NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

DEVELOPING HEALTHY ONLINE WORKPLACE COMMUNITIES: A PHASED EXPLORATION OF THE ANTECEDENTS OF DESTRUCTIVE AND CONSTRUCTIVE BEHAVIOR AND OUTCOMES

by

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December 2018

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REPORT DOCUMENTATION PAGE			*Form Approved OMB No. 0704-0188*

1. AGENCY USE ONLY *(Leave blank)*	**2. REPORT DATE** December 2018	**3. REPORT TYPE AND DATES COVERED** Master's thesis

4. TITLE AND SUBTITLE DEVELOPING HEALTHY ONLINE WORKPLACE COMMUNITIES: A PHASED EXPLORATION OF THE ANTECEDENTS OF DESTRUCTIVE AND CONSTRUCTIVE BEHAVIOR AND OUTCOMES	**5. FUNDING NUMBERS** WGSBP
6. AUTHOR(S) Philip F. Clark Jr. and Paul R. Henderson Sr.	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000	**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) 21st Century Sailor N17, Arlington, VA	**10. SPONSORING / MONITORING AGENCY REPORT NUMBER**

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.	**12b. DISTRIBUTION CODE** A

13. ABSTRACT (maximum 200 words)

Online communities have quickly gained prominence as a common use tool within enterprise workplace communities, including the Department of the Navy. Web 2.0 technologies have allowed social interactions to take place in virtually every aspect of our personal and professional lives. Despite the ubiquitous nature of social media use, research is limited that investigates the various aspects of healthy online interactions in the workplace. Drawing on the outcomes of an in-depth systematic meta-narrative literature review, our aim was to fill the gap by developing a conceptual framework that identifies several critical components. Together, these components characterize an online community: (1) social interactions, (2) information exchange, (3) and individual/organizational values. Furthermore, we identify themes associated with each component, which through management of activities, factors, and community characteristics can assist in the creation and maintenance of healthier online communities. This study aims to help the Navy better understand the characteristics of online communities, their components, and the contributing activities, factors, and attributes so that the Navy can better shape the overall health of online workplace communities.

14. SUBJECT TERMS healthy online communities, online workplace communities, destructive behavior, constructive behavior, online communities, social networks, virtual communities, online social networks	**15. NUMBER OF PAGES** 137
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	**18. SECURITY CLASSIFICATION OF THIS PAGE**	**19. SECURITY CLASSIFICATION OF ABSTRACT**	**20. LIMITATION OF ABSTRACT**
Unclassified	Unclassified	Unclassified	UU

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89) Prescribed by ANSI Std. 239-18

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MASTER OF BUSINESS ADMINISTRATION

from the

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ABSTRACT

Online communities have quickly gained prominence as a common use tool within enterprise workplace communities, including the Department of the Navy. Web 2.0 technologies have allowed social interactions to take place in virtually every aspect of our personal and professional lives. Despite the ubiquitous nature of social media use, research is limited that investigates the various aspects of healthy online interactions in the workplace. Drawing on the outcomes of an in-depth systematic meta-narrative literature review, our aim was to fill the gap by developing a conceptual framework that identifies several critical components. Together, these components characterize an online community: (1) social interactions, (2) information exchange, (3) and individual/organizational values. Furthermore, we identify themes associated with each component, which through management of activities, factors, and community characteristics can assist in the creation and maintenance of healthier online communities. This study aims to help the Navy better understand the characteristics of online communities, their components, and the contributing activities, factors, and attributes so that the Navy can better shape the overall health of online workplace communities.

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ACKNOWLEDGMENTS

I would like to thank my thesis advisors, Dr. Kathryn Aten and Dr. Gail Thomas, of the Graduate School of Business and Public Policy at Naval Postgraduate School (NPS). Their energy and interest in the subject matter was contagious and their around-the-clock guidance was invaluable. It was truly a pleasure to work with such dedicated academics.

I would like to thank my thesis processor, Ms. Rebecca Pieken, and the rest of the NPS Thesis Processing team. Rebecca and the team were accommodating, expeditious, and thorough in providing guidance and feedback. I still don't understand why they call them the Dragon Ladies as they were a consistent joy to work with.

I would also like to thank the fantastic network of friends and colleagues the Navy has brought into my life who have consistently supported my educational and career pursuits. I am especially grateful to those at NPS who were mindful enough to ensure recreational breaks were taken during this degree program when needed most.

Finally, I would like to express my sincere gratitude to my family and loved ones for providing the consistent source of support and encouragement which keeps me going on a daily basis.

- LCDR Philip F. Clark, Jr.

I would like to acknowledge several important people for their inspiration and knowledge. I would like to acknowledge my wonderful mother for her many words of encouragement throughout my life. She told me that I could accomplish anything I put my mind to and those words have stayed with me even though she is gone. I would like to acknowledge my wife for her understanding, patience, and for being source of strength when I needed it. I would especially like to thank Dr. Gail Thomas and Dr. Kathryn Aten for sharing their wealth of knowledge in support of our research.

- LT Paul R. Henderson, Sr.

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I. INTRODUCTION

Healthy online social media use has quickly gained prominence as a desired characteristic of enterprise online workplace communities. This is because the use of online communication technology, which once dominated our personal lives, is now also pervasive in the workplace (Lewis, Kaufman, & Christakis, 2008; Treem & Leonardi, 2013). Recent reports estimate that 77% of Americans (Statista, 2018) and almost 70% of organizations (Bughin, 2015) use participatory or social websites, often termed Web 2.0 (Techopedi, 2018). The features of such technology afford diverse and more extreme behaviors in comparison to face-to-face interactions (Bughin, 2015). Some social media interactions would possess unique benefits. A study found that 69% of business executives saw measurable increases in productivity after implementing Web 2.0 technology (Bughin, Chui, & Miller, 2009). Conversely, negative outcomes of social media use were also apparent as a consequence of harassment and bullying (Luna & Chou, 2013; Petersen, 2018).

The Navy is in a strong position to develop healthy online workplace communities. A majority of its workforce belongs to a generation that largely uses social media (Bughin, 2015; Office of the Under Secretary of Defense [OUSD], 2016; Smith & Anderson, 2018). In 2016, the OUSD reported that approximately 65% of the Navy's enlisted Sailors were 17–29 years old. Comparably, a study noted that 88% of 18–29-year old adults used some form of social media (Smith & Anderson, 2018). Since a substantial portion of the Navy's workforce uses social media, a significant opportunity is presented that will likely increase expectations and a need to manage its online workplace communities. The Navy's effort to manage its online workplace communities would affect not only the 430,086 service members but also the 270,265 civilian workers (United States Navy, 2018).

To date, the characteristics of healthy online workplace communities have not been widely studied (Treem & Leonardi, 2013). This research addresses this gap in the body of literature by presenting an in-depth, systematic literature review meant to identify the antecedents and consequences of both healthy and unhealthy online

workplace communities. In addition to its academic contribution, this study is meant to support the U.S. Navy's efforts in creating healthy online communities.

A. BACKGROUND

Online communication technologies in the workplaces have become ubiquitous. According to Bughin, Chui, and Harrysson's (2016) survey aimed at business executives, 93% are using at least one social technology, which is up from 82% in their last two surveys. Large organizations have even gone so far as to develop tailored proprietary or private versions of public social networking software (Sineriz, 2018). Web 2.0, also known as the "participatory web" and which began in the early 2000s, now exists in such forms as interactive workplace websites, blogs, Facebook-like apps, Twitter, LinkedIn, and messaging boards (Blank & Reisdorf, 2012).

While many definitions of enterprise social media exist, one of the most cited is Leonardi, Huysman, and Steinfield (2013):

> Web-based platforms that allow workers to (1) communicate messages with specific coworkers or broadcast messages to everyone in the organization; (2) explicitly indicate or implicitly reveal particular coworkers as communication partners; (3) post, edit, and sort text and files linked to themselves or others; and (4) view the messages, connections, text, and files communicated, posted, edited and sorted by anyone else in the organization at any time of their choosing. (p. 2)

1. Positive Organizational Outcomes

At their best, online communities can support positive outcomes. Some of the outcomes include effective teamwork, cross-functional collaboration, and improved access to management and other administrative roles. Employees often use online communities to give and receive social support. In these instances, if managed well, online communities have also been found to support an overall positive organizational climate and culture (Bughin et al., 2009; Cortico, 2018). In addition to intra-organizational benefits, they also support establishing and maintaining relationships with external stakeholders that are vital to the workplace and for organizational successes (Daft & Marcic, 2004). In short, the positive organizational outcomes are numerous, but they are not achieved effortlessly.

2. Negative Organizational Outcomes

On the other end of the spectrum are negative online communities. These types of communities may be the unintended consequences of minimal online community guidance and control. Moderated or not, unhealthy online communities can lead to undesirable workplace and organizational outcomes. Studies showed that unprofessional or all-out rude behavior by online users resulted in distrust, low morale, and poor performance (Luna & Chou, 2013; Petersen, 2018; Rosnow, 1977). When an unhealthy online environment is sustained for any length of time, it can effectively handicap organizational processes, products, and services. Therefore, leaders are needed to play a dominant role in managing the processes of identifying inappropriate conduct, measuring the pervasiveness of undesirable behavior, implementing mechanisms and actions for correcting behaviors, and continuously looking to improve and control online workplace communities through monitoring.

3. U.S. Navy Examples

We have limited knowledge of online workplace communities in the Navy, but two examples have been provided to illustrate the extremes—positive and negative—of online workplace community outcomes. As discussed, healthy online workplace communities have some distinctive qualities. Chief among them are to promote positive support. For example, in 2012, the Navy created the U.S. Navy's Office of Women's Policy (OWP) group, a Facebook community that was designed primarily to make policy related to women more available to all women in the Navy (Allert, 2015). The community also afforded members the opportunity to network, share ideas and experiences, and mentor one another (Allert, 2015). An aspect that made OWP group healthy was the considerable effort community managers committed to mentor and respond to member concerns for providing the best outcomes possible.

Alternatively, unhealthy online communities exhibit outcomes that are indicative of the negative interactions taking place within the communities themselves. For instance, in 2015, a Facebook group called Marines United was created. According to Jason Lutcavage, the founder of the online group, its purpose was to make online support

available to active duty service members and veterans. Unfortunately, communications within the group projected feelings and beliefs that contradicted this mission. Over time, the site became filled with unflattering comments and content meant to demean and bully others, such as jokes about rape, racism, and revenge porn (Keller, 2017). Eventually, the negative communications that occurred in this private site were reported to Marine Corps leaders and led to punitive action. As of March 1, 2018, seven Marines were court martialed, 14 received non-judicial punishment, six were administratively separated, and 28 were subjected to adverse administrative action. Of the 119 individuals identified in the investigations, 97 of them were Marines (Snow, 2018).

There are features of online communication platforms that make conveying information and its meaning possible. Although important to our discussion, they are merely instruments. We discussed examples, generally and specific to the Navy, that attest that communicated information can be both positive and negative and associated with individual and organizational outcomes. Based on this rationale, online workplace communities represent managerial and leadership opportunities to positively affect organizational processes and outcomes through the promotion of characteristics or principles of healthy communities.

B. PURPOSE

Our study of healthy online workplace communities has been conducted in response to a request from the Navy's 21 Century Sailor (N17) office. This office provides a host of services to support active duty service members and their families through difficult times. It promotes resiliency through collaboration that is meant to strengthen the Navy's total force. This office has undertaken a large-scale personnel transformative initiative that will impact approximately 700,351 service members and civilian employees located across the globe. The initiative involves creating, maintaining, and improving online workplace communities that promote healthy online communications. This study furthers that goal by examining the characteristics of online communities and distinguishing, from among them, the attributes that promote health.

We are hopeful that our research will support the Navy's efforts in creating a more productive workforce and mission completions that rival prior success.

C. AIM OF THIS STUDY

To lay the groundwork for future empirical work about Navy online communities, our aim is to build a conceptual framework derived from the extant literature on healthy online communities. To do that, we chose to conduct a meta-narrative literature review that allowed for a systematic and methodical approach to analyzing the existing research on this topic.

D. RESEARCH QUESTIONS

Our study was guided by these four research questions. The following were the primary questions that informed our literature search:

1. What characteristics and behaviors contribute to healthy online workplace communities?

2. What are the potential community, organizational, and individual consequences of such behaviors?

3. What levers can the Navy employ to build healthy online communities?

4. How can the Navy use online communities to support overall wellbeing and community health?

E. ORGANIZATION OF THESIS

This study is organized as follows:

- Chapter II: The methods chapter describes a step-by-step approach to our meta-narrative, including the rationale for our selection of articles, as well the process we used to derive our themes and conceptual model.

- Chapter III: The descriptive analysis chapter presents the characteristics of the data set at key stages during the process.

- Chapter IV: The findings chapter discusses the interactions among components of online communities.
- Chapter V: The final chapter concludes our study by answering our research questions, addressing the implications of the study, providing recommendations, discussing the limitations of the study, and offering suggestions for future research.

II. METHODS

This chapter presents our approach to our literature review: the systematic meta-narrative literature review. A systematic meta-narrative review is a way to systematically analyze a body of literature where various researchers have approached the same topic in different ways (Greenhalgh et al., 2005). It includes six phases: planning, searching, mapping, appraisal, synthesis, and recommendations. This chapter outlines our procedures for the first five phases.

A. PLANNING

The planning phase of a systematic meta-narrative review includes two steps. The planning phase serves to (1) focus the research questions and (2) assess the suitability of the method.

1. Research Questions

Due to the rapidly increasing portion of Navy Sailors who are considered digital natives and the occurrence of several recent events involving online interactions that resulted in less than desirable outcomes, the Navy initiated a study to understand how organizations can create healthy online communities and to understand the links between the antecedents of destructive and constructive behavior within these communities. This led to our primary research task of determining what characterizes healthy online workplace communities. The following questions guided our research:

1. What characteristics and behaviors contribute to healthy online workplace communities?

2. What are the potential community, organizational, and individual consequences of such behaviors?

3. What levers can the Navy employ to build healthy online communities?

4. How can the Navy use online communities to support overall wellbeing and community health?

Our primary research question, "What characterizes healthy online workplace communities?," guided our initial literature search, while the additional questions guided the synthesis phase of the study.

2. Systematic Meta-Narrative Analysis

The meta-narrative approach is suitable for a synthesis of studies conducted from diverse research paradigms, as is the case in the subject area of online communities (Barnett-Page & Thomas, 2009; Greenhalgh et al., 2005). Researchers in the online community domain have conducted studies in diverse contexts and within multiple paradigms. For example, recent contexts include movie recommendation communities (Fugelstad et al., 2012), online gaming environments (Cole & Griffiths, 2007; Vella, Johnson, & Mitchell, 2016), community blogs (Silva, Goel, & Mousavidin, 2009), social networking sites (Almakky, 2017; Vella, Johnson, & Mitchell, 2016), multinational companies (Ehrlich, Muller, Matthews, Guy, & Ronen, 2014; Muller et al., 2012), smoking cessation communities, and auto enthusiast forums (Ma & Agarwal, 2007). Given the rapidly changing nature of technology and the relatively recent emergence of online communities, much of the research on the subject has been exploratory. Extant research does, however, include qualitative, quantitative, and mixed-method approaches, which adopt diverse paradigms. A systematic meta-narrative review is, thus, an appropriate approach for our study.

B. SELECTION OF STUDIES: SEARCHING AND MAPPING

The selection of studies phase consists of two steps, searching and mapping. First researchers search to locate the existing body of knowledge surrounding a topic. Then they identify key elements to map the body of knowledge.

1. Searching

The purpose of the search phase is to identify studies including diverse perspectives surrounding the study topic (Greenhalgh et al., 2005). We conducted an advanced search for articles with the exact phrase "healthy online communities" anywhere in the article. This yielded 37 articles.

After reviewing the descriptions and summaries of the 37 articles, we identified 21 articles that directly addressed the overall topic of this literature review: individual and organizational constructive and destructive behavior and outcomes, as well as their antecedents. We then reviewed the abstracts of the 21 sources and determined that 15 were directly related to the primary and secondary research questions.

After that, we continued the literature search using a snowball search strategy, in which one source of information leads to additional sources by referrals (Noy, 2008). We reviewed the references of each of the 15 sources and identified titles that indicated studies that might contain information related to constructive and destructive behavior and outcomes, as well as their antecedents related to online communities. In some cases, we located additional references from the first snowball references. This snowball search resulted in a final set of 71 articles.

2. Mapping

The intent of the mapping phase is to identify the key elements, actors, events, and prevailing language for a given topic (Greenhalgh et al., 2005). To perform the mapping phase, we printed abstracts for each of the 71 articles in the set. We sorted articles into groups based on the type of information the abstract claimed the study provided. We grouped articles discussing similar subjects, yet remained open to creating new categories if an article did not fit into one of the categories already available. We discussed any discrepancies until we reached agreement on the categorization.

Table 1 lists the eight meta-narrative categories that we identified and the number of references in each category. Three of the references were sorted into two different meta-narrative categories because they appeared to provide valuable insight to multiple meta-narratives. This explains why the total reference count in Table 1 is 74 compared to the 71 articles in the data set.

Table 1. Research Topic Categories

Meta-Narrative Categories	References
Designing Online Communities	28
User Perceptions	11
Online Community Commitment & Motivation	9
Online Community Obstacles & Challenges	6
Online User Personalities	6
Role of Influence	5
Online Community Success Drivers	5
Defining Online Communities	4

C. ANALYSIS APPROACH: SYSTEMATIC APPRAISAL AND SYNTHESIS

Our analysis includes two phases of the meta-narrative approach: appraisal and synthesis. Appraisal involves assessing articles to determine their suitability for use in the study. Synthesis consists of identifying the key themes revealed through the analysis.

1. Appraisal of Articles

Assessment of articles is important prior to incorporation in a literature review. After numbering each article, we conducted our article assessment by creating a table showing the meta-narrative category, year, citation, abstract, journal/publisher, publication type (peer-reviewed journal, thesis, conference proceedings, etc.), and article type (empirical, conceptual, literature review, etc.), as shown in Figure 1. Additionally, we included in the table the question/problem/purpose, method, data source, sample size, population/setting, findings, and key words, as shown in Figure 2. Once the table was populated, we collaboratively identified which of the five research questions each article addressed. If the article partially addressed a research question or answered multiple questions, we annotated it as such, thereby allowing us to sort the table by research question.

