nonprofits through knowledge management and by providing communication tools like discussion boards. ECMs can improve workflow by allowing users to collect information about an assignment, solicit advice from peers, track progress, and share results with their team. A case study of a nonprofit that adopted an ECM resulted in a 50% reduction of staff overtime and 30% increase in work output. However, without considerations for organizational culture, ease of understanding, and communication support, an ECM can be underutilized or misused, hindering its value.

This source is useful for this study because ECMs like SharePoint and Open Text offer social tools to compliment the knowledge management components of ECMs, creating a system that better supports collaboration by allowing users to share ideas and edit documents created by the team. This approach demonstrates an evolution in knowledge management software to augment information storage and retrieval functions to provide tools that break down tasks and workflows and promote collaboration.

Kolfschoten, G.L., Niederman, F., Briggs, R.O., & de Vreede, G.J. (2012). Facilitation roles and responsibilities for sustained collaboration support in organizations. *Journal of Management Information Systems, 28*(4), 129-162. doi:10.2753/MIS0742-1222280406

Abstract. Research shows that under certain conditions, groups using collaboration technologies such as group support systems (GSS) can gain substantial improvements in the effectiveness and efficiency of their work processes. GSS, however, have been slow to develop self-sustaining communities of users in the workplace. Organizations that use collaboration technologies may require two kinds of support: process support and technology support. Both types of support involve (1) design tasks (e.g., designing a work process and designing the technology to support the process), (2) application tasks (to apply the process and to use the technology), and (3) management tasks (to monitor and control the process and to oversee the maintenance of the technology). This paper explores how these tasks and associated roles can be anchored in organizations, and the relationship of task allocation patterns to the sustained use of collaboration technology in organizations.

Summary. The authors, group collaboration, informational management, and information systems researchers, use a literature review and interviews to examine the benefits of group support systems (GSS) software for improving group collaboration, as well as the challenges in implementing this technology. The authors highlight the importance of a facilitator in this process for defining the scope of the system, coordinating user training, and determining accountability for continued use. Yet many facilitators struggle to simultaneously oversee system design, budget, and standards for using the technology. The authors demonstrate how these tasks can be defined and

delegated to support implementation. Additionally, ensuring that the software is easy to use, and valuable for a range of projects make this adoption easier for the group.

This source is useful for this study because it shows how a team can implement collaborative technology without investing in an outside facilitator to train the group. This research also emphasizes the importance of a champion who can manage the project requirements and ensure that communication and comprehension of the collaboration technologies and associated processes are strong amongst team members.

Nath, J. (2011). Reimagining government in the digital age. *National Civic Review, 100*(3), 19-23. doi:10.1002/ncr.20070

Abstract. Public sector organizations across the country are facing declining revenues, an aging workforce, and citizens who demand better and faster services. A typical response to these challenges would be to reduce government workforces and cut services, but there are reasons to hope that the often-stated but rarely realized promise of doing more with less may soon become a reality for many government organizations. On January 21, 2011, President Obama issued a memo declaring transparency, collaboration, and participation as among his most important values. He asked agencies to pursue these goals with the use of innovative tools, methods, and systems and to cooperate among themselves, across all levels of government, and with nonprofit organizations, businesses, and individuals in the private sector. Obama's memo is part of a new movement for open government or, as I refer to it, Government 2.0. Just as the Web 2.0 shifted the traditional paradigm of users as passive consumers of content to creators, Government 2.0 will allow citizens opportunities to participate and contribute value in a new architecture of openness and collaboration.