#	Initial Meta-Narrative Categor	Ye	Cite	Abstract	Journal/Publisher	Publication Type	Article type
1	Role of Influence	2008	Adamic, L. A., Zhang, J., Bakshy, E., & Ackerman, M. S. (2008). Knowledge Sharing and Yahoo Answers: Everyone	Yahoo Answers (YA) is a large and diverse question-answer forum, acting not only as a medium for sharing technical knowledge,	ACM Press	Published conference proceeding	Empirical I think
2	Designing Online Communities	2017	Almakky, H. G. A. (2017). Facebook User Interface Design to Suit the Saudi Arabian Culture (Thesis). Bournemouth University.	Culture affects the preferences of users and their expectations of the elements found in	Bournemouth University	PhD Thesis	Empirical
3	Online Community Commitment & Motivat	2017	Althoff, T., Jindal, P., & Leskovec, J. (2017). Online Actions with Offline Impact: How Online Social Networks Influence Online and	Many of today's most widely used computing applications utilize socialnetworking features and allow users to connect, follow	Proceedings of the Tenth ACM International Conference on Web Search and Data Mining	Published conference proceeding	Mixed
4	Designing Online Communities	2012	Amado, P., & Veloso, A. (2012). Participatory Design of an Online Community: A Virtual Community of	Given the rise of the importance of the Online Communities' role in the production and consumption of different	University of Aveiro	Poster/ Ongoing PhD research	Empirical
5	Designing Online Communities	2002	Andrews, D. C. (2002). Audience-specific online community design. Communications of the ACM, 45(4), 64-68.	The article focuses on audience-specific online community design. Community is no longer defined as a physical place, but	Communications of the ACM	PRJ	Conceptual
6	User Perceptions / Online Community Obstacles & Challenges	2003	Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing	This paper reports the results of aqualitative study of motivation and barriers to employee participation in virtual	Journal of Knowledge Management	PRJ	Empirical
7	User Perceptions	2004	Augeung, L. H. (2004). Building a Collaborative Online Learning Community: A Case Study in Hong	This article reports on how a social sciences instructor teaching contemporary global issues implemented collaborative learning among	Journal of Educational Computing	PRJ	Empirical
8	Online Community Obstacles & Challenges	2002	Baker, B. B., Dickson, M. W., Sherman, M. P., Bravo, C. C., & LoGuidice, J. S. (2002). Computer-Mediated Communication and	A meta-analysis of research comparing decision making in Face-to-face versus computer-mediated	Organizational Behavior and Human Decision Processes	PRJ	Literature Review
9	Designing Online Communities	2001	Bereiter, S. A., McCalla, J. G., Moore, J. A., & Cunningham, D. J. (2001). Designing and building an on-line community: The struggle	In this paper we describe the sociotechnical structures of the Inquiry Learning Forum (ILF), a Web-based	Educational Technology, Research and Development	PRJ	Conceptual
10	Online Community Commitment & Motivat	2011	Bateman, P. J., Gray, P. H., & Butler, B. S. (2011). The Impact of Community Commitment on Participation in Online	Online discussion communities have become a widely used medium for interaction, enabling conversations across a broad range of topics	Information Systems Research	PRJ	Empirical

Figure 1. Article Analysis Table (Article #–Article Type)

Question/Problem/Purpose	Method	Data source	Sample Size	Population/Setting	Findings	Keywords
What arethe content characteristics and patterns of interaction among users that influence knowledge sharing	Regression: network and non-network analysis	Yahoo Answers forum categories	?	Yahoo Answers forums	We find that having lower entropy, or equivalently, higher focus, correlates with the proportion of	Online communities, question answering, social network analysis, expertise finding, help seeking, knowledge
How does the misalignment between the original user interface of Facebook (development in the USA) and its Arabic	Interpretivist research	Focus Group Interviews and 2 sequential questionnaires	9	Saudi Facebook participants between the ages of 24 and 34 and chosen from those studying English as a second language at	This research illustrates that the Facebook user interface has some contradictions with	
How social do networks influence user behavior in a physical activity tracking application?	We employ natural experiments, difference-in-difference models, and matching-based observational studies to disentangle	They used the Argus smartphone app by Azumio which allows users to track their daily activities.	We used a dataset of 6 million individuals from over 100 different countries.	Smart phone user on an app develop by Argus	Specifically, we establish a causal effect of how social networks influence user behavior. We show	
two main objectives: i) to identify the CMC (Computer Mediated Communication) modes	Regression	user entries	30 from each Creative Online Communities	entries from 4 Creative Online Communities	When conceptualizing an OC for visual creation, the analysis of the COC sample revealed that the implementation of	
Identification of online community design approach for specific audiences	?	?	N/A	N/A	A thorough understanding of an audiences distinctive demographic, psychodemographic, and	Computer networks; Social networks; Commercial associations; Nonprofit organizations; Customer relations; Online
(1) What are the reasons for employees' willingness to contribute their knowledge to virtual knowledge-sharing communities	The major method of data collection was based on semi-structured interviews. In addition, the researchers have collected a	Survey	30	Interviews were conducted with a total of 30 members, including managers of three communities, community experts,	The study indicates that, when employees view knowledge as a public good belonging to the whole	N/A
This "entrenched practice of unilateral instruction," as described in the consultative paper on education reform	This article reports on a single case study, a descriptive and evaluative examination of a unique instance concerning how the	The bulletin board feature of WebCT was used to implement a simulation game where students role-played different	400	Online discussion	By partaking in a dialogue, students can develop and sharpen their reasoning skills. It is therefore essential to engage students	
To better understand the extant literature, we conducted a meta-analysis in an attempt to quantify	Computer-based literature searches were conducted on Psychological Abstracts (PsycLit, 1887 to August 2000),	ABI/INFORM (1977 to August 2000), Business Periodicals Index (1977 to August 2000), and Dissertation Abstracts	35 articles	Online databases	Results suggest that computer-mediated communication leads to decreases in group effectiveness, increases in time	
The goal of this paper is to share how we instantiated our pedagogical commitments and to describe the	Case Analysis	User Cases	3	Inquiry Learning Forum (ILF) members	In this paper we have described the sociotechnical structures of our on-line professional development environment	N/A
"Why, then, would individual choose to return repeatedly to a particular community and engage in the various behaviors that	Data for testing our research model were collected at BroadForum (a pseudonym), an online discussion community that had	BroadForm respondents to complete a survey.	192	A total of 741 members accessed the survey site, meaning that at least 23.3% of those who viewed the invitation clicked	Our results indicate that each form of community commitment has a unique impact on each behavior, with need-based	Community involvement Electronic discussion groups Online social networks

Figure 2. Article Analysis Table (Question/Problem/Purpose–Keywords)

We eliminated from the review any articles that were not relevant to at least one of our primary or secondary research questions (24 articles). We categorized the remaining articles into four groups:

1. Empirical studies, case studies, or mixed method studies written in peer-reviewed journals.

2. Conceptual papers, informative articles, and literature reviews written in peer-reviewed journals.

3. Empirical studies, case studies, or mixed method studies not written in peer-reviewed journals.

4. Conceptual papers, informative articles, and literature reviews not written in peer-reviewed journals.

We then evaluated each primary and secondary research question to ensure that the remaining articles were represented by the four previous categories to ensure substantial content existed to answer primary and secondary research questions.

2. Synthesis

The intent of the synthesis phase is to determine the key themes present in the data. To accomplish this phase, we conducted a detailed review of all articles identified for incorporation in the appraisal phase and identified themes relevant to each of the primary and secondary research questions. We created a table illustrating the articles coded by article number, research question, and theme, as shown in Figure 3.

Article	Question1: What characteristics and behaviors contribute to healthy online workplace communities?	Question 2: What are the potential community, organizational, and individual consequences of such behaviors?	Question 3: What levers can the Navy employ to build healthy online communities?	Question 4: How can the Navy use online communities to support overall wellbeing and community health?
2		Not designing for the user (in this article's case the Saudi's use of facebook), some may get used to the errors in design while others avoid use altogether.		
6			At Caterpillar, the desire to share/contribute was credited to the culture of the organization, which encouraged "mutually supportive relationships between employees."	
1	Factual information exchange is illuded to as being desireable in Yahoo Answers forum, however, those which are valued are not always factual as other factors are at play.			
6			Maintaining use of historical tecqniques for knowledge sharing for purposes of classified files is important. Users can provide info requested outside knowledge sharing online community while still providing answer.	
17	Use of emotionally supportive language within the group			
17				Sharing knowledge, resources, information, stories, best practices
17				Meaningful professional development
3		The social influence prompted by making friends within the physical activity social network suggests exposure to the activity of others increases ones own activity level. Article suggests stronger ties between members => higher potential for social influence.		
17				Technical benefits (instant access to colleagues and resources outside workplace)
24			Personalized community interface: organizations can identify features within a site (DESIGN) that will appeal to the desired audiences motivations for participation and retention. Communities can seek out individuals with behavioral histories that will enhance the community through participation and activities.	
26				Participation in online communities of practice can be a tool for informal learning
26				Reduce isolation related to job function or geographical location
26				Enculturation of newcomers (orientation and support)
37		Suicides after experiencing cyber bullying		
37		Feeling a need to be "always on" (Turkle) due to the appearance that others appear to have perfect lives.		
41	Privacy settings; rapid growth of contemporary social network sites			

Figure 3. Article Data Coding Table

After coding the articles, we printed the tables, cut them into slips with the codes and themes, and sorted the slips into groups based on which of our research questions they answered, as shown in Figure 4.

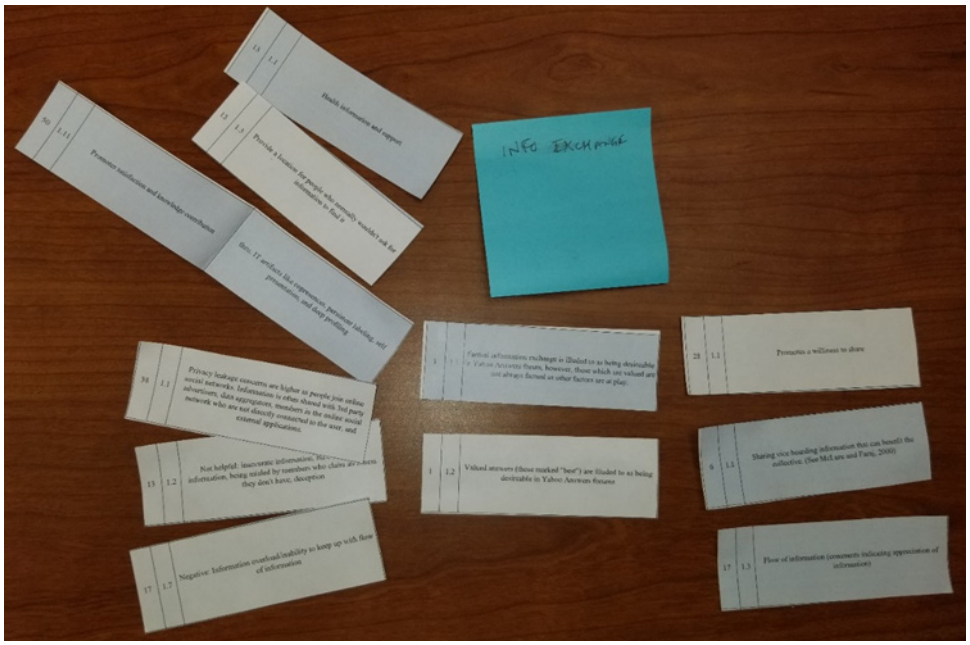

Figure 4. Themes Related to Information Exchange

Once organized by research question, we sifted through themes related to the primary research question and identified links between themes, as shown in Figure 5.

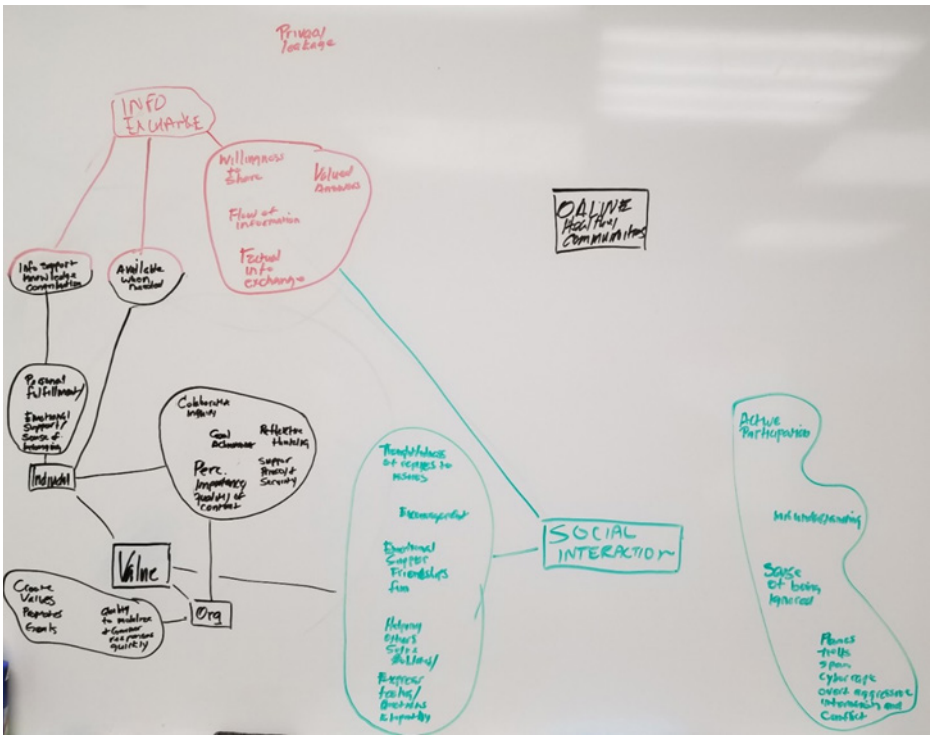

Figure 5. White Board Showing Overarching Themes of Healthy Online Communities

This resulted in three overarching categories, or factors, which constitute the character of online communities.

We used the same process with the themes coded under the second research question and uncovered three overarching factors that contribute to the construction and maintenance of online communities. We categorized themes from the third question into consequences from the perspective of the individual, group, and organization. The remaining themes, supporting our fourth and fifth research questions, were categorized into risks and resources associated with organizational use of online communities and examples of ways in which organizations have benefitted from using online communities.

The final phase of the systematic meta-narrative review, recommendations, involves reflection on the themes uncovered during the synthesis phase. In Chapter IV: Findings, we reflect on these themes and summarize the overall messages as they presented themselves. The following chapter closes the loop on the meta-narrative review process by discussing recommendations for organizations to use in applying this knowledge.

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III. DESCRIPTIVE ANALYSIS OF THE LITERATURE

This study is a systematic review of the literature informing an understanding of healthy online communities. We adopted a meta-narrative systematic approach to search, map, appraise, and synthesize extant literature related to our topic. Chapter II describes the systematic meta-narrative method, including the steps to identify the studies we included in the literature data set. This chapter describes the characteristics of our literature data set and is divided into two sections that describe (a) the initial data set that followed from our preliminary literature search, and (b) the focused data set that resulted from our first phase of analysis.

A. INITIAL DATASET—ARTICLE ANALYSIS DESCRIPTION

The initial dataset, which was the result of our preliminary literature search, yielded 71 articles. The publication year of these articles ranged from 2000 to 2018. As shown in Table 2, the greatest number of articles per year were 2007, 2014, and 2012, with eight, seven, and six articles respectively. Only one article was published in 2015 and one in 2018; however, we conducted our search partway through 2018. Based on our dataset, the online community area of study experienced growth from 2002 to 2014, averaging an increase of 0.2602 articles more per year. A broader 2000 to 2018 picture presents a relatively stable area of study with a milder increase of only 0.0439 articles more per year.

Table 2. Articles by Publication Year—Initial Dataset

Publication Year	# of Articles
2018	1
2017	4
2016	3
2015	1
2014	7
2013	5
2012	6
2011	5
2010	5
2009	3
2008	3
2007	8
2006	3
2005	3
2004	5
2003	3
2002	2
2001	2
2000	2

Of the 71 articles in the initial dataset, 55% were empirical studies (39 articles) and 17% were conceptual papers (12 articles). While 59% of the articles were published in peer-reviewed journals, only 27% of the articles were empirical studies published in peer-reviewed journals (19 articles). The second largest grouping, making up 21% of the dataset, was empirical studies from published conference proceedings (15 articles). The third largest grouping, making up 14% of the dataset, was conceptual papers published in peer-reviewed journals. Table 3 and Table 4 identify the number of articles from the initial search by each research approach and publication type. They show that the preponderance of articles are empirical studies presented in peer-reviewed journals and at conferences.

Table 3. Articles by Research Approach—Initial Dataset

Research Approach	# of Articles
Empirical	39
Conceptual	12
Other	8
Mixed Method	7
Literature Review	3
Case Study	2

Table 4. Articles by Publication Type—Initial Dataset

Publication Type	# of Articles
Peer-Reviewed Journal	42
Published Conference Proceeding	18
eBook	3
Master's Thesis	2
Book	1
EdD Thesis	1
Ubibook	1
PhD Thesis	1
Poster/Ongoing PhD Research	1
Research Database	1

The 71 articles from the initial search came from a variety of sources. The most common source, representing 32% of the articles and potentially indicating leadership within the field of online community research, was the Association for Computing Machinery (ACM) with 23 of 71 articles. Additional multi-article sources include the *Journal of Computer-Mediated Communication, CyberPsychology & Behavior, Information Society, Information Systems Research,* InterAcademic Press*, and User Modeling & User-Adapted Interaction.* Several other publication sources include universities, conferences on system sciences, web search and data mining, and journals in the fields of education, management, and computing. Table 5 provides a full list of

journals and publishers in the initial dataset. The listing shows that while ACM is the main publisher in the online community field, there is a wide range of journals, institutions, and conferences having the online community conversation.

Table 5. Articles by Journal/Publisher—Initial Dataset

Journal/Publisher	# of Articles
ACM Press	12
Communications of the ACM	4
Journal of Computer-Mediated Communication	4
ACM	3
ACM Transactions on Computer-Human Interaction	2
CyberPsychology & Behavior	2
Information Society	2
Information Systems Research	2
InterAcademic Press	2
User Modeling & User-Adapted Interaction	2
40th Annual Hawaii International Conference on System Sciences	1
5th IEEE International Conference on Digital Ecosystems and Technologies	1
ACM Computing Surveys	1
Ass. Advancement Artificial Intelligence	1
BCS Learning and Development Ltd.	1
Bournemouth University	1
California State University, Long Beach	1
Educational Technology, Research and Development	1
E-Service Journal	1
Hawaii International Conference on System Sciences	1
Identity in the Information Society	1
IEEE	1
IGI Global	1
Informatik, RWTH-Aachen	1
Information Systems Journal	1
Information Today, Inc.	1
Journal of Distance Education	1
Journal of Educational Computing	1
Journal of Educational Computing Research	1

Journal/Publisher	# of Articles
Journal of Enterprise Information Management	1
Journal of Knowledge Management	1
Journal of Organizational Change Management; Bradford	1
Journal of the American Society for Information Science & Technology	1
Journal of the Association for Information Science & Technology	1
Organizational Behavior and Human Decision Processes	1
Proceedings of the 37th Annual Hawaii International Conference on System Sciences	1
Proceedings of the 38th Annual Hawaii International Conference on System Sciences	1
Proceedings of the Tenth ACM International Conference on Web Search and Data Mining	1
ProQuest Dissertations & Theses Global	1
Springer International Publishing	1
SSRN	1
The International Journal of Urban and Regional Research	1
University of Aveiro	1
University of Technology Sydney	1
University of the West of England, Bristol, UK	1
Yale Journal of Law and Technology	1

B. POST APPRAISAL AND SYNTHESIS—DATASET DESCRIPTION

We narrowed the data set to include only those articles relevant to our research questions as described in Chapter II: Methods. The subsequent section describes the 47 articles assessed as potentially relevant during article assessment and the final 29 articles included in the focused dataset.

First, we sorted the final set of 47 articles into four categories:

1. Empirical studies, case studies, or mixed method studies written in peer-reviewed journals.

2. Conceptual papers, informative articles, and literature reviews written in peer-reviewed journals.

3. Empirical studies, case studies, or mixed method studies not written in peer-reviewed journals.

4. Conceptual papers, informative articles, and literature reviews not written in peer-reviewed journals.

We then evaluated the categorized articles to assess whether the articles included findings that could address the following research questions:

1. What characteristics and behaviors contribute to healthy online workplace communities?

2. What are the potential community, organizational, and individual consequences of such behaviors?

3. What levers can the Navy employ to build healthy online communities?

4. How can the Navy use online communities to support overall wellbeing and community health?

Figure 6 shows each of the 47 articles categorized into the four types of studies and related to the six research questions.

		Initial Articles Per Research Question				Total Articles
		RQ #1	RQ #2	RQ #3	RQ #4	
Peer Reviewed Journals	Empirical Study	9	2	2	3	11
	Case Study	2	-	-	-	2
	Mixed Method	5	-	1	-	6
	Conceptual Papers	2	1	2	-	5
	Informative Articles	1	-	-	-	1
	Literature Reviews	1	-	-	-	1
Other than Peer Reviewed Journals	Empirical Study	6	5	2	4	16
	Case Study	-	-	-	-	-
	Mixed Method	2	2	1	-	2
	Conceptual Papers	-	1	-	-	1
	Informative Articles	2	-	-	-	1
	Literature Reviews	1	-	-	-	1
Totals:		31	11	8	7	47

Figure 6. Initial Categorization by Article Type and Question

We then closely read each of the 47 articles, further reducing the dataset to 29 articles that were most relevant to the research questions. One example of an article excluded was Goyal et al.'s (2010) "Learning Influence Probabilities in Social Networks," which linked user actions to influence within the Flickr social network. On initial review, we expected the article to enlighten the organizational consequences of healthy and unhealthy behavior conversation associated with research question 3, but instead found the article revealed little about consequences of behavior and focused more on predictions of individual user influenceability. Another example was Matthews and Stephens (2010) published conference paper entitled "Sociable Knowledge Sharing Online: Philosophy, Patterns and Intervention," which looked at the social-cognitive and emotional aspects of in web-based knowledge exchange social venues. On initial review,

we expected the article to illuminate the discussion around research questions 1 and 2 by providing characteristics of healthy online communities and potentially antecedents to those behaviors, but upon further review we found the article had no real findings to report at all. Figure 7 displays the final 29 articles categorized by type of article and relationship to each of the research questions.

		Articles Per Research Question				Total
		RQ #1	RQ #2	RQ #3	RQ #4	Articles
Peer Reviewed Journals	Empirical Study	8	1	2	1	8
	Case Study	-	-	-	-	-
	Mixed Method	5	2	-	-	4
	Conceptual Papers	1	-	-	-	1
	Informative Articles	-	1	1	-	1
	Literature Reviews	2	-	-	-	1
Other than Peer Reviewed Journals	Empirical Study	16	1	1	1	12
	Case Study	-	-	-	-	-
	Mixed Method	2	2	-	-	2
	Conceptual Papers	-	-	-	-	-
	Informative Articles	-	-	-	-	-
	Literature Reviews	-	-	-	-	-
Totals:		34	7	4	2	29

Figure 7. Categorization of Final Data Set by Article Type and Research Question

Of the 29 articles, five articles were published from various universities including one master's thesis, two doctoral theses, a research database, and a poster, which was produced during ongoing PhD research. The majority of the articles (52%) were

published in peer-reviewed journals (15 articles), and 31% were published as conference proceedings (nine articles) as shown in Table 6.

Table 6. Articles by Publication Type—Final Dataset

Publication Type	# of Articles
Peer-Reviewed Journal	15
Published Conference Proceeding	9
Master's Thesis	1
EdD Thesis	1
PhD Thesis	1
Poster/Ongoing PhD Research	1
Research Database	1

The published conference proceedings were all either qualitative or quantitative empirical articles with the exception of one mixed-method empirical study. The peer-reviewed journal articles were a mix of all research approaches, as listed in Table 7.

Table 7. Articles by Research Approach—Final Dataset

Research Approach	# of Articles
Empirical	20
Mixed Method	6
Conceptual	1
Other	1
Literature Review	1

Somewhat consistent with the initial dataset, the years with the greatest number of articles were 2014 (four articles) and 2015 (five articles). Table 8 shows the number of articles included in the final dataset by publication year. Relevant articles were published every year from 2003 to 2018.

Table 8. Articles by Publication Year—Final Dataset

Publication Year	# of Articles
2018	1
2017	2
2016	1
2015	1
2014	4
2013	1
2012	5
2011	1
2010	2
2009	2
2008	3
2007	1
2006	1
2005	1
2004	2
2003	1

Table 9 lists the journal/publisher of the articles included in the final data set.

Table 9. Articles by Journal/Publisher—Final Dataset

Journal/Publisher	# of Articles
ACM Press	6
ACM	2
Information Systems Research	2
Journal of Computer-Mediated Communication	2
ACM Computing Surveys	1
ACM Transactions on Computer-Human Interaction	1
Ass. Advancement Artificial Intelligence	1
Bournemouth University	1
IEEE	1
Informatik, RWTH-Aachen	1
Information Systems Journal	1

Journal/Publisher	# of Articles
Journal of Distance Education	1
Journal of Enterprise Information Management	1
Journal of Knowledge Management	1
Proceedings of the 38th Annual Hawaii International Conference on System Sciences	1
Proceedings of the Tenth ACM International Conference on Web Search and Data Mining	1
ProQuest Dissertations & Theses Global	1
SSRN	1
University of Aveiro	1
University of Technology Sydney	1
Yale Journal of Law and Technology	1

The focus of the research covered a wide range of topics within the field of online community research. Ten articles focused on social media platforms including Twitter, MySpace, and Facebook. Evaluations of these platforms were conducted across demographics and environments, including Facebook use in Saudi Arabia, New York City, and among college students, and K–12 teacher use of Twitter for professional development. Five articles researched information sources where the users create and/or edit the content, including Yahoo Answers, MovieLens, Wikipedia, and Everything2.

Five articles researched enterprise communities including online communities within multinational organizations Caterpillar Inc. and IBM, in addition to smaller organizational groups like the Coordinators working for Alberta Community Adult Learning Council.

Five articles researched varying community types including health discussion communities, addiction recovery groups, car enthusiast groups, creative communities, and knowledge-sharing communities. Two articles studied blogs. One investigated smartphone apps, and another focused on community design.

The descriptive analysis of the final dataset shows inclusion of a consistent, yet increasing, number of empirical studies over the last 16 years. The range of topics and

publication sources is an indication that the dataset is representative of more than a limited subset of knowledge within the online community field. It appears as if this body of literature is still in its infancy, and there is much still to be discovered.

While this field appears to be emerging, we were able to gather enough data from the extant body of knowledge to identify three main components that contribute to healthy online communities. In our next chapter, we present these components along with themes to support them. Additionally, we were able to show activities, factors, and attributes that may aid in creating and maintaining healthy online communities for the future.

IV. FINDINGS

Our analysis of the literature identified three components that characterize an online community: social interactions, information exchange, and activities, factors, and attributes that characterize these components. Each of these components contributes to online community health. We further identified three overarching action areas that contribute to the building and maintaining of healthy online communities: user motivation, role of the moderator, and community characteristics. Our findings suggest that these action areas provide levers that organizations can use to support online community health.

This chapter provides a detailed discussion of the three components and the activities, factors, and attributes that contribute to community health. This chapter also discusses the online community health action areas and identifies relationships among the activities, factors, and attributes.

A. COMPONENTS OF ONLINE COMMUNITIES

Our synthesis of the literature shows that the character of online communities is can be categorized into three components: (1) Social Interactions, (2) Information Exchange, and (3) Individual/Organizational Values. The social interaction component consists of activities that may occur within online communities. The information exchange component consists of factors that drive whether an exchange of information occurs in the online environment. The individual/organizational values component consists of the benefits, needs addressed, or value gained through participation in online communities. Healthy and unhealthy manifestations of the activities, factors, and attributes explain differences in the character of online communities, as shown in Figure 8 and elaborated in this chapter.

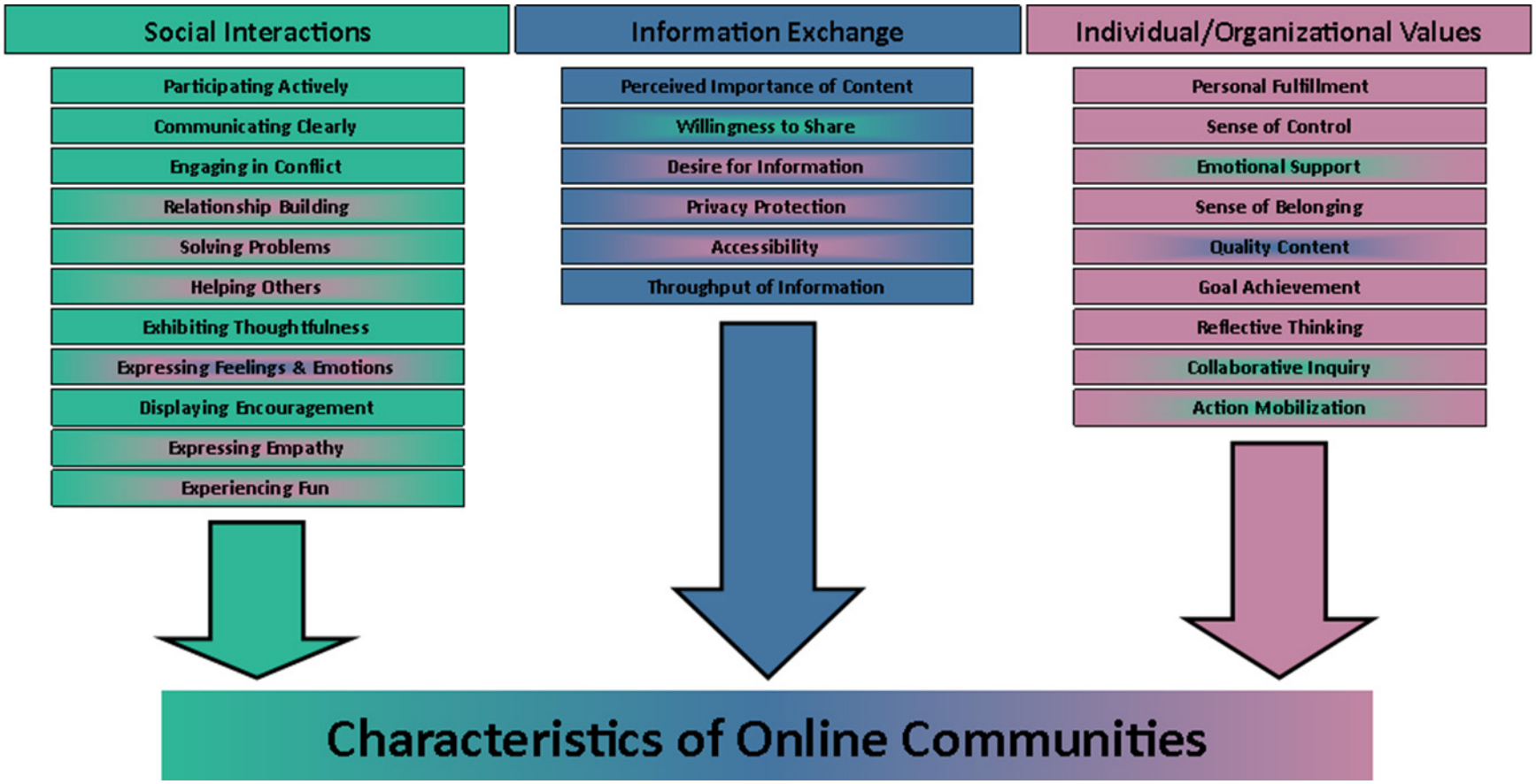

Figure 8. Characteristics of Online Communities

Of note, Figure 8 is color-coded by major component category: social interactions, information exchange, and individual/organizational values. Our analysis shows that the activities, factors, or attributes listed under each component category most closely represent the corresponding component.

Some elements in each of the three components are related to the other components. The elements that influence more than one component are indicated by the corresponding component color shading in the list of elements in Figure 8. For example, emotional support, listed under the "Individual/Organizational Values" component, also influences "Social Interactions." Individuals value emotional support, and in addition, there is a social interaction aspect to emotional support: emotional support (in this context) could not be exchanged absent the group. Some elements cross all three components. For example, in an online community environment, "Solving Problems" can be a social interaction where information is exchanged between users as individual users and potentially the organization gain value from the problem-solving interaction.

In addition to the interactions between elements and components, the contribution of the elements of each component to online community health varies. Figure 7 shows examples of both healthy and unhealthy manifestations of the activities, factors, and attributes that contribute to the overall character of an online community. The left-hand side of Figure 9 lists unhealthy manifestations, while the right-hand side shows healthy manifestations of each element. This figure highlights aspects of an online community that an organization may purposefully influence to increase the health of an online community. The figure presents extremes. It is likely, however, that the character of an online community results from a combination of social interactions, information exchanges, and valued benefits, including a spectrum of manifestations of activities, factors, and attributes falling somewhere between the unhealthy and healthy extremes or, potentially, including both.

Unhealthy Activities	Social Interactions	Healthy Activities
Participation is non-existent	Participating Actively	Users regularly participate in online community
Messages are misunderstood/lost in transmission	Communicating Clearly	Messages are received and understood as intended
Conflict is destructive and hinders growth	Engaging in Conflict	Constructive conflict provides opportunity for growth
Users stay to themselves/destroy relationships	Relationship Building	Users create bonds and friendships
Users provide problems/present useless solutions	Solving Problems	Users provide viable solutions
Success of other users is hindered by one's actions	Helping Others	User's actions contribute to other user's success
Communicating/acting without consideration of others	Exhibiting Thoughtfulness	Communicating/acting with considerations of others
Users chastise those who express feelings	Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Users discourage other users	Displaying Encouragement	Users actively encourage other users
Users display disdain, hatred, mercilessness, coldness	Expressing Empathy	Users display compassion, sympathy , and warmth
Users find the online social interaction unpleasant	Experiencing Fun	Users enjoy the online social interaction
Unhealthy Factors	**Information Exchange**	**Healthy Factors**
Irrelevant on non-important content	Perceived Importance of Content	Content is perceived by users as important
Users hoard information that could benefit others	Willingness to Share	Users are open to sharing for the benefit of the group
Users not interested in contributions from others	Desire for Information	Users actively pursue information from other users
Privacy leakage/User content distribution ignorance	Privacy Protection	User is protected and informed regarding their privacy
Content is inaccessible when desired	Accessibility	Content is available when needed
Too much or too little content availability	Throughput of Information	Managed flow of desired content without overload
Unhealthy Attributes	**Individual/Organizational Values**	**Healthy Attributes**
User participation diminishes feelings of gratification	Personal Fulfillment	User participation enhances personal gratification
Users lack autonomy within group	Sense of Control	Users have positive sense of autonomy
Users are unsupportive of others emotionally	Emotional Support	Users provide each other emotional support
Users feel isolated	Sense of Belonging	Users feel like members of a larger community
Inaccurate content exchange	Quality Content	Accurate content exchange
Users stifle accomplishment of others	Goal Achievement	Both users and group goals are accomplishment
Reflective thinking is not encouraged	Reflective Thinking	Reflective thinking encouraged as ideas are exchanged
Users choose to remain ignorant to group knowledge	Collaborative Inquiry	Users use other users as information resources
Inability to influence change	Action Mobilization	Users can garner support for change

Figure 9. Healthy and Unhealthy Activities, Factors, and Attributes of Online Communities

1. Social Interactions

Participants in online communities receive several benefits by forming social groups, which include information exchange, the expression of social and emotional support to other members, the development of friendships, and experiencing fun (Iriberri & Leroy, 2009). We find two distinct categories of activities—material activities and emotional activities—represented in Figure 10.