Summary. A January 2011 memo from United States President Barack Obama states that the most important values for public sector organizations are transparency, collaboration, and participation with government, nonprofits, private businesses, and individuals. Nath, the Chief Innovation Officer for the City of San Francisco and White House Champion of Change, refers to this paradigm as *Government 2.0*, in which multiple agencies contribute knowledge and valuable content to a larger network. To create transparency, government agencies need to make their research, or the useful data compiled from it, available to the public in a format that is accessible and invites others to contribute relevant knowledge as well. To illustrate this notion, the author highlights the Urban Forest Map website that uses data from the City of San Francisco and the Friends of the Forest nonprofit and input from users to provide San Francisco residents with locations of various local trees and green spaces. Additionally, this website uses open-source software so other municipalities and nonprofits can utilize these features. To promote collaboration, the author advocates for using social media and knowledge sharing networks (e.g., GovLoop) where users can share valuable information and connect with peers in different locations. The author concludes that usage of digital platforms and technologies is crucial for government agencies to achieve the Government 2.0 paradigm.

This source is useful for this study because it explores case studies of organizations that have successfully used collaborative technologies and how these tools were crafted to encourage participation amongst different users and create value. It also addresses the larger political environment and how it promotes creative collaboration

through systems that are remotely accessible, use open source coding, and invite users to contribute content.

Recker, J., Mendling, J., & Hahn, C. (2013). How collaborative technology supports cognitive processes in collaborative process modeling: A capabilities-gains-outcome model. *Information Systems, 38*(8), 1031-1045. doi:10.1016/j.is.2013.04.001

Abstract. We examine which capabilities technologies provide to support collaborative process modeling. We develop a model that explains how technology capabilities impact cognitive group processes, and how they lead to improved modeling outcomes and positive technology beliefs. We test this model through a free simulation experiment of collaborative process modelers structured around a set of modeling tasks. With our study, we provide an understanding of the process of collaborative process modeling, and detail implications for research and guidelines for the practical design of collaborative process modeling.

Summary. The authors, professors of information systems and business based in Australia, Germany, and Austria, create an empirical study to explore how group work processes can be supported with collaborative technologies. A process model is used to show how information is translated into a course of action and results to determine where knowledge management tools can best support teams in different locations in collaborating together. Communication, problem-solving, and information accessibility are identified as high priorities that can be supported via intuitive software. The research indicates that optimal use of collaborative technology requires regular communication among team members and an interface that allows users to add, edit, and validate sources and communicates how the knowledge can be applied.

This source is valuable to this study as it examines collaborative technologies from a process modeling perspective and shows the cognitive processes of teams. These findings clarify what mechanisms are most valuable in using collaborative technologies.

Shen, X.L., Lee, M.K., & Cheung, C.M. (2012). Harnessing collective intelligence of Web 2.0: group adoption and use of Internet-based collaboration technologies. *Knowledge Management Research & Practice, 10*(4), 301-311. doi:10.1057/kmrp.2012.30

Abstract. Along with the advent of Web 2.0, mass collaboration is of paramount importance in knowledge exploration and diffusion. However, the extent to which Internet-based collaboration technologies can be used to develop new knowledge and to leverage the wisdom of crowds heavily depends on the collective willingness to adopt such tools together. In this study, the adoption and use of instant messaging has been conceptualized as a group-referent intentional social action. The concept of 'we-intention', which refers to one's perception of the group acting as a unit, is the focus of our interest. The cognitive, affective and social dimensions that contribute to 'we-intention' to adopt and use instant messaging were investigated. A survey was conducted and the findings provided empirical evidence supporting the idea that cognitive, affective and social factors jointly lead to the development of we-intention. This study is expected to provide some useful insights to both researchers and practitioners.

Summary. The authors, professors of information systems and business systems, build their research on the *Uses and Gratification paradigm* (U&G), which proposes that the inclusive tools of new media forms and collaborative technologies provide users with gratification. Their use creates positive associations with the tools and greater satisfaction amongst users. Forming a digital community, in which users can share knowledge and

utilize more resources to accomplish goals, reflects the social identity theory of an individual becoming more engaged and connected when they identify with a larger group. As communication is key for knowledge transfer, managers are advised to support integrating collaborative technologies into everyday business practices. This step is related to the theory of reasoned action in which team members' shared usage of a tool strengthens the ability for the members to collaborate and recognize the tool's value.

This source is useful for this study because it addresses the team management practices that support the use of and success with different technologies within nonprofit networks.

Conclusion

Nonprofit organizations face unique challenges and restrictions, requiring them to collaborate with government agencies, private sponsors, and other nonprofit groups to fulfill their missions (Austin & Seitanidi, 2012b). Nonprofits operate within nonprofit networks, depending upon interrelated knowledge and resources to fulfill independent goals (Atouba & Shumate, 2015; Grandgenett, Thiele, Pensabene, & Mcpeak, 2015). In order to facilitate collaboration, the sharing of information, and the removal of information silos, some nonprofits use collaborative technologies, with varying degrees of success (Grandgenett et al., 2015). The selected literature in this study addresses the research question of what collaborative technologies and related operational best practices enable nonprofit networks to work together and share knowledge in support of individual organizational goals.

The analysis of selected literature identifies challenges and opportunities for nonprofit networks to implement collaborative technologies. Sources in private and public groups are assessed to synthesize recommendations. Sources are identified and analyzed in the following three categories: (a) how nonprofits collaborate and common challenges; (b) collaborative technologies and associated network benefits; and (c) best practices for using collaborative technologies. The research concludes that networks that have strong communication practices and user-support for using collaborative technology are the most likely to successfully implement and use these resources, if the appropriate tools are considered and selected (Kolfschoten et al., 2012).

How nonprofits collaborate and common challenges

Networks of nonprofit organizations and their stakeholders, including board members, clients, government offices, private donors, and volunteers, regularly create informal resource sharing channels based on individual relationships between peers who can provide specific value

to partners (Austin & Seitanidi, 2012b; Zorn, et al., 2011). These communication patterns foster communication amongst pairs and small teams, but do not disseminate the knowledge found within these exchanges to benefit the group as a whole, or inherently create opportunities for colleagues to work collaboratively in remote environments (Keith, Demirkan & Goul, 2010; Austin & Seitanidi, 2012b). Efforts to adopt creative technologies can be derailed when users are intimidated by the technology, expectations for using the tools are not defined, and if there is a lack of support from leadership (Zorn et al., 2011).

Nonprofit networks can utilize a Collaborative Value Creation framework by formally committing to a partnership and shared goals (Austin & Seitanidi, 2012a). Nonprofit networks perform more efficiently when the group has strong communication that facilitates the sharing of resources to enable the network to meet collective objectives (Austin & Seitanidi, 2012a). Successful partnerships and projects require participants to agree to defined goals, roles, and responsibilities and provide economic, social, and environmental value (Austin & Seitanidi, 2012a). Stakeholder management processes within partnerships can benefit from technologies that build significant relationships and cultivate transactions that better serve clients (Keith et al., 2010).

Collaborative technologies and associated network benefits

Collaborative technologies enable team members to consult one another, perform operations remotely, and create innovation more efficiently than traditional office practices (Keith et al., 2010). Social-based collaborative technologies such as blogs, wikis, online forums, and digital conferencing support informal communication and knowledge acquisition and allow users to interact with one another outside the traditional office environment (Armstrong, 2013), facilitating an information-driven knowledge management (IDKM) framework (Bayrak, 2015).

Collaborative support systems (CSS) offer integrated services for group tasks and communication support to users in remote locations (Briggs et al., 2013). Types of applications include:

- Group support systems (GSS) that provide shared computing services to create computer and communication support for shared tasks (Briggs et al., 2013).
- Knowledge management software (KMS) that organizes, archives, and shares documents to facilitate a shared, living information database (Briggs et al., 2013).
- Process support applications (PSA) that contain tools for members to join design initiatives and improve processes (Briggs et al., 2013).

If collaborative technology can become ingrained within groups, teams are better able to manage stakeholders, monitor internal and external exchanges, and archive information (Bayrak, 2015). This allows team members to utilize enhance their advice networks by creating *distributed cognition*, in which knowledge from different users is available to the larger group (Bayrak, 2015; Keith et al., 2010). Collaborative technology has the potential to enhance non-profit networks if the right applications are identified for users based on goals, skill level, and projects (Keith et al., 2010).