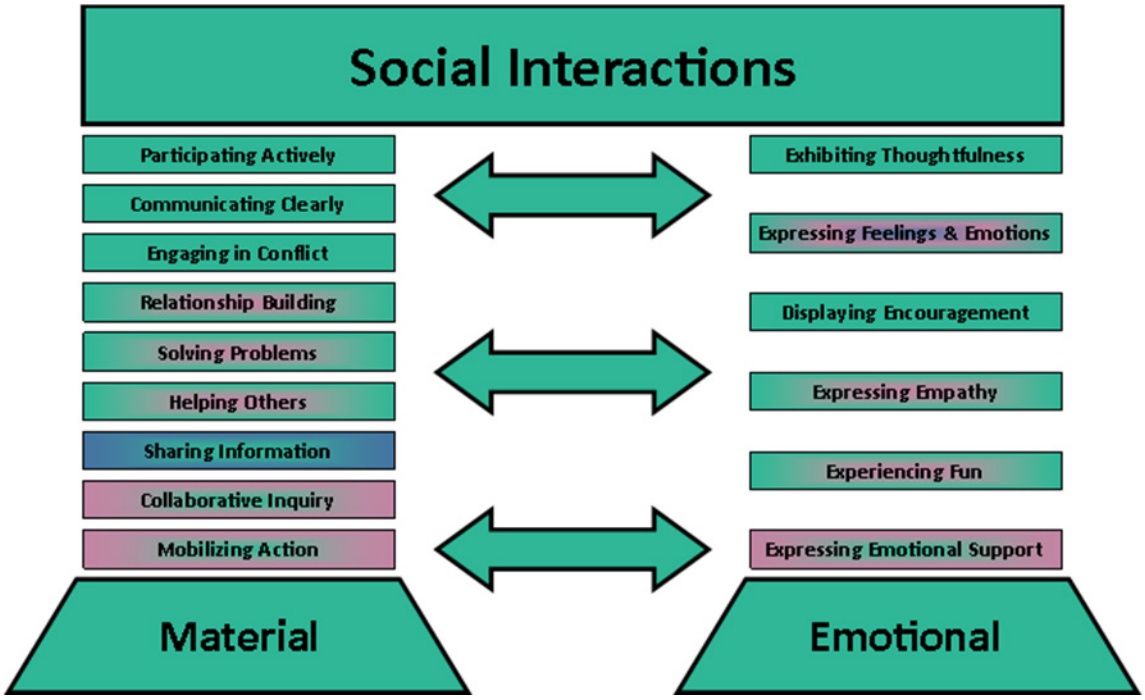

Figure 10. Social Interactions

Material activities create a persistent and visible output in the digital or physical space. These activities result in documents that can be printed, posts that can be read, friendships that can carry on in the physical world, or action that can be witnessed in the digital or physical space. Emotional activities are less visible. These activities focus on an individual's thoughts, feelings, and perceptions about the interactions taking place. Synthesis of the literature revealed that social interaction in online communities exhibit varying degrees of these activities, which potentially explains individuals' desire to

participate in a particular online community and as a result, the community's success or failure. The prevalence and character of the activities defines the character of the interaction of an online community.

a. Material Activities

We identified nine material social interaction activities: Participating Actively, Communicating Clearly, Conflict, Relationship Building, Solving Problems, Helping Others, Sharing Information, Collaborative Inquiry, and Mobilizing Action. Each of these activities can be manifested positively or negatively, as discussed in the previous section and shown in Figure 7.

(1) Participating Actively

Success in sustaining online communities is dependent on users actively participating (Sangwan, 2005). An online community without active participants becomes nothing more than a virtual site with no participants, ultimately rendering it useless. In contrast, a community with high levels of user participation is more likely to thrive. In an examination of the theoretical perspectives of uses, gratification, and organizational commitment, researchers found that feelings of belonging and social and cognitive factors were key participatory drivers (Lampe, Wash, Velasquez, & Ozkaya, 2010). When participants in an online movie rating group believed they were more dissimilar in taste for movies than similar, they tended to participate more (Ludford, Cosley, Frankowski, & Terveen, 2004). This recognizes the individual value of uniqueness.

(2) Communicating Clearly

Communicating clearly influences whether members are effectively transmitting their intended message. Since online communication occurs without the non-verbal and contextual signals that occur in face-to-face settings, it is vital that users communicate clearly to avoid misunderstandings. In Davis's (2012) study of K–12 teachers' use of Twitter for professional development, 29% of the teachers surveyed expressed dissatisfaction with misunderstandings that occurred, while 12% of this teacher group

also reported feeling ignored or not heard in the group when they posted and received no responses. Healthy communication between two or more individuals requires the sender to send the information in a way that it can be received by the sender. Additionally, receivers of information can have an impact on sender's perception of whether their intended message is even being heard.

(3) Engaging in Conflict

Conflict can be seen as a material manifestation of the emotional activity thoughtfulness. Thoughtfulness about how one interacts with others is not always apparent, and sometimes misunderstandings do occur, leaving people feeling less than satisfied. If the lack of consideration associated with a lack of thoughtfulness is present, the introduction of hostile behaviors in the online environment is possible. These hostile behaviors, or expressions of destructive conflict present in the form of flames, trolls, spam, cyber-rape, overt aggressive interactions, or unhealthy conflict, are not welcome in healthy online communities (Burnett & Buerkle, 2006). Healthy online communities, in contrast, would exhibit constructive conflict with the intent of building up others as opposed to tearing them down.

(4) Relationship Building

Relationship building refers to the potential for bonds to be created among users. One of the benefits participants in online communities receive from the forming of social groups is the development of friendships (Iriberri & Leroy, 2009). In unhealthy communities, users aren't taking advantage of this benefit and might stay to themselves or in extreme cases, might go out of their way to destroy relationships instead of building them.

(5) Solving Problems and Helping Others

Solving problems refers to actions taken to provide solutions to an ongoing issue. Helping others refers to actions taken to contribute to another individual's success. The solving problems and helping others material activities, commonly sought out in face-to-face self-help groups, is now sought after and provided in online support groups (Burnett

& Buerkle, 2006). The healthy component of solving problems and helping others occurs when users contribute to each other's success and provide viable solutions to problems. In contrast, the unhealthy component of these activities is marked by users hindering the success of others, potentially going so far as to initiate new problems for other members or present useless solutions.

(6) Sharing Information

Sharing information is related to the information exchange component factor, willingness to share. The sharing of information is another activity that is relevant in both face-to-face and online communities (Burnett & Buerkle, 2006). Access to information is another benefit participants in online communities receive through social groups (Iriberri & Leroy, 2009). Healthy online communities benefit from users who willingly share information with others. In contrast, one activity that might lend itself to creating an unhealthy community is hoarding information that might be useful to others in the online community.

(7) Collaborative Inquiry

Collaborative inquiry refers to the act of using other users as information resources and has its foundation in the individual/organizational values component. Davis's (2012) study of K–12 public school teachers' ability to use Twitter for professional development identified collaborative inquiry—the asking questions and soliciting information from other participants in the group—as an action that supports information sharing. In healthy online communities, this collaborative interaction is employed to encourage the sharing of the information that users would find useful. In an unhealthy online community, users might avoid asking questions or soliciting information, resulting in unanswered questions for which other users may have had an answer. The benefit of collaborative inquiry is access to answers another user may have.

(8) Mobilizing Action

Mobilizing action refers to the act of garnering support for one's cause and also has its foundation in individual/organizational values component. Within online

communities, users are able to mobilize groups of people to attack an issue or respond quickly to an immediate situation (Kollosche, 2014). In healthy communities, users are able to garner the attention of others within the group, which can result in follow-on actions, events, or movements taking place. A less healthy community is one in which users are not able to mobilize the community to impact change. Whether mobilizing action as an activity is characteristic of a healthy online community is not based on the positive or negative results of the mobilization of others, but on the ability to influence and mobilize others in the community at all.

b. Emotional Activities

We identified six emotional social interaction activities: exhibiting thoughtfulness, expressing feelings and emotions, displaying encouragement, expressing empathy, experiencing fun, and expressing emotional support. These emotionally based activities can also have both positive and negative extremes, as we discussed with other interaction activities and as shown in Figure 7.

(1) Exhibiting Thoughtfulness

Exhibiting thoughtfulness refers to how one interacts and communicates with others. As users participate in online communities, the method of participation, from one's crafting of dialogue in one's head to the external interaction that happens as one's thoughts become communication, has an effect on the community. The exhibiting thoughtfulness activity reflects this aspect of the social interaction. Burnett and Buerkle (2006) discussed the advantage of thoughtfulness being exhibited in replies in an online community environment using the example of a support group or recovery group for addicts. In online communities, users are able to take their time in carefully formulating their communications (Burnett & Buerkle, 2006). This becomes especially important in these types of communities where members of the group are particularly sensitive to issues that may come up in conversation. Exhibiting thoughtfulness in a healthy way includes communicating and interacting within the group in a way that shows consideration of others, in an attempt to ensure the comfort of the other members. In contrast, an unhealthy display or lack of exhibiting thoughtfulness might include a user

acting or communicating with total disregard for other's feelings, experiences, or the effect a particular interaction will have.

(2) Expressing Feelings and Emotions

Displaying encouragement and expressing empathy refer to the way members of a community interact with each other. Expression of feelings and emotions is focused on whether users are left comfortable expressing their feelings/emotions. Displaying encouragement is focused on the act of encouraging others. Expressing empathy is focused on displays of compassion, sympathy, and warmth during interactions. The displaying encouragement, expressing empathy, and expressing feelings and emotions activities are additional processes relevant in both face-to-face groups and online support groups (Burnett & Buerkle, 2006). Members in online self-help groups encourage other users to take responsibility for their own care, while being empathetic to their situation and creating the space for feelings to be expressed in a healthy way (Burnett & Buerkle, 2006). Encouragement, when received, can spark positive actions in the person being encouraged. Similar positive actions can stem from members of these communities experiencing empathy from others and feeling free to express themselves. Though these actions may manifest in the material sense, the feeling of being encouraged, having someone empathize, or feeling safe to express feelings and emotions is emotionally based. Encouraging other members of one's community can be viewed as a healthy activity as it leaves users feeling encouraged to go forth and have positive impact on their community, in their lives, and/or in the world. In contrast, displays lacking encouragement can lead to online community members feeling discouraged. A healthy expression of empathy involves users displaying compassion, sympathy, and warmth to other users instead of disdain, hatred, mercilessness, and coldness. Healthy online community engagements include those in which expressions of feelings and emotions are supportive of the expressions of others, while an unhealthy expression might include users chastising those who express their feelings and emotions, inhibiting the desire to express oneself in the future.

(3) Experiencing Fun

Experiencing fun refers to whether users are enjoying themselves during the online community interaction. The experiencing fun activity can manifest as another benefit participants in online communities receive through formation of social groups (Iriberri & Leroy, 2009). In healthy online communities, users enjoy the online interactions. In contrast, a sign an online community might be unhealthy is if users find the online social interaction to be an unpleasant experience.

(4) Expressing Emotional Support

The expressing emotional support activity, which relates to the valued benefit component—emotional support—can also be an activity which benefit participants in online communities (Iriberri & Leroy, 2009). Users of online forums can express emotionally supportive language during interactions, which can relieve feelings of discouragement in other users (Davis, 2012). The activity of creating the emotional space where discouragement is lessened is an attribute of a healthy online community. In contrast, an unhealthy online community might be absent of expressions of emotional support, or worse, might include users who purposefully sabotage another user's emotional wellbeing.

2. Information Exchange

The information exchange component is a conduit, which enables social interaction to produce valued benefits. Synthesis of the literature revealed that the information exchange component can be reduced to three distinct categories of factors, which determine whether this exchange of information will occur. These categories are represented in Figure 11.

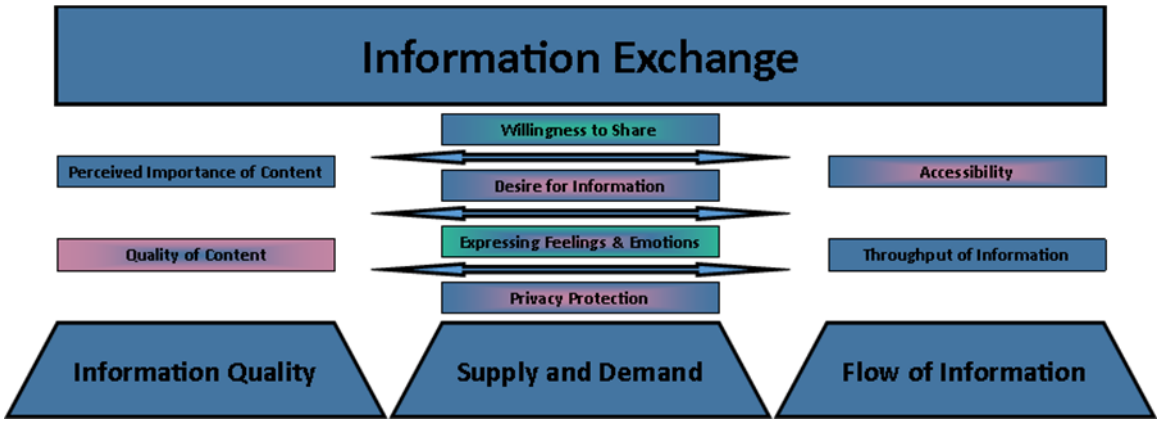

Figure 11. Information Exchange

The supply and demand factors represent the need for both users who create content or have information to share and those who desire the content or information. The information quality themes largely drive the need for the information or content. Last, the flow of information factors speaks to the throughput of information or content and identifies factors that promote or hinder the information exchange process. Synthesis of the literature revealed that information exchange within online communities, like social interactions, have the potential to exhibit varying degrees of these factors. The mix of how these factors are employed likely contributes to how successful information exchange is within an online community. The prevalence or lack of each factor combined with the others influences the likelihood that information exchange will occur and to what extent.

a. Information Quality Factors

We identified two information quality information exchange factors: Perceived Importance of Content and Quality of Content. These themes, like all presented thus far can have positive and negative extremes as previously discussed and shown in Figure 7, which impact the overall health of an online community. These two themes identify different aspects of information quality that together contribute to whether an individual user would consider content for exchange in an online community.

(1) Perceived Importance

The perceived importance of content factor is guided by a user's desire for information. Across topics from alternative science to celebrities, unknown information is often desired, and users will seek this unknown information within online forums, like Yahoo Answers (Adamic, Zhang, Bakshy, & Ackerman, 2008). Interestingly, even in situations where information in these online forums is not accurate, Yahoo Answers users believe the information and share it as if it is accurate (Adamic et al., 2008). Regardless of whether the information is accurate, participants in the Yahoo Answers forums believe the information marked "best" and are exchanging it as a result (Adamic et al., 2008). This leads us to believe that the importance of information is not based solely on whether content is factual, as users may find content important or "best" that has no basis in fact. From this perspective, one can conclude that perceived importance of content has an impact on whether information exchange is going to occur. Since a healthy online community is one in which information is exchanged, the perception that content within the online community is important likely increases the health of the online community, while irrelevant or non-important content, in contrast, would diminish online community health.

(2) Quality of Content

The quality of content theme, which is related to the individual/organizational values component quality content attribute, captures the accuracy factor not accounted for in the perceived importance of content factor. Quality content is important for user gratification (Sangwan, 2005). Concerns often exist that information present in an online platform is inaccurate or misrepresented, which can negatively affect the value online community stakeholders can garner from the information exchange (Burnett & Buerkle, 2006). In a health-related online community, for example, users ended up feeling deceived once they discovered that a user made up ailments in order to get sympathy and support from others in the group who were suffering from actual ailments (Burnett & Buerkle, 2006). A healthy online community is one in which members do not feel deceived by others. A healthier online community will be supported with accurate

content, while a less healthy online community might be rife with more inaccuracies and deception.

b. Supply and Demand Factors

We identified four supply and demand information exchange factors: Willingness to Share, Desire for Information, Expressing Feelings and Emotions, and Privacy Protection. These themes, like all presented thus far, can also have positive and negative extremes, as discussed previously and shown in Figure 7; these factors impact the overall health of an online community. Information sharing comes in many forms. In the health arena, users have increased their use the online environment as a place to get information and support in the form of feedback, information, and second opinions, and potentially get help in solving problems (Burnett & Buerkle, 2006). Online communities place individuals looking for information in contact with similar individuals—perhaps patients sharing a medical condition who could discuss treatments or individuals who might be able to provide expertise in a subject area like medical professionals can provide advice (Burnett & Buerkle, 2006). No matter which type of information is being shared, the law of supply and demand still applies. If there are not both users to supply the information and users looking for, or demanding, that information, an exchange of that content isn't likely to occur.

(1) Willingness to Share

Willingness to share refers to how open users within a group are to providing content or information to others. The willingness to share theme can be illuminated by a study conducted with employees of the Fortune 100 company, Caterpillar Inc., which looked at employee motivations to participation in virtual knowledge-sharing communities and identified reasons for which employees were willing to supply knowledge to their communities of practice. The study found that employees who participated in the knowledge-sharing sometimes saw their knowledge as a public good and felt that they had a moral obligation to the organization and to their professional community to actively participate. The study also found that sometimes employees had a need to be perceived as an expert within the community or to feel as if they had achieved

a certain stage in their career, deeming it necessary to pass the knowledge on to those new to the community (Ardichvili, Page, & Wentling, 2003). Despite the reasoning behind an employee's participation, without the initiation of action on the part of the sharer, there was no supply of information for the exchange to occur and therefore no benefit to the collective (Ardichvili et al., 2003). Therefore, it is imperative that community leaders effectively and proactively encourage employee participation and willingness to share, which can be achieved in several ways (Guy, Ronen, Kravi, & Barnea, 2016). Online community leaders can boost member participation through platform-generated recommendations. In a study, using IBM Connections as the study platform, recommendations were generated based on community actions such as likes and comments resulting in greater willingness to share (Guy et al., 2016). The healthiness of an online community is impacted by the level of sharing. If users are open to sharing for the benefit of the group, the online community is likely to be more helpful than if users have information that they instead choose to hoard, preventing the benefit of knowledge-sharing.

(2) Desire for Information

The desire for information theme is representative of the notion that in addition to users having a willingness to share, users must also want the information being provided for information exchange to occur. In a study of Twitter use for teacher professional development, Davis (2012) discovered that flow of information, or in this case, the perceived quantity of helpful posts and resources during discussions, is an appreciated benefit of the technology that supports online communities. Davis (2012) also reported that 100% of the teachers in the study valued the amount of information available in their online community. A healthy online community likely has individuals who actively pursue information from other users, while a less healthy online community lacks users interested in the contributions of others. The last two themes, which emerged from the literature for supply and demand, add dimensions within the sharing of and desire for information construct.

(3) Expressing Feelings and Emotions

The expressing feelings and emotions theme, which is related to the social interactions activity by the same name, is representative of the notion that in some cases online communities provide an avenue for emotional support to be exchanged between participants (Iriberri & Leroy, 2009). The expression of feelings and emotions does require participants to both supply that emotional support and to be willing to share the emotional information. Similar to the willingness to share and desire for information factors, a healthy online community has users both open to sharing and receiving this emotional content, while less healthy communities would not.

(4) Privacy Protection

The privacy protection theme refers to how the appreciation associated with information exchange can morph into un-appreciation as privacy concerns develop from more information being shared than one desires. Privacy leakage concerns are increased for both individuals and organizations as people join online social networks and as information is shared with third party advertisers, data aggregators, external applications, and other members within an online community who may or may not be connected to a user (Krishnamurthy & Wills, 2008). In a healthy online community, the privacy of users is protected by the online community, and users are informed about how their information is being used. In contrast, privacy leakage and user ignorance about who or what organizations have access to their information is a less healthy characteristic of an online community.

c. Flow of Information Factors

We identified two flow of information, information exchange factors: Accessibility and Throughput of Information. These themes too can have positive and negative extremes as shown in Figure 7, which impact the overall health of an online community. These two themes identify different aspects of information flow, which impacts the usefulness of the information exchange.

(1) Accessibility

The accessibility theme refers to whether a user can access or produce content at the time that they desire to do so. Online communities have the potential to provide a location for people who normally wouldn't ask for the information they desire 24 hours a day (Burnett & Buerkle, 2006). Online support groups, for example, allow individuals the autonomy to decide when to seek assistance, participate in dialogue or conversation, and what information about oneself is revealed (Burnett & Buerkle, 2006). Having access when needed maximizes the user benefit and can therefore be viewed as a healthy aspect of online communities, while limiting access to assistance, participation, and information within online communities can be viewed as an unhealthy factor.

(2) Throughput of Information

The throughput of information factor refers to the amount of information that is passing through a user's purview within an online community. Davis's (2012) Twitter study revealed that there is a point where too much information can become a negative. In the study, Twitter users' inability to keep up with the information flow had a negative effect on the perceived value of the online community itself, while 70% of the same group saw flow of information as a potential negative, as some discussions were hard to keep up with due to the fast-paced flow of information (Davis, 2012). While online community users desire information, too much information can reduce the value of the information present. A healthy online community might manage this flow of information to ensure the desired content is being received by users while controlling for an overflow of information.

3. Individual/Organizational Values

The individual/organizational values component consists of both psychosocial and productivity needs, which are more or less present as attributes within an online community. The success of an online community largely depends on the individual and organizational stakeholders of these online communities perceiving needs being met or benefit gained from participation. A lack of perceived benefit or needs being met would cause users and sponsoring organizations of online communities to focus their energies

where needs are being met and benefit is being realized. Figure 12 identifies individual/ organizational values discovered during the literature review and breaks them down into two categories based on the nature of the needs they address: Psychosocial Needs and Productivity Needs.

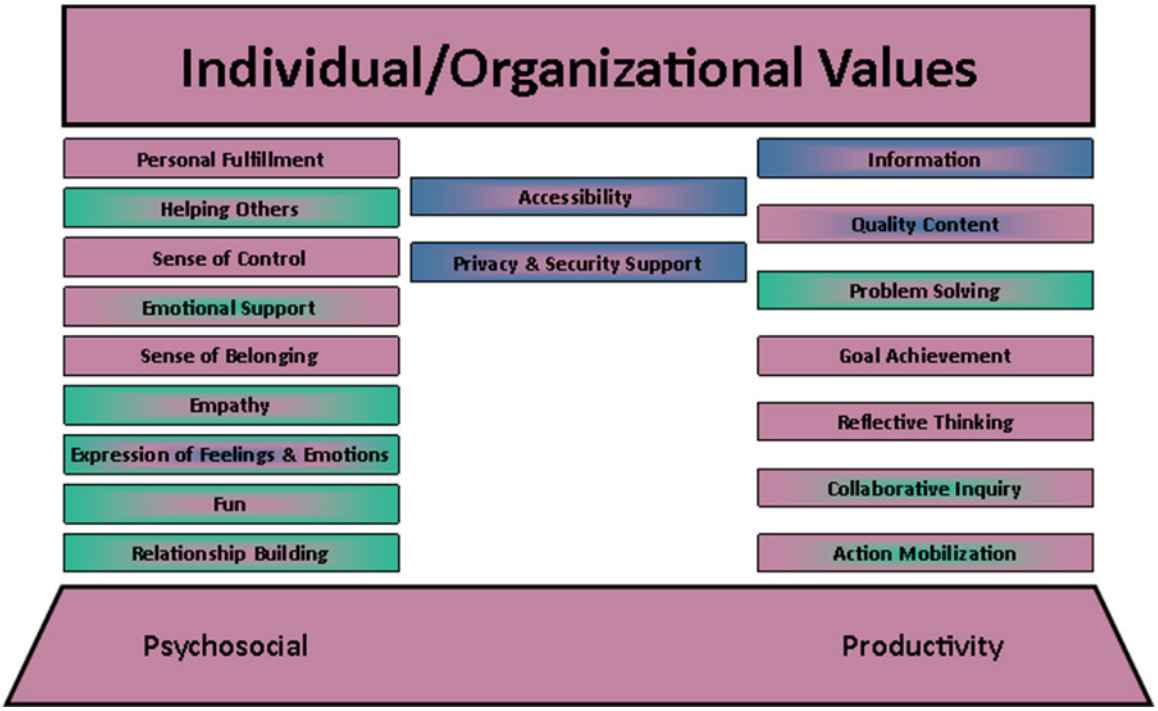

Figure 12. Individual/Organizational Values

Successful online communities create value for their organization (Sangwan, 2005). To answer how success should be measured, Matthews et al. (2014) conducted a study that determined that leaders' perceptions of the importance of community goals and the value members assigned to their communities, individually, were poor measures of success. However, when leaders' goals and a member's value of their communities overlapped, a means for measuring success is realized that can be used to promote goals within the community (Matthews et al., 2014). Participation in an online community can yield benefits that are valued by individual users, groups within an online community, the online community itself, a larger community or organization existing outside the online community, and potentially even society. Since occasionally what benefits the individual

is also good for a larger group, several of the identified attributes can yield benefits to individuals, groups, and organizations alike. The more benefits perceived or valued within an online community, the greater the likelihood of the community being a healthy one because it is fulfilling the needs of its members.

a. Psychosocial Attributes

We identified 11 psychosocial individual/organizational value attributes: Personal Fulfillment, Helping Others, Sense of Control, Accessibility, Privacy and Security Support, Emotional Support, Sense of Belonging, Empathy, Expressions of Feelings and Emotions, Fun, and Relationship Building. Psychosocial needs aim to foster mental and emotional wellbeing. Within online communities, these benefits are granted to users and organizations through the user's own participation in the community, through interaction with the online community interface itself, and through interactions with others in the community.

(1) Personal Fulfillment and Helping Others

The personal fulfillment and helping others attributes are benefits that manifest while participating in online communities and are provided to the individual through the user's own actions, not from the community itself. The personal fulfillment theme focuses on whether a user feels as if they are achieving in accordance with their own personal goals. According to Sangwan (2005), successful online communities fulfill member needs, often providing feelings of personal fulfillment and gratification through the sharing of information. The individual sharing his or her information or content is what provides the benefit of feeling fulfilled in this situation. In addition to the sharing of information, personal fulfillment can be achieved within online communities through altruistic means, including helping others (Iriberri & Leroy, 2009). The helping others theme, which relates to the social interactions component theme by the same name, involves whether an individual user's actions are contributing to the success of other users. Users who gain benefit from this theme are those who receive gratification for their actions that aid others.

(2) Sense of Control

While the sense of control, accessibility, and privacy and security support attributes are provided by the online community, the individual receives these benefits from the interface of the online community itself instead of the interaction with others in the community. Sense of control refers to one's feeling of autonomy when participating in an online community. The online community provides a sense of control in the form of the autonomous environment, which enables those who wouldn't typically feel in control in a situation, in which they were asking strangers for information for example, the empowerment to engage or not engage from a place of comfort where they can be anonymous while still getting their informational needs met (Burnett & Buerkle, 2006). Depending on the nature of the online community (i.e., access requirements, social vs. work), users can participate in online communities from almost anywhere, can have varying degrees of anonymity, and can choose when and with whom they interact. For those who don't feel a level of control in their offline life, this can be of great value.

(3) Accessibility

Accessibility refers to the user's ability to obtain content when desired. Related to the information exchange factor by the same name, the ability to access information when desired due to availability of the online interface proves to be a benefit. One of the benefits recovering addicts receive from participation in computer-mediated communication, for example, is the around-the-clock availability of the support or information (Burnett & Buerkle, 2006). In a face-to-face support group, once the group meeting ends, the interaction is over and if a need for additional information or support arises, that individual would theoretically have to wait until the medium for communication is reestablished, be it another scheduled meeting or inconveniently interrupting another party with a phone call perhaps (Burnett & Buerkle, 2006). Around-the-clock access is a benefit of many online communities.

(4) Privacy and Security Support

The privacy and security support attribute, which is related to the privacy protection information exchange factor, refers to the need users have for privacy and

security, which can vary based on personality and demographic traits (Minkus & Memon, 2014). Since more people and organizations are using online communities, privacy leakage is becoming a more significant issue (Krishnamurthy & Wills, 2008). Personalization of default privacy options for new members to online communities based on these personality and demographic traits can reduce unintended privacy concerns for those who don't realize that a community's default settings aren't in line with their privacy desires (Minkus & Memon, 2014). Personalization of default privacy options is therefore a benefit to members of online communities that build personalization of privacy settings into the online community interface.

(5) Emotional Support

Emotional support, sense of belonging, empathy, expression of feelings and emotions, fun, and relationship building are needs that can be met through the interactions with others within online communities. The emotional support factor refers to the need users have for others to provide emotional support. Regarding emotional support, participants in Davis's (2012) study viewed the encouragement gained within their online forum as a valuable form of emotional support, even diminishing the amount of discouraging feelings experienced. In this study, the individual participants gained their benefit from the other user's expression of support and encouragement.

(6) Sense of Belonging

The sense of belonging attribute can be characterized by feeling a need to belong to something bigger than oneself. All of the participants in Davis's (2012) study experienced a sense of belonging to the group that they appeared to enjoy. This benefit is likely due to the interactions the other participants had on each individual user as without the presence of the other users, there would be no group to belong to.

(7) Empathy and Expression of Feelings and Emotions

The empathy attribute refers to the need for compassion, sympathy, and warmth from other humans. The expression of feelings and emotions attribute refers to a user's desire to freely express his or her feelings or emotions. The benefits associated with the

empathy and expression of feelings and emotions attributes, which are related to the expressing empathy and expressing feelings and emotions social interaction activities, were highlighted by Burnett and Buerkle (2006) in their work with online support groups. The members in support groups provide empathy and space for the members requiring support to feel free to express their feelings and emotions (Burnett & Buerkle, 2006). These are important benefits for someone in need of a safe place to express themselves and for empathetic discourse with others.

(8) Fun & Relationship Building

The fun attribute refers to a user's enjoyment of participation in the online community. The relationship-building attribute refers to a user's desire to develop bonds with other members. The benefits associated with the fun and relationship-building themes, which are related to the experiencing fun and relationship-building social interactions activities, occur when users participate with others in online communities (Iriberri & Leroy, 2009). The interaction between members of these online communities creates the opportunities for bonds to be developed between users, sometimes with people located a significant distance apart. The benefit of fun, experienced from the enjoyment of these interactions and activities within the online community framework is an additional bonus of the relationship building that occurs through participation.

b. Productivity Attributes

We identified nine productivity individual/organizational values attributes: Information, Accessibility, Quality Content, Privacy and Security Support, Problem Solving, Goal Achievement, Reflective Thinking, Collaborative Inquiry, and Action Mobilization. The productivity attributes include those related to the ability to enhance one's organization, group, or individual productivity. While these attributes are all related to increasing productivity, the way in which increased productivity is accomplished varies. Productivity can be gleaned from participation in online communities when the online community itself acts as a resource, or the online community can act as a tool for accomplishing more than one could accomplish alone. Information, accessibility, quality content, privacy and security support, and problem solving are all productivity need-

based benefits that are gleaned from utilizing the online community as a resource. Goal achievement, reflective thinking, collaborative inquiry, and action mobilization are all benefits that occur as a result of the online community acting as a tool for accomplishing more as a group than an individual user would be able to accomplish alone.

(1) Information

The information attribute, related to the desire for information factor from the information exchange component, refers to the benefit associated with having access to the information provided within online communities. In health-related online communities, users are provided with (health) support and information (Burnett & Buerkle, 2006). Other community types provide information relevant to the users of that group. The access to this information that one otherwise wouldn't have access to allows for individuals and organizations to make more informed and productive decisions.

(2) Accessibility

The accessibility attribute, also relevant as a psychosocial need as previously described, is of benefit in a productivity sense if users of online communities are able to access content and/or information when needed and can use the content to be more productive.

(3) Quality Content

The quality content attribute refers to the benefit associated with receiving accurate content during participation in online communities, as described in the previous information quality section. According to Sangwan (2005), information need is significantly correlated with user satisfaction, which implies a positive relationship between quality content and user gratification.

(4) Privacy and Security

The privacy and security support theme, also relevant as a psychosocial need as previously described, is of benefit in a productivity sense when the privacy and security support is able to protect the work of the individuals and organization from being

violated. As information including personally identifiable information and trade secrets can be considered valuable, both individuals and organizations can find value in maintaining and protecting their privacy (Krishnamurthy & Wills, 2008).

(5) Problem Solving

The problem-solving theme, related to the solving problems social interactions component activity, refers to the benefit users and organizations get in the form of identified solutions and answered questions. The online community can be a resource for helping users solve problems the same as face-to-face self-help groups can (Burnett & Buerkle, 2006).

(6) Goal Achievement

The goal achievement attribute is nurtured by the helping others psychosocial need previously mentioned. Users of online communities who are fulfilling altruistic goals within an online community by helping others can simultaneously help the community achieve participation goals or achieve group goals that benefit the larger community (Iriberri & Leroy, 2009).

(7) Reflective Thinking

The reflective thinking attribute refers to the benefit users get from interacting with others that causes a reevaluation of preconceived beliefs. 70% of the teachers in Davis's (2012) study saw participation in online communities as an opportunity for reflective thinking, some reporting that participation in the online forum was actually the impetus for reflective thinking to occur. This reflective thinking is valued because it caused these teachers to look at ways they can be more effective in grading, for example, which benefits the teacher in that they are becoming more self-aware of their processes while the organization benefits by the better grading practices (Davis, 2012).

(8) Collaborative Inquiry

The collaborative inquiry attribute refers to the benefits gained through collaboration and teaming which, among enterprise online communities, can bring about

opportunities for innovation and value to the organization (Muller et al., 2012). Davis (2012) reported that 59% of the teachers in her Twitter use for professional development study reported valuing the collaborative dialogue experience and being able to ask questions and seek out feedback. Additionally, 88% of the participants archived discussions which were the result of collaborative inquiry indicating perhaps the conversations were valued at an even higher rate (Davis, 2012).

(9) Action Mobilization

The action mobilization attribute refers to the ability for members of online communities to unite for causes and take action on an issue as a group unit. Organizations use online communities to mobilize action by using technology to incite mass movement towards a particular cause (Kollosche, 2014). This ability to incite mass movement on a cause is not limited to organizational use though. The easy access to technology and camera phones allows for images to be spread around the world in a matter of minutes. This technology allows for members of online communities to quickly mobilize participation in situations as emergent as the Egyptian and Syrian uprisings (Kollosche, 2014).

The technical features of a platform, in some cases, allow the communication of a sense of identity that can positively affect a person's willingness and effort to contribute in online communities. Ma and Agarwal (2007) found, through a survey of 650 members of two distinctive communities, that users felt freer to participate in the online community when members had a salient understanding of who each other were. Muller et al. (2012) found that tailored community leadership and design can result in beneficial outcomes that, when combined, could synergize organizational efforts in maximizing value.

B. BUILDING AND MAINTAINING HEALTHY ONLINE COMMUNITIES

Review of the online community literature resulted in identification of three key action areas in which organizations can affect online community health, through a moderator, online community leader, or member of an online community. The three areas, as identified in Figure 13.

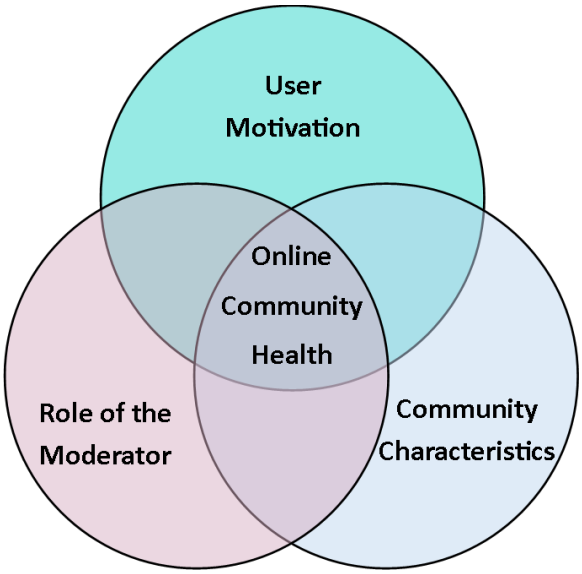

Figure 13. Online Community Health Action Areas

1. User Motivation

The user motivation action area refers to ways in which community health can be influenced through appealing to or affecting the motivation of online community users. Hur and Hara's (2007) research to discover factors that support and hinder sustainable online teacher communities postulates that there are various internal, external, and outcome factors. Regarding support of sustainable communities, Hur and Hara (2007) identify the internal, external, and outcome based support factors presented in Table 10.