Best practices for using collaborative technologies

Successful collaborative technology project managers involve key stakeholders in deciding system scope, requirements, and goals. This process increases the odds of selecting applications that work within the social structure of the network and are best able to enhance the groups' collaboration strengths and mitigate weaknesses (Briggs, 2006). Development is structured and the final project is cohesive with the organization's culture and work processes, allowing users to refine processes and support collective interests (Iverson & Burkart, 2007;

Recker et al., 2013). Researching software options and considering bids from multiple vendors allows the team to clarify expectations and better manage the scope and budget of implementations, while focusing on how the application design can improve existing work and communication processes (Briggs, 2006; Kolfschoten et al., 2012). The tools selected should include an intuitive interface that allows users to easily share, edit, and validate information with peers (Recker et al., 2013). Additionally, including communication tools such as video, audio, and/or text chat will better enable the team to build rapport (Shen, et al., 2012).

To facilitate the use of the collaborative technologies, teams should understand and endorse the goals of the software, have operating guidance and resources, and feel empowered to use the tools effectively (Kolfschoten et al., 2012). Managers and trainers should be aware of the different skills and comfort levels of users, and provide additional training support and encouragement for users who are intimidated by the new technologies (Finn, 2010). Collecting feedback from users, tracking and monitoring the progress towards achieving objectives, and offering regular technical support will better ensure that the collaborative technologies are used correctly (Kolfschoten et al., 2012). To sustain the use of the applications, the managers should also create opportunities for in-person engagement and communication to reinforce the bonds of the digital community and foster an environment that supports collaboration (Finn, 2010; Nath, 2011).

References

Armstrong, A. (2013). The digital toolbox: An introductory guide to collaboration technology. *Journal of Staff Development, 34*(1), 26-31. Retrieved from Google: http://learningforward.org/docs/default-source/jsd-february-2013/armstrong341.pdf?sfvrsn=2

Atouba, Y.C., & Shumate, M. (2015). International nonprofit collaboration. *Nonprofit and Voluntary Sector Quarterly, 44*(3), 587-608. doi:10.1177/0899764014524991

Austin, J. E., & Seitanidi, M. M. (2012a). Collaborative value creation: A review of partnering between nonprofits and businesses: Part I. Value creation spectrum and collaboration stages. *Nonprofit & Voluntary Sector Quarterly, 41*(5), 726-758. doi:10.1177/0899764012450777

Austin, J. E., & Seitanidi, M. M. (2012b). Collaborative value creation: A review of partnering between nonprofits and businesses. Part 2: Partnership processes and outcomes. *Nonprofit & Voluntary Sector Quarterly, 41*(6), 929-269. doi:10.1177/0899764012454685

Bayrak, T. (2015). Identifying collaborative technology impact areas. *Technology in Society, 42,* 93-103. doi:10.1016/j.techsoc.2015.04.001

Briggs, R.O. (2006). On theory-driven design and deployment of collaboration systems. *International Journal of Human-Computer Studies, 64*(7), 573-582. doi:10.1016/j.ijhcs.2006.02.003

Briggs, R.O., Kolfschoten, G.L., de Vreede, G.J., Lukosch, S. & Albrecht, C.C. (2013). Facilitator-in-a-box: Process support applications to help practitioners realize the

potential of collaboration technology. *Journal of Management Information Systems, 29*(4), 159-194. doi: 10.2753/MIS0742-1222290406

Bryson, J.M., Berry, F.S. & Yang, K. (2010). The state of public strategic management research: a selective literature review and set of future directions. *The American Review of Public Administration, 40*(5), 495-521. doi:10.1177/0275074010370361

Center for Public Issues Education. (2014). Evaluating information sources. Retrieved from http://www.piecenter.com/wp-content/uploads/2014/08/evaluateinfo.pdf