Table 10. Sustainable Online Teacher Community Support Factors [adapted from (Hur & Hara, 2007, p.254)]

Subgroups	Support Factors
Internal Factors	Having the autonomy
	Having a sense of ownership
	Acknowledging values of participation
External Factors	Providing online and offline interactions
	Providing an easy way to use technology systems
Outcome Factors	Helping novice teachers become confident educators
	Assisting in overcoming teacher isolation
	Meeting teachers' individual needs

These internal, external, and outcome factors have roots in user motivation and choosing to participate for one reason or another. Participants in an online community value having a choice regarding their participation, specifically, which subjects they engage in and how much depth they choose to expose themselves to (Davis, 2012). A user's choice of when and how to participate is influenced by varying motivating factors. These factors, once identified, can be used by those desiring to build and maintain healthy online communities. This is accomplished by purposefully embracing the positive motivations and combatting the negative motivations.

a. Embracing Positive Motivations

Embracing the positive motivations of users is the constructive means of enhancing community health through appealing to what motivates users. Bateman, Gray, and Butler (2011) presented three types of community commitment that drive individuals to stay committed to participation in a community:

- Continuance community commitment: Members believe the value of participation in one community is superior to participation in other communities.
- Affective community commitment: Though difficult to develop, members characterized by affective community commitment become emotionally attached to a community.
- Normative community commitment: Though not a good predictor of participation in online communities, these members feel indebted to or feel a need to be loyal to a community and participate as a result.

Most motivations uncovered during the literature review fit within the three commitment types. Members within each commitment category should be embraced by online communities and their leadership in order to glean the healthy activities, factors, and attributes they bring to the online community. All of these community commitment types can increase the active participation within the community.

Fugelstad et al. (2012), in their study of almost 4,000 MovieLens community members to understand what motivates people to volunteer or participate in online communities, identified three motivation categories for participation:

- General volunteer motives, implying that some volunteer or participate in online communities because they are motivated to connect with and help other people.
- Pro-social behavioral history, implying that some volunteer because historically they have volunteered more than others to improve content and therefore are more likely to participate in content improvement (in this case movies) and invest in question-and-answer forums than those who did not.
- Community-specific motives, implying that reasons for joining the MovieLens community were reflected in the type of participation seen in user behavior.

Fugelstad et al.'s (2012) concept of general volunteer motives is closely linked to Bateman et al.'s (2011) affective community commitment. Fugelstad et al.'s (2012) pro-social behavioral history speaks to the emotional attachment aspect of Bateman et al.'s (2011) affective community commitment and the historical norm aspect of their normative community commitment. Fugelstad et al.'s (2012) community-specific motives category appears to speak to the benefits gained in Bateman et al.'s (2011) continuance community commitment. The one motivation that did not fit cleanly within either of Bateman et al.'s (2011) community commitment category was the desire to be established as an expert, as there is no competing community or focus on emotional attachment, and loyalty was not a factor. This motivation was presented by Ardichvili et al. (2003), in conjunction with a motivation that was loyalty-based, in their findings of motivators for participating in the sharing of one's knowledge in an online community of practice being a desire to establish oneself as an expert or feeling as if a level of success had been achieved requiring users to give back to the community (Ardichvili et al., 2003). Since Fugelstad et al.'s (2012) categories cross community commitment

categories and the remaining motivations fit cleanly within the community commitment categories, we focus the remaining user motivation discussion on the community commitment categories.

(1) Continuance Community Commitment

Community members who exhibit community commitment, though not likely to give back to a community, attempt to maximize their benefit from the community, which attracts content providers, thereby growing the community (Bateman et al., 2011). Sangwan (2005) provides an example of continuance community commitment in identifying users motivated by an emotive need characterized by a drive to interact with peers and influential people and contribute to personal fulfillment through self-expression. Another example of continuance community commitment is captured in Cha, Haddadi, Benevenuto, and Gummadi's (2010) study measuring user influence on Twitter. The study revealed that the number of followers a user has is an indicator of a user's popularity and not their influence, retweets are influenced by the content value, mentions are influenced by the name value of the content poster, and a large number of followers does not necessitate high retweets or mentions (Cha et al., 2010). While name value–based mentions can lack significant content and content-driven retweets may lack mentions while still being influential, Cha et al. (2010) stated that this influence is typically gained on purpose and requires significant personal involvement. Understanding the desires of these users, be it influence, content, or an emotive need can help communities to embrace those with continuance commitment to increase the healthy individual/organizational values attributes as these users receive the benefits they value most from the online community, including receiving emotional support, a sense of control, or quality content for example. Also, these users can have a positive impact on social interactions including those associated with the relationship building and experiencing fun activities if those are the interactions they are looking to benefit from. Additionally, their participation solidifies the healthy information exchange factors of perceived importance of content and desire for information. Figure 14 shows potential benefits of embracing members within an online community with continuance community commitment.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Relationship Building	Users create bonds and friendships
Experiencing Fun	Users enjoy the online social interaction
Information Exchange	**Healthy Factors**
Perceived Importance of Content	Content is perceived by users as important
Desire for Information	Users actively pursue information from other users
Individual/Organizational Values	**Healthy Attributes**
Personal Fulfillment	User participation enhances personal gratification
Sense of Control	Users have positive sense of autonomy
Emotional Support	Users provide each other emotional support
Sense of Belonging	Users feel like members of a larger community
Quality Content	Accurate content exchange
Goal Achievement	Both users and group goals are accomplishment
Reflective Thinking	Reflective thinking encouraged as ideas are exchanged
Collaborative Inquiry	Users use other users as information resources
Action Mobilization	Users can garner support for change

Figure 14. Embracing Motivations—Continuance Commitment

(2) Affective Community Commitment

Community members who exhibit affective commitment are motivated to help others in the community by engaging with them which may contribute to long-term success of the community as these individuals act in selfless ways like responding to questions (Bateman et al., 2011). A potential example of affective community commitment was revealed in Fugelstad et al.'s (2012) study to predict participation in an online community. They discovered that participation can be predicted by historic motives including an individual's desire to behave altruistically or to receive accurate recommendations from a specific community (Fugelstad et al., 2012). They found that the volunteering motivated by the prospect of helping others increased participation while self-oriented volunteering and self-oriented altruistic behavior negatively predicted participation (Fugelstad et al., 2012). Embracing those with affective commitment can increase many of the healthy activities associated with social interaction activities including relationship building, helping others, expressing empathy, and displaying encouragement. Additionally, these members are likely to display healthy information exchange factor willingness to share and individual and organizational value attributes

including emotional support, sense of belonging, and collaborative inquiry. Figure 15 shows the potential benefits of embracing members within an online community with affective community commitment.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Conflict	Constructive conflict provides opportunity for growth
Relationship Building	Users create bonds and friendships
Solving Problems	Users provide viable solutions
Helping Others	User's actions contribute to other user's success
Exhibiting Thoughtfulness	Communicating/acting with considerations of others
Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Displaying Encouragement	Users actively encourage other users
Expressing Empathy	Users display compassion, sympathy , and warmth
Information Exchange	**Healthy Factors**
Willingness to Share	Users are open to sharing for the benefit of the group
Individual/Organizational Values	**Healthy Attributes**
Emotional Support	Users provide each other emotional support
Sense of Belonging	Users feel like members of a larger community
Quality Content	Accurate content exchange
Goal Achievement	Both users and group goals are accomplishment
Collaborative Inquiry	Users use other users as information resources
Action Mobilization	Users can garner support for change

Figure 15. Embracing Motivations—Affective Commitment

(3) Normative Community Commitment

Last, community members who exhibit normative commitment continue to read threads and post replies to others due to their loyalty or indebtedness feelings (Bateman et al., 2011). An example of normative community commitment was uncovered in a study conducted at Fortune 100 multinational corporation, Caterpillar Inc. The study revealed that employees were willing to contribute their knowledge to virtual communities of practice because they viewed their knowledge as a public good or they felt a moral obligation to contribute their knowledge for the sake of the community (Ardichvili et al., 2003). Embracing these individuals can increase the willingness to share health factor and can increase the likelihood of several healthy attributes based on individual and

organizational values and healthy social interactions are continuing within an online community. Figure 16 shows potential benefits of embracing members within an online community with affective community commitment.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Relationship Building	Users create bonds and friendships
Solving Problems	Users provide viable solutions
Helping Others	User's actions contribute to other user's success
Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Displaying Encouragement	Users actively encourage other users
Expressing Empathy	Users display compassion, sympathy , and warmth
Experiencing Fun	Users enjoy the online social interaction
Information Exchange	**Healthy Factors**
Willingness to Share	Users are open to sharing for the benefit of the group
Individual/Organizational Values	**Healthy Attributes**
Emotional Support	Users provide each other emotional support
Sense of Belonging	Users feel like members of a larger community
Collaborative Inquiry	Users use other users as information resources
Action Mobilization	Users can garner support for change

Figure 16. Embracing Motivations—Normative Commitment

b. Combatting Negative Motivation

Combatting negative motivation refers to actions focused on fighting the less constructive motivations held by users of online communities in an effort to not let the negative motivations of those users affect the community. Several online community user motivations contribute to unhealthy communities. Awareness of these motivations by online community leaders might allow for these negatives to be countered. Included in the online community literature were negative aspects of motivation based on both internal factors and external factors.

(1) Internal Factors

Internal factors that negatively affect motivation include lacking confidence and feelings of discouragement based on prior experiences. Hur and Hara (2007) found that teachers' lack of confidence and previous negative experiences in online communities

hindered the fostering of sustainable communities. In Ardichvili et al.'s (2003) study at Caterpillar Inc., they discovered participants in a knowledge-sharing community suspected of hoarding, lacking a willingness to share in order to prevent the sharing of knowledge, were in fact not participating in response to fears of posting inaccurate or irrelevant information. The users didn't want to mislead colleagues, they feared criticism, and they didn't want to be looked at negatively for posting information that wasn't going to be valued (Ardichvili et al., 2003).

Sometimes the discouragement is due to deception in the past. Burnett and Buerkle (2006) describe how participants in a health information forum deceived other members of the community by claiming illnesses that they did not possess in order to garner attention. Being able to identify when users are lacking confidence or feeling discouraged opens up an opportunity for online community members and leaders to encourage those users who might be limiting their participation. Alleviating these negative motivations can increase healthy social interactions activities including relationship building, displaying encouragement, and exhibiting thoughtfulness; healthy information exchange factors including willingness to share and desire for information; and healthy individual/organization value attributes including sense of control, sense of belonging, and collaborative inquiry. Figure 17 shows potential benefits of combatting negative internal motivations.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Engaging in Conflict	Constructive conflict provides opportunity for growth
Relationship Building	Users create bonds and friendships
Solving Problems	Users provide viable solutions
Helping Others	User's actions contribute to other user's success
Exhibiting Thoughtfulness	Communicating/acting with considerations of others
Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Displaying Encouragement	Users actively encourage other users
Expressing Empathy	Users display compassion, sympathy , and warmth
Experiencing Fun	Users enjoy the online social interaction
Information Exchange	**Healthy Factors**
Willingness to Share	Users are open to sharing for the benefit of the group
Desire for Information	Users actively pursue information from other users
Individual/Organizational Values	**Healthy Attributes**
Personal Fulfillment	User participation enhances personal gratification
Sense of Control	Users have positive sense of autonomy
Emotional Support	Users provide each other emotional support
Sense of Belonging	Users feel like members of a larger community
Goal Achievement	Both users and group goals are accomplishment
Collaborative Inquiry	Users use other users as information resources
Action Mobilization	Users can garner support for change

Figure 17. Combatting Negative Motivations—Internal

(2) External Factors

External factors negatively affecting motivation included lack of technological support and discouragement. Hur and Hara (2007) identified lack of technological support as an external factor which can hinder sustainable online communities. One area of technological support which affects user motivation is privacy. From March 2010 to June 2011, users of Facebook in NYC who hid their friend lists increased from 17.2% to 52.6% (Dey, Jelveh, & Ross, 2012). Dey et al. (2012) believe this was due to an increase in news articles including the terms *Facebook* and *privacy* during that time period, which highlighted the risk of personal information sharing, and also to Facebook-specific issues such as users' awareness of Facebook's default settings and users' ability to adjust settings.

Hur and Hara (2007) also identified discouragement of active learning as an external factor which can hinder sustainable online communities. Among the trends

discovered by Dey et al. (2012) was that women have higher level privacy settings than men, young and middle-aged users have higher level privacy settings than older people, and people living in wealthier areas tend to have higher privacy settings than those living in less wealthy areas. While privacy settings are not believed to be influenced by friends' settings, this informs potential motivational influences to privacy settings (Dey et al., 2012). Comments from participants in Davis's (2012) study of teachers utilizing Twitter for professional development corroborates this discouragement factor, which can be the result of misperceptions surrounding the use of online communities for professional development. Some teachers felt discouraged from participation in the online professional development community by both peers and administrators because of their beliefs that online networks could not be useful outside of social networking situations (Davis, 2012).

Alleviating these negative motivations can increase healthy social interactions activities including relationship building, solving problems, and helping others. Also, healthy information exchange factors such as perceived importance of content, willingness to share, desire for information, and privacy protection, can be enhanced, along with healthy individual/organization value attributes including sense of control, sense of belonging, and collaborative inquiry. Figure 18 shows potential benefits of combatting negative external motivations.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Relationship Building	Users create bonds and friendships
Solving Problems	Users provide viable solutions
Helping Others	User's actions contribute to other user's success
Information Exchange	**Healthy Factors**
Perceived Importance of Content	Content is perceived by users as important
Willingness to Share	Users are open to sharing for the benefit of the group
Desire for Information	Users actively pursue information from other users
Privacy Protection	User is protected and informed regarding their privacy
Individual/Organizational Values	**Healthy Attributes**
Sense of Control	Users have positive sense of autonomy
Sense of Belonging	Users feel like members of a larger community
Collaborative Inquiry	Users use other users as information resources
Action Mobilization	Users can garner support for change

Figure 18. Combatting Negative Motivations—External

2. Role of the Moderator

Moderators have an opportunity to positively affect the health of the online community they moderate. They can deter unhealthy activities during social interactions, increase the likelihood that healthy community attributes are associated with the values of individual users and the organization, and promote healthy factors for information exchange.

a. Informing the Moderator Role

The moderator is key to supporting community health. The job of an online community moderator is not cookie cutter and not all moderators are created equal. The moderator role is one that affects community functioning through management of tech support, group processes, and the social aspects of the community (Gray, 2004). Moderating an online community is complex, diverse, necessary, messy, and influenced by both the moderator and those being moderated (Grimmelmann, 2015). Moderator presence in online environment enables a community to develop from an information-sharing forum to a knowledge construction and shared learning community of practice (Gray, 2004). For organizations looking to take advantage of some of the benefits described in the previous productivity needs section, the moderator role is instrumental.

While some moderators are better than others, the responsibility of a moderator is ambiguous at best. Moderators are even protected from potentially damaging action/ inaction in certain situations. One protection moderators have that insulates them from responsibility of the development of unhealthy online communities is Communications Decency Act § 230. The Communications Decency Act § 230 immunizes providers and users of a service from being treated as the publisher of content and protects moderators who restrict access to material that may be viewed as objectionable in their moderation efforts (Grimmelmann, 2015). This protection extends to moderation techniques that encourage posting of content and techniques that restrict content (Grimmelmann, 2015). Despite these protections, online communities and the organizations that sponsor them can install individuals into the moderator position who will work to ensure a positive online community experience.

b. Moderator Impact Actions

Moderators, through various actions can have direct impact on community health. We identified three broad categories through which moderators can influence their community: Content Monitoring, Increasing User Commitment, and Increasing Participation.

(1) Content Monitoring

The responsibility for monitoring content may be the responsibility of moderators or managers of organizations. Moderators or managers are sometimes tasked with reviewing and verifying information before it may be posted to online communities of practice, largely to ensure accuracy of the information and ensure security and confidentiality requirements are being met (Ardichvili et al., 2003). Though this process can be a hindrance to timely content availability as content verification for accuracy can be time consuming, the resultant accuracy gained by users and organizations may increase the health associated with the quality content attribute. Additionally, moderators can monitor and potentially deter unhealthy social interactions and foster healthy activities within the online community to increase the likelihood of achieving a

community with social interactions consisting of the healthy activities and yielding the healthy attributes presented in Figure 19.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Communicating Clearly	Messages are received and understood as intended
Engaging in Conflict	Constructive conflict provides opportunity for growth
Relationship Building	Users create bonds and friendships
Solving Problems	Users provide viable solutions
Helping Others	User's actions contribute to other user's success
Exhibiting Thoughtfulness	Communicating/acting with considerations of others
Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Displaying Encouragement	Users actively encourage other users
Expressing Empathy	Users display compassion, sympathy , and warmth
Experiencing Fun	Users enjoy the online social interaction
Individual/Organizational Values	**Healthy Attributes**
Quality Content	Accurate content exchange

Figure 19. Moderator Impact—Monitoring

(2) Increasing User Commitment

Users of online communities continue to participate or are committed to participation in online communities for different reasons. As discussed in the User Motivation action area, Bateman et al. (2011) identified three psychological motivation categories that explain an individual's commitment to a community: normative, continuance, and affective. Managers or moderators of online communities, if tuned into what psychologically bonds its members to the community may effectively be able to use the psychological motivation of a user to nurture the community itself. For example, while not as effective with normative community commitment motivated individuals, managers can motivate individuals with continuance community commitment and affective community commitment by stimulating desired behaviors to increase participation and help their communities grow in a healthy way (Bateman et al., 2011). Community managers can increase affective community commitment by fostering community identity in areas of values, interests, and goals (Bateman et al., 2011). Through use of survey or focus groups, managers/moderators can increase continuance

community commitment and encourage participation in communities by intentionally identifying the type of content members are interested in and creating new discussion topics in stimulating or even controversial high value topics and communicating to the community the benefits of that content (Bateman et al., 2011). A moderator who seeks to understand what users value and are interested in may be able to increase the healthy factors associated with the perceived importance of content, willingness to share, and desire for information. Additionally, a moderator's focus on fostering community identity based on the values of users may contribute to an increase in the health of all of the individual/organizational values attributes identified in Figure 20.

Information Exchange	Healthy Factors
Perceived Importance of Content	Content is perceived by users as important
Willingness to Share	Users are open to sharing for the benefit of the group
Desire for Information	Users actively pursue information from other users
Individual/Organizational Values	**Healthy Attributes**
Personal Fulfillment	User participation enhances personal gratification
Sense of Control	Users have positive sense of autonomy
Emotional Support	Users provide each other emotional support
Sense of Belonging	Users feel like members of a larger community
Quality Content	Accurate content exchange
Goal Achievement	Both users and group goals are accomplishment
Reflective Thinking	Reflective thinking encouraged as ideas are exchanged
Collaborative Inquiry	Users use other users as information resources
Action Mobilization	Users can garner support for change

Figure 20. Moderator Impact—Increasing Commitment

(3) Increasing Participation

As moderators increase community commitment, they can also affect participation. Amado and Veloso (2012) advocate for putting processes in place to spur sharing and creation of content through strategies, documentation, and policies. Moderators have the ability to keep interactions engaging and exciting, can move conversations along when they become stale, and can generate participation through methods including seasonal online surveys, the scheduling of live chats, the opening of new discussion threads, and prompting of participation through personal emails to users

regarding topics relevant to the user's experience or interests (Gray, 2004). A moderator who is paying attention to what the community needs and takes action to increase active participation in these ways can increase the healthy activity of active participation and the healthy factors associated with perceived importance of content, willingness to share, desire for information, and throughput of information as identified in Figure 21.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Information Exchange	**Healthy Factors**
Perceived Importance of Content	Content is perceived by users as important
Willingness to Share	Users are open to sharing for the benefit of the group
Desire for Information	Users actively pursue information from other users
Throughput of Information	Managed flow of desired content without overload

Figure 21. Moderator Impact—Increasing Participation

3. Community Characteristics

The final healthy online community action area, community characteristics, speaks to the nature of the community itself and its impact on the rest of the system. Iriberri and Leroy (2009) suggested that components at each of the first four stages of an online community's life-cycle: inception, creation, growth, and maturity can work to increase the likelihood for success of the community and avoid the final online community stage, death, resultant from a lack of contribution, participation, and quality content. A discussion of the types of attributes relevant during each of the four stages reveals potential impact areas within online communities that online community leaders may use to increase online community health.

a. Affecting Community Characteristics at Inception

During the inception stage, where the idea of an online community is prompted by a need for information, support, fun, or friendship, successful communities inject purpose, focus, codes, trademarks, and funds into the process (Iriberri & Leroy, 2009).

Amado and Veloso (2012) argued that the creative, social, and entertainment needs/motivations of users should be considered during the conceptualization of an online community in addition to the type of computer mediated communication that is expected to take place, i.e., formal/informal, synchronous/asynchronous, communicating one on one or many with many others. Attention to the needs prompting the idea for a community can increase the likelihood that the community will meet those needs.

One of the factors that contribute to a users' sense of belonging is being in the company of other users who are excited about the same things (Davis, 2012). Self-expression and sharing information contributes to personal gratification needs (Sangwan, 2005). Another community attribute deals with the make-up of the participants. Communities with shared experiences and commonalities, like recovering addicts for example, have increased likelihood that replies to others within the group will be thoughtful (Burnett & Buerkle, 2006). These groups also typically are conceived with attention being given to attributes including 24-hour availability, at will participation, perception of an anonymous and private environment, and options for whether responses can be immediate or delayed, which provides options for users to get what they need from the community when needed (Burnett & Buerkle, 2006).

The success of online communities may be based on how unique communities are from their peers. One barrier to using online communities of practice occurs when the knowledge sharing network is too similar to membership in a group that exists outside the online environment, for example, if an online community is created for employees of an organization that already work together in person every day, it's likely that a redundant method of communication like the sharing via the online community will not be chosen as a preferred method of communication over preexisting methods, i.e., walking over to the next cubicle (Ardichvili et al., 2003). A study found that when information among several online community sites overlapped substantially, the community's activities were also diminished (Zhu et al., 2014). It appears as if the colloquialism that "moderation is key" holds true in this situation.

The research findings discussed in the preceding section show that the successful communities are those that are filling the need identified in the inception stage. Attention

to the purpose for creation of an online community can focus the idea of the community on healthy activities, factors and attributes as listed in Figure 22.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Relationship Building	Users create bonds and friendships
Helping Others	User's actions contribute to other user's success
Exhibiting Thoughtfulness	Communicating/acting with considerations of others
Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Displaying Encouragement	Users actively encourage other users
Expressing Empathy	Users display compassion, sympathy , and warmth
Experiencing Fun	Users enjoy the online social interaction
Information Exchange	**Healthy Factors**
Perceived Importance of Content	Content is perceived by users as important
Willingness to Share	Users are open to sharing for the benefit of the group
Desire for Information	Users actively pursue information from other users
Privacy Protection	User is protected and informed regarding their privacy
Accessibility	Content is available when needed
Throughput of Information	Managed flow of desired content without overload
Individual/Organizational Values	**Healthy Attributes**
Personal Fulfillment	User participation enhances personal gratification
Sense of Control	Users have positive sense of autonomy
Emotional Support	Users provide each other emotional support
Sense of Belonging	Users feel like members of a larger community

Figure 22. Community Characteristics Impact—Inception Stage

b. Affecting Community Characteristics at Creation

During the creation stage, in which the purpose is combined with the technology and the people, user-centered usability, security, and reliability should be built into the system (Iriberri & Leroy, 2009).

(1) User-Centered Usability

Usability can be enhanced through focus on the contextual, functional, and emotive needs of the online platform. Functional needs might be met by purposefully building in access to desired information, and emotive needs might be met by creating the space for expression of feelings as mentioned previously. Contextual needs including

navigation of a site, and a site's aesthetics can represent needs other than functional and emotive needs that can be designed into a system (Sangwan, 2005). One potentially limiting factor for participation in online communities is the technical limitation on number of posts within a certain time period or the maximum space allotted for a posting, for example, the 140-character microblog limitation employed by Twitter (Davis, 2012). For the purpose of enhancing the creativity inherent within online communities and using the user content to nurture the community itself, Amado and Veloso (2012) recommended incorporating content management systems with robust open standards focused on the need of the users during development.

(2) Security

Security can be enhanced during the creation stage by building in privacy protection. Default privacy settings in many online communities typically grant privileges to three groups (user, users friends, or all users) for the various categories that may exist within an individual's account to include thumbnail, profile, friend list, user-generated content, and comments (Krishnamurthy & Wills, 2008). Despite default settings typically permitting strangers to access user information and third-party sites to track user activity, a significant portion of online social network users do not alter these default settings, allowing unknown entities and users to view their information (Krishnamurthy & Wills, 2008). The creation stage is a prime time for consideration of user security needs and establishing defaults that enhance community health.

(3) Reliability

Reliability can be built in functionally by ensuring access as needed and through thoughtful design. In the Yahoo Answers forums, discussions with longer threads and overlap of users asking and answering questions was correlated to those topics in which non-factual information was more prevalent, while conversely, short answers where users are not typically asker and answerer in the same forum produced more factual information exchange (Adamic et al., 2008). This indicates that there may be an advantage in controlling discussion thread lengths and potentially qualifying providers of information in answer-seeking forums in order to increase the quality of the content.

Incorporation of the desired ideals of the online community during the creation stage increases the likelihood the community will exhibit healthy activities, factors, and attributes as listed in Figure 23.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Relationship Building	Users create bonds and friendships
Helping Others	User's actions contribute to other user's success
Exhibiting Thoughtfulness	Communicating/acting with considerations of others
Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Displaying Encouragement	Users actively encourage other users
Expressing Empathy	Users display compassion, sympathy , and warmth
Experiencing Fun	Users enjoy the online social interaction
Information Exchange	**Healthy Factors**
Perceived Importance of Content	Content is perceived by users as important
Willingness to Share	Users are open to sharing for the benefit of the group
Desire for Information	Users actively pursue information from other users
Privacy Protection	User is protected and informed regarding their privacy
Accessibility	Content is available when needed
Throughput of Information	Managed flow of desired content without overload
Individual/Organizational Values	**Healthy Attributes**
Sense of Control	Users have positive sense of autonomy
Emotional Support	Users provide each other emotional support
Quality Content	Accurate content exchange
Collaborative Inquiry	Users use other users as information resources

Figure 23. Community Characteristics Impact—Creation Stage

c. Affecting Community Characteristics During Growth

During the growth stage, where rules, roles, and identity are established within the group, quality content, new users, integration, trust, and interaction are key components needed (Iriberri & Leroy, 2009). Communities that purposefully build reflection, diversity, and quality content into the community dynamic can ensure healthy instead of unhealthy community development.

(1) Reflection

The online environment allows users to more carefully craft thoughts before submission to an audience than would be possible in person allowing for clearer and more profound expressions (Burnett & Buerkle, 2006). Communities that are built on agendas steeped in reflection and in taking time to ensure long-term growth and benefit can avoid negative associations with quick reactions (Kollosche, 2014). Additionally, online environments can encourage participants to self-reflect on strategies and decisions they make. In Davis's (2012) study involving teachers using online communities for professional development, the interactions caused participants to reflect on their own teaching strategies. Online environments where conversations can occur that spark reflective thinking is a desirable attribute for healthy communities.

(2) Diversity

Diversity within a group can be fostered through recruitment and through the embracing of the diversity present within a community. One of the online community factors valued by 94% of participants in Davis's (2012) study was diverse perspectives and experiences within the online community. Diverse perspectives and experiences within an online community contribute to the enrichment of one's professional development (Davis, 2012). Online environments where diversity is encouraged supports healthier interactions and value gained from community users.

(3) Quality Content

Quality content within an online community can keep users engaged in an online community as a source of information and can attract other users. Sangwan's (2005) study reported that one of the functional needs users expect in the online environment is objective and reliable sources of information. Users want to participate in communities that provide them value; reliable information is arguably more valuable than unreliable information. Sometimes the content might be less quality not because of its accuracy, but because of the type of problem the content is addressing. For example, when process-oriented problems arise that are not easily duplicated, it may be more difficult for the knowledge-sharing community to provide a solution, as solutions to process-oriented

problems often are needed quickly. This desire for quick information can result in either inaccurate information or too many answers/solutions to the problem creating further time requirements, potentially eliminating the usefulness of the responses (Ardichvili et al., 2003).

A list of activities, factors, and attributes that are affected during the community growth phase is presented in Figure 24.

Social Interactions	Healthy Activities
Participating Actively	Users regularly participate in online community
Communicating Clearly	Messages are received and understood as intended
Engaging in Conflict	Constructive conflict provides opportunity for growth
Relationship Building	Users create bonds and friendships
Solving Problems	Users provide viable solutions
Helping Others	User's actions contribute to other user's success
Exhibiting Thoughtfulness	Communicating/acting with considerations of others
Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Displaying Encouragement	Users actively encourage other users
Expressing Empathy	Users display compassion, sympathy , and warmth
Experiencing Fun	Users enjoy the online social interaction
Information Exchange	**Healthy Factors**
Perceived Importance of Content	Content is perceived by users as important
Willingness to Share	Users are open to sharing for the benefit of the group
Desire for Information	Users actively pursue information from other users
Privacy Protection	User is protected and informed regarding their privacy
Accessibility	Content is available when needed
Throughput of Information	Managed flow of desired content without overload
Individual/Organizational Values	**Healthy Attributes**
Quality Content	Accurate content exchange
Reflective Thinking	Reflective thinking encouraged as ideas are exchanged
Collaborative Inquiry	Users use other users as information resources

Figure 24. Community Characteristics Impact—Growth Stage

d. Affecting Community Characteristics at Maturity

During the maturity stage, where regulations, subgroups, and trust relationships form, insertion of events, permeated control, rewards, and subgroups are important (Iriberri & Leroy, 2009). Examining the dynamics and processes of blogs reveal

characteristics that define community cohesion and are notably similar to those of a healthy community at a mature stage. A study noted that clear membership policies and standards of communication, facilitation by moderators, displayed profile information, identified relevant posts, and employed mechanisms of discipline when appropriate characterized community cohesion (Silva et al., 2009).

As mentioned previously, though the availability of information is a positive, control or regulation must be exercised in order to prevent the negative consequences associated with too much or not enough information flow. 70% of teachers in Davis's (2012) study perceived high information flow as a potential drawback as the flow of information at times felt overwhelming. Communities should be appropriately regulated.

The presence of subgroups within an online community allows for more specialized areas for diverse users to find the information/content they desire. In specialized technical categories within the Yahoo Answers forums, for example, identification of user responses as best, or more valued, occurred when the users providing answers focused the majority of their answers in that area as opposed to distributing their answering interests across different categories (Adamic et al., 2008). These answerers, by focusing their answers in one area may appear more likely to have subject matter expertise than a user who posts about any and everything, as these users just appear to be know-it-alls.

A mature online community might focus on healthy activities including relationship building, healthy factors including throughput of information, and rewards or healthy attributes as listed in Figure 25.

Social Interactions	Healthy Activities
Relationship Building	Users create bonds and friendships
Experiencing Fun	Users enjoy the online social interaction
Information Exchange	**Healthy Factors**
Accessibility	Content is available when needed
Throughput of Information	Managed flow of desired content without overload
Individual/Organizational Values	**Healthy Attributes**
Personal Fulfillment	User participation enhances personal gratification
Sense of Control	Users have positive sense of autonomy
Emotional Support	Users provide each other emotional support
Sense of Belonging	Users feel like members of a larger community
Quality Content	Accurate content exchange
Goal Achievement	Both users and group goals are accomplishment
Reflective Thinking	Reflective thinking encouraged as ideas are exchanged
Collaborative Inquiry	Users use other users as information resources
Action Mobilization	Users can garner support for change

Figure 25. Community Characteristics Impact—Maturity Stage

In summary, mature and healthy online communities are likely to exhibit many of the healthy activities, factors, and attributes listed in Figure 9.

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The landscape of social media use has changed over the years, and individuals and organizations are making increasing use of online communities. Online community use can result in both positive and negative outcomes. For example, an analysis of the U.S. Navy Women's Policy Facebook group found that users exchanged many types of Navy-related electronic social support (Allert, 2015). Conversely, Marines United, a private Facebook group with a stated mission of supporting active duty, retired, and former service members, included a page displaying sexually harassing comments and nude images of female service members and civilians, which in some instances, resulted in women being stalked. The events led to a public scandal, tainting the reputation of the Marine Corps, and seven Marines have been court martialed (Keller, 2017).

Despite the potentially positive outcomes of online communities, the Marines United incident demonstrates that positive outcomes can be overshadowed by incidents of deviant behavior. It is thus imperative that organizations seeking to take advantage of the potential of online communities develop understanding of their characteristics, the behaviors that constitute these characteristics, levers to support online community health, and outcomes that result from their use. We conducted a systematic meta-narrative review of the online community literature to address this need. This study contributes to the Navy's understanding on online communities by answering the following research questions.

1. What characteristics and behaviors contribute to healthy online workplace communities?

2. What are the potential community, organizational, and individual consequences of such behaviors?

3. What levers can the Navy employ to build healthy online communities?

4. How can the Navy use online communities to support overall wellbeing and community health?

A. CHARACTERISTICS AND BEHAVIORS CONTRIBUTING TO HEALTHY ONLINE WORKPLACE COMMUNITIES

Our analysis of the literature on online communities identified three components that together characterize an online community—social interactions, information exchange, and individual/organizational values. Our analysis also identified activities, factors, and attributes that characterize the components. Figure 26 summarized these findings. We further identified three overarching action areas that contribute to the building and maintaining of healthy online communities.

Online communities are characterized by the interplay of Social Interactions, Information Exchange, and Individual/Organizational Values. The activities, factors, and attributes on the right side of Figure 26 contribute to healthy online communities, whereas the activities, factors, and attributes listed on the left contribute to unhealthy online communities.

Unhealthy Activities	Social Interactions	Healthy Activities
Participation is non-existent	Participating Actively	Users regularly participate in online community
Messages are misunderstood/lost in transmission	Communicating Clearly	Messages are received and understood as intended
Conflict is destructive and hinders growth	Conflict	Constructive conflict provides opportunity for growth
Users stay to themselves/destroy relationships	Relationship Building	Users create bonds and friendships
Users provide problems/present useless solutions	Solving Problems	Users provide viable solutions
Success of other users is hindered by one's actions	Helping Others	User's actions contribute to other user's success
Communicating/acting without consideration of others	Exhibiting Thoughtfulness	Communicating/acting with considerations of others
Users chastise those who express feelings	Expressing Feelings & Emotions	Users are supportive of others expressing feelings
Users discourage other users	Displaying Encouragement	Users actively encourage other users
Users find the online social interaction unpleasant	Experiencing Fun	Users enjoy the online social interaction
Users display disdain, hatred, mercilessness, coldness	Expressing Empathy	Users display compassion, sympathy , and warmth
Unhealthy Factors	**Information Exchange**	**Healthy Factors**
Irrelevant on non-important content	Perceived Importance of Content	Content is perceived by users as important
Users hoard information that could benefit others	Willingness to Share	Users are open to sharing for the benefit of the group
Users not interested in contributions from others	Desire for Information	Users actively pursue information from other users
Privacy leakage/User content distribution ignorance	Privacy Protection	User is protected and informed regarding their privacy
Content is inaccessible when desired	Accessibility	Content is available when needed
Too much or too little content availability	Throughput of Information	Managed flow of desired content without overload
Unhealthy Attributes	**Individual/Organizational Values**	**Healthy Attributes**
User participation diminishes feelings of gratification	Personal Fulfillment	User participation enhances personal gratification
Users lack autonomy within group	Sense of Control	Users have positive sense of autonomy
Users are unsupportive of others emotionally	Emotional Support	Users provide each other emotional support
Users feel isolated	Sense of Belonging	Users feel like members of a larger community
Inaccurate content exchange	Quality Content	Accurate content exchange
Users stifle accomplishment of others	Goal Achievement	Both users and group goals are accomplishment
Reflective thinking is not encouraged	Reflective Thinking	Reflective thinking encouraged as ideas are exchanged
Users choose to remain ignorant to group knowledge	Collaborative Inquiry	Users use other users as information resources
Inability to influence change	Action Mobilization	Users can garner support for change

Figure 26. Online Community Elements—Healthy/Unhealthy Activities, Factors, and Attributes

B. CONSEQUENCES OF HEALTHY AND UNHEALTHY ONLINE COMMUNITIES

We now shift our focus from what leads to the creation and maintenance of online community health and discuss the answer to Research Question 2: What are the consequences of healthy and unhealthy online communities? The activities, factors, and attributes of online communities that characterize the components (social interactions, information exchange, and individual/organizational values) can result in positive and negative effects on individuals, groups, and organizations. For example, if users do not exhibit thoughtfulness in their social interactions, participation will likely decrease, destructive conflict can occur, fun may be diminished, people will likely be less willing to share or desire the content, and the benefits of emotional support and belonging will likely be diminished. If accessibility in information exchange is positive and content is widely available, users are likely to experience a greater sense of benefit from participating in the online community, which is in turn likely to result in an increase active participation. Finally, a user or organization that values action mobilization (the ability to garner support for change) may be more willing to communicate a cause, seek information from the group, and participate actively.