Finn, J. (2010). Collaborative knowledge construction in digital environments: Politics, policy, and communities. *Government Information Quarterly*, *28*(3), 409-415. doi: 10.1016/j.giq.2010.10.004

Grandgenett, N., Thiele, L., Pensabene, T., & Mcpeak, B. (2015). It takes a village to raise an information technology project: suggestions on collaboration from our 10 community-college consortium. *Community College Journal of Research and Practice*, *39*(7), 647-658. doi:10.1080/10668926.2014.883555

Iverson, J. & Burkart, P. (2007). Managing electronic documents and work flows: Enterprise content management at work in nonprofit organizations. *Nonprofit Management and Leadership*, *17*(4), 403-419. doi:10.1002/nml.160

Keith, M., Demirkan, H., & Goul, M. (2010). The influence of collaborative technology knowledge on advice network structures. *Decision Support Systems, 50*(1), 140-151. doi: 10.1016/j.dss.2010.07.010

Kolfschoten, G.L., Niederman, F., Briggs, R.O., & de Vreede, G.J. (2012). Facilitation roles and responsibilities for sustained collaboration support in organizations. *Journal of Management Information Systems*, *28*(4), 129-162. doi:10.2753/MIS0742-1222280406

Lagace, M. (2005, May 16). Nonprofit networking: the new way to grow. *Harvard Business School Working Knowledge*. Retrieved from Harvard Business School database: http://hbswk.hbs.edu/item/nonprofit-networking-the-new-way-to-grow

Moon, J., Choe, Y.C., Chung, M., Jung, G.H., & Swar, B. (2016). IT outsourcing success in the public sector. *Information Development*, *32*(2), 142-160. doi:10.1177/0266666914528930

Munkvold, B.E., & Zigurs, I. (2006). Collaboration technologies, tasks, and contexts: evolution and opportunity. In Gallett, D.F., & Zhang, Y. (Eds.), *Human-computer interaction and management information systems: Applications* (143-169). Abingdon, Oxfordshire: Routledge. Retrieved from Academia.edu: https://www.academia.edu/216665/Collaboration_Technologies_Tasks_and_Contexts_Evolution_and_Opportunity?auto=download

Nath, J. (2011). Reimagining government in the digital age. *National Civic Review*, *100*(3), 19-23. doi:10.1002/ncr.20070

Nevo, D., Benbasat, I. & Wand, Y. (2012). Understanding technology support for organizational transactive memory: Requirements, application, and customization. *Journal of Management Information Systems*. *28*(4), 69-98. doi:10.2753/MIS0742-1222280404

Nonprofit organization. (n.d.). In *Wikipedia*. Retrieved April 14, 2016 from https://en.wikipedia.org/wiki/Nonprofit_organization

Nutt, P.C. (1984). A strategic planning network for nonprofit organizations. *Strategic Management Journal*, *5*(1), 57-75. doi:10.1002/smj.4250050105

Recker, J., Mendling, J., & Hahn, C. (2013). How collaborative technology supports cognitive processes in collaborative process modeling: A capabilities-gains-outcome model. *Information Systems, 38*(8), 1031-1045. doi:10.1016/j.is.2013.04.001

Shen, X.L., Lee, M.K., & Cheung, C.M. (2012). Harnessing collective intelligence of Web 2.0: group adoption and use of Internet-based collaboration technologies. *Knowledge Management Research & Practice, 10*(4), 301-311.

Vaidya, S. & Seetharaman, P. (2011). Explaining sophistication in collaborative technology use: a context - technology fit perspective. *Group Decision and Negotiation, 20*(2), 185-213. doi:10.1007/s10726-009-9172-z

Zorn, T.E., Flanagin, A.J., & Shoham, M.D. (2011). Institutional and noninstitutional influences on information and communication technology adoption and use among nonprofit organizations. *Human Communication Research, 37*(1), 1-33. doi: 10.1111/j.1468-2958.2010.01387.x