1. Consequences to Online Communities and Organizations

The happenings within an online community can affect more than individual users interacting within the community. Activities, factors and attributes, and contributing to the health of a community can affect the larger group/organization as well. This can be seen in online communities and their sponsoring organizations.

a. Consequences to Online Communities

Online communities, as a whole, are affected by the activities, factors, or attributes present within the community. The unhealthy nature of a social interaction in which users are not exhibiting thoughtfulness and where users participate in social interactions without consideration of others can be witnessed in a situation where users are consciously deceiving others and can lead to an erosion of the community. For example, when members of an online health forum discovered individuals were falsely

claiming to have ailments to garner attention from other members, the deceived members felt violated (Burnett & Buerkle, 2006). Negative experiences within online communities can erode trust within the group and negatively affect the group's willingness to share, quality of the content, sense of belonging, emotional support, relationship building, exhibiting thoughtfulness, expressing feelings and emotions, and expressing empathy, thereby reducing overall community health. In contrast, the healthy nature of a social interaction in which users exhibit thoughtfulness and are not deceptive, but instead are considerate of other users, could increase the healthy nature of the community, as the group as a whole is more likely willing to share, produce quality content, and experience the sense of belonging, emotional support, relationship building, expressions of feelings and emotions, and empathy.

b. Consequences to Organizations

Organizations benefit when they utilize online communities that exhibit healthy community characteristics, as the healthy aspects of the online community can prove valuable tools to an organization. For example, a study conducted within the multinational Caterpillar Inc. organization's online community uncovered benefits to the organization itself, including the ability to quickly access best practices, lessons learned, and information; increased efficiency; development of a link to one's own and related communities; and establishment of a location for the capture of old knowledge and the creation of new knowledge that can provide solutions to current problems and potentially be a resource for problems that have yet to fully develop (Ardichvili et al., 2003). Organizations benefit when workplaces foster online community use in healthy ways, including those associated with perceived importance of content, desire for information, solving problems, quality content, goal achievement, sense of belonging, reflective thinking, and collaborative inquiry elements. In contrast, organizations linked to online communities that exhibit unhealthy characteristics might have an unfavorable impact on the larger organization.

2. Consequences to Individual Users

Without individual users to participate in the online environment, there could be no online community. While individuals give their participation, content, and other resources to the online community, individual users also receive from the organization, be it in the form of personal fulfillment, emotional support, information, or something else. Just as the online community can be changed in a healthy or unhealthy way during this exchange between individual users and the online community, individual users can also be affected by the same interaction.

In the previous example of the deception within the online health community, the violation that affected the community as a whole was simultaneously felt at the individual level in the form of feeling violated (Burnett & Buerkle, 2006). Feelings associated with the impact other online community members have on an individual user impacts several elements including participating actively, engaging in conflict, relationship building, helping others, exhibiting thoughtfulness, displaying encouragement, experiencing fun, expressing empathy, being willing to share, desire for information, emotional support, sense of belonging, and quality content, and can greatly impact online community health. Additionally, in the previous examples of the unhealthy communities presented, there are individuals affected by the actions of those who participate in unhealthy activities or work against establishment and maintenance of healthy information exchange factors, eliminating potential benefits associated with healthy attributes online communities could provide these individuals.

The study within the Caterpillar Inc. organization, revealed the two top benefits of virtual knowledge-sharing communities of practice: (1) Employees perceived an easier integration and faster on-ramp to feeling like a productive contributor within the organization and (2) employees were increasingly able to work in different geographical areas while still communicating and working well together (Ardichvili et al., 2003). The study within the Caterpillar Inc. organization showed that organizations utilizing online communities can impact their individual employees positively. Online communities that display healthy factors associated with the willingness to share, perceived importance of content, and desire for information, paired with healthy activities including participating

actively, relationship building, and helping others, facilitate healthy attributes such as personal fulfillment, collaborative inquiry, and sense of belonging.

The effects of healthy activities, factors, and attributes are not limited to workplace online communities. Even non–work-related social networks can have an impact on both an individual's online and offline behavior. According to Althoff et al. (2016), making friends within an online social group and thereby being exposed to their activity, can influence behavior change. Their study demonstrated this phenomenon by looking at users of a fitness app where users uploaded their activity to share with online connections; the results revealed that exposure to a friend's activity increased a user's own activity (Althoff et al., 2016). Additionally, it was noted that stronger connections between the participants of this experience of social influence increases the likelihood that influence will occur (Althoff et al., 2016). This could indicate a positive relationship between the healthy activities that occur in online communities, including relationship building and participating actively and the valued benefits received by individual users including goal achievement for example. This same scenario might also be impacted by the helping others, displaying encouragement, and sense of belonging elements. In addition to activity outside the app increasing due to social influence, users of the exercise and physical activity app who participated in the social networking aspect of the app were 30% more active in the app, 17% less likely to stop using the app in a year, and 7% more physically active (Althoff et al., 2016). This hints at possible additional positive associations with the perceived importance of content factor.

C. RECOMMENDATIONS: HOW THE NAVY SHOULD ADDRESS ONLINE COMMUNITIES GOING FORWARD

The last two research questions were meant to be applicatory in nature, providing a way forward for the Navy in using online communities. With Research Question 3, we sought to identify ways in which the Navy could influence the building of healthy online communities, while through Research Question 4, we sought to identify how the Navy can use online communities to support overall wellbeing and community health. We identified three levers that can be exercised to affect the building of online community health. Additionally, we pulled from the literature several resources the Navy has, which

it may draw on to mitigate risks inherent within online communities, along with opportunities to glean benefits through their use.

1. Navy Employment of Levers to Support Healthy Online Communities

Our findings suggest three levers the Navy can employ to prevent destructive behaviors and encourage constructive behaviors in online communities: user motivation, the role of the moderator, and community characteristics, as shown in Figure 27. Within each action area are antecedents to healthy and unhealthy online behaviors. For example, within user motivation, the positive or negative motivations of users sets a tone for the activities, factor, and attributes to manifest organically before any action is taken. Likewise, the community characteristics and the moderator within an existing online community, prior to any outside influence, set a tone for un/healthy activities, factors, and attributes to occur.

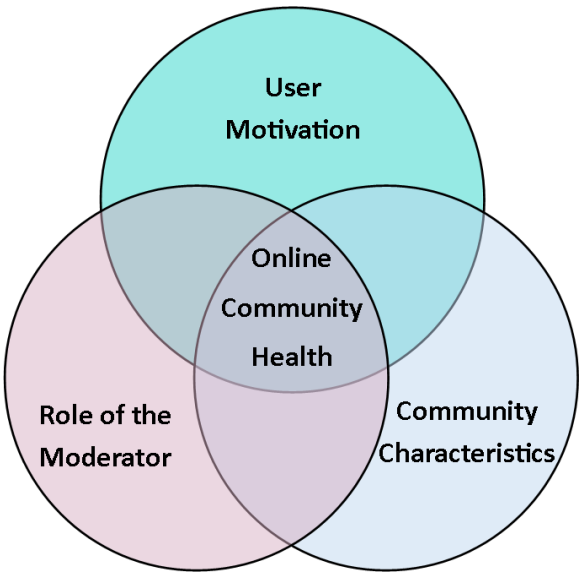

Figure 27. Online Community Action Areas

a. User Motivation

The user motivation lever is employed when organizations purposefully appeal to the positive motivations and combat the negative motivations of the users. Three

community commitment types, which typically motivate members in a positive way, are continuance commitment, affective commitment, and normative commitment. Negative motivations that can be influenced include lacking confidence, feeling discouraged due to past experiences or other people, and lack of technological support.

The Navy can appeal to the motivation of those with continuance commitment, who participate because participation benefits them in some way, by determining what it is that individuals glean from the community and providing more of it, be it personal fulfilment, emotional support, sense of belonging, or some other valued benefit. The Navy can appeal to the motivation of those with affective commitment, who participate because of an emotional attachment to the community, by fostering an environment within the online community that lends itself to development of such an attachment, perhaps by taking advantage of the affective commitment Sailors already have for their rating communities and mirroring that structure in an online domain. The Navy can appeal to the motivation of those with normative commitment, who participate because of a feeling of indebtedness or a loyalty need, by making these Sailors feel as if their contributions are aiding the organization, perhaps through recognition of their efforts.

The Navy can combat members lacking in confidence by encouraging all members to be active participants and creating a culture that encourages even novice participation. To motivate those members who may have prior experiences where participation led to less than desirable circumstances or are confronted with discouraging attitudes at present, the Navy can establish an online culture that is steeped in thoughtfulness, encouragement, and relationship building. Last, the Navy can combat issues in technological support that affect motivation by taking steps to understand user needs, especially in the privacy settings area.

b. Role of the Moderator

The role of the moderator lever is employed when organizations have individuals in place to guide the health of the community. The Navy has an opportunity to empower moderators to maintain community health by exercising the moderator role for the benefit of the organization/group.

In toxic online community The Dirty, the moderator, protected by Communications Decency Act § 230, decided what content to allow and was even permitted to comment on a defamatory post, indicating that the moderator reviewed the content but was not held accountable for contributing to the unhealthy nature of the community because the moderator did not create the original defamatory post and the moderator's post itself was not defamatory (Grimmelman, 2015). In revenge porn sites, Is Anyone Up, jailbait, and TheFappening, we see that the malicious intentions of moderators can have a negative effect on the world and can enhance users participating in criminal conduct's ability to access the desired toxic content of their choice (Grimmelman, 2015).

The Navy can combat these types of activities by ensuring that moderators are paying attention to the activities, factors, and attributes within the online community, and acting to encourage healthy elements, including sense of belonging, emotional support, privacy protection, willingness to share, experiencing fun, exhibiting thoughtfulness, and relationship building.

c. Community Characteristics

The community characteristics lever can be employed throughout the life cycle of an online community. The Navy has an opportunity at each stage, from inception to maturity, to influence the community characteristics by attending to the aspects key to success at the respective stage.

At the inception stage, the Navy should pay attention to the needs prompting the idea for creation of the community. Whether the online community is being created to fulfill a need, create a sense of belonging, provide information sharing capability, or to promote personal gratification, constructing the idea around the needs that are to be fulfilled by the online community increases the likelihood that the community will meet those needs.

During the creation stage, the Navy should marry the purpose of the community with the technology in a way that builds in user-centered usability, complete with desired information and aesthetics pleasing to the user. Security should be built in to ensure

privacy protection of the users. Last, reliability can be built in so that valued content will be available.

During the growth stage, the Navy should attempt to establish positive norms. This can be accomplished by encouraging users to be self-reflective to promote better quality interactions. The Navy should build diversity into the online community through recruitment to yield diverse perspectives and experiences. Additionally, the Navy should advocate for quality content as reliable information attracts users.

Last, during the maturity stage, the Navy should focus on regulation of the online community and maintaining active subgroups. This can be accomplished by controlling information flow to ensure desired information is available without being overwhelming. The Navy can establish subgroups within online communities tailored for diverse users to access desired content.

2. Navy Use of Online Communities: Risk, Resources, Benefits, and Opportunities

Our analysis suggests that the Navy can support healthy online communities by using Navy-specific resources to mitigate risks and opportunities to take advantage of potential benefits. As discussed, organizations, individuals, and the online communities themselves are often affected by the health of an online community. Organizations, including the U.S. Navy, seek to identify risks and resources associated with use of online communities. While this section focuses on risks, resources, and practical application of the literature within the U.S. Navy, it is possible that these recommendations may prove relevant to other organizations as well.

a. Risks and Mitigating Resources

Risks exist in each of the activity, factor, and attribute elements and manifest in the associations with the negative aspect of each identified on the left side of Figure 26. Some of the risks readily apparent in online communities include development of an unhealthy organizational culture, disinterest or a lack of participation, unauthorized access, privacy violations, and information leaks. Luckily, the Navy has some built-in resources that could be used to steer an online community towards healthier

characteristics likely to achieve the benefits suggested in the literature. These resources can be likened to the various aspects of the action areas, or levers, previously discussed and pictured in Figure 27.

(1) Developing an Unhealthy Organizational Culture

The risk of developing an unhealthy organizational culture exists within all online communities. One of the inherent resources within the Navy is an established set of values that guide the organizational culture. At Caterpillar Inc., the desire to share/ contribute was credited to the culture of the organization, which encouraged "mutually supportive relationships between employees" (Ardichvili et al., 2003, p. 69). The Navy's core values of honor, courage, and commitment are a resource that should inspire the same positive relationship if embraced by users within an online community. Users who are committed to treating their counterparts with honor and having the courage to stand up against negative interactions should encourage the development of communities that are also based on mutually supportive relationships. The Navy can utilize moderators and the design of the community/attributes of the community to highlight the Navy's standard core values to combat unhealthy culture within the online community. Additionally, online community leaders can define their online communities' values in a way that incorporates the values of the Navy paired with the intent of their commanders to provide an increased sense of direction and structure.

(2) Disinterest or Lack of Participation

Organizations sponsoring online communities want to ensure that their users perceive the content as important and desire to participate actively. Unfortunately, organizations sometimes run the risk of users losing interest in what the organization thinks the online community has to offer. Two resources, which are built into the fabric of how the Navy operates, that can address this risk are the rating structure and the administrative process every Sailor goes through during performance evaluations.

Fugelstad et al. (2012) argued that organizations should personalize their online community interface by identification and incorporation of design features within the site that appeal to the motivations of the audience and that enhance participation and

retention. This can be accomplished by seeking out new members with behavioral histories linked to participation in activities expected to benefit the entire community (Fugelstad et al., 2012). The Navy, especially the enlisted community, have a strong identity with the tradition associated with the various enlisted rates, as was evidenced by the backlash from Sailors when enlisted rates were changed in September 2016 (Faram & Larter, 2016). The Navy can positively affect user motivation by crafting subgroups within the online community that mirror this rating structure to appeal to rating-specific motivation, thus enhancing participation.

Another resource naturally available to all organizations, including the Navy, is the ability to make recommendations to users within a network. Through recommendations which connect users to what motivates them, organizations can increase engagement in an online community by taking advantage of motivations users might have to interact socially in the community or motivations to volunteer for the benefit of others (Fugelstad et al., 2012). Additionally, the Navy's use of performance evaluations, along with the ranking system embedded in the performance traits and the promotion recommendations sections of formal evaluations might be one of many tools to identify Sailors with the traits and values a community wishes to promote. The Navy can use the existing evaluation system to identify top-notch Sailors who should lead the charge in ensuring active participation in a group that includes content desired by its users.

(3) Unauthorized Access

A potential risk to many online communities is access being granted to individuals without proper verification (Felahi & Martin, 2018). The Navy, along with the rest of the Department of Defense, has a built-in resource for reducing this risk of any Navy-sponsored online communities in that all Sailors have a Common Access Card (CAC). The Navy can integrate the CAC technology into an online system, which can reduce the unauthorized access risk, as CACs are enabled with a PIN that should be known only to the servicemember.

(4) Privacy Violations

New modalities for collaborating and sharing information in online communities has increased the risk of privacy and security concern for users. One study suggested that online communities could do more to institute privacy and security by configuring settings appropriate for their users instead of relying on standard settings (Minkus & Memon, 2014). The study found that community users felt that recommended settings based on machine learning of user traits were preferred (Minkus & Memon, 2014). Perhaps the Navy can incorporate machine learning of users' patterns within online communities to establish settings based on usage or community members. The knowledge that privacy is a potential issue can be viewed as a resource that allows the Navy to make privacy setting controls more accessible and visible to users so that they are aware of the options in the interim. The Navy should utilize the resource that is the Sailors themselves and solicit input into what privacy settings they desire as a default to avoid the risk associated with inadequate privacy settings.

(5) Information Leaks

The bureaucracy within which the Navy operates requires lots of information to be shared and transmitted. Sometimes this information may be of a sensitive or classified nature, and mishandling of this information can have consequences. Since many Navy personnel operate in a world where handling of sensitive or classified information is often a norm, the Navy has already established policies and procedures for handling of this type of information. While the potential for sharing this type of information creates security risks for organizations (Ardichvili et al. 2003), the Navy's current ability to share this information via other means can be considered a resource worth maintaining, even as the use of online communities becomes more prevalent. The Navy should, therefore, maintain current standards and established procedures for handling of sensitive and classified information to avoid the risk of leaks associated with online community information sharing, at least until standards and procedures are generated to mitigate the additional potential for leaks within online communities.

b. Benefits and Opportunity for the Navy

This literature review uncovered several benefits of online communities, such as information sharing, learning, enculturation of newcomers, access to colleagues and resources. The following discussion speaks to these benefits from an application perspective. Some of these benefits, though prevalent in various types of existing online communities outside of the Navy, can potentially be gained through use of online communities to increase the health of the overall Navy community.

(1) Information Sharing

Davis's (2012) study showed that 100% of participants using an online community for professional development viewed the online community as a way of sharing knowledge, resources, information, stories, and/or best practices. A lot of corporate knowledge exists within the minds of Sailors performing tasks in various fields daily around the world. The ability for the Navy to pool the knowledge, resources, information, best practices, or lessons learned contained in these minds in a place where those in need can access it easily can potentially quicken the cycle of learning and reduce unnecessary mistakes and problems.

(2) Learning

Users of online communities have the ability to participate in learning that can increase their knowledge and technical skills and can help them to understand work practices and group norms, even in situations when the participants are only "lurkers" standing on the sidelines not actively contributing to the knowledge sharing or generation (Gray, 2004). Participation in online communities of practice can also be a tool for informal learning (Gray, 2004). Of note, 100% of participants in Davis's (2012) study perceived their participation in the online community as a means of providing professional development. The Navy, as an organization that is constantly looking to increase learning and professional development, can find benefit in online community use. The Navy is a unique organization built on the strength and values that bind it together. The Navy's online communities should reflect this. Navy leadership would be wise to reach out to social media leaders in the private sector such as Facebook, Google,

Twitter, and LinkedIn, and the designers of the military's community site milSuite to discuss potential ways to incorporate the concept of healthy online community in a way that supports the Navy's mission. Key to this initiative would be incorporating the Navy's values while considering the mission-oriented values of the diverse communities and personnel.

(3) Enculturation of Newcomers

Online communities of practice benefit from being a medium for the enculturation of newcomers, as online communities provide a means for orientation and support (Gray, 2004). Online communities can be an atmosphere where participants gain not only a sense of belonging but can view other participants as peers and develop friendships (Davis, 2012). Online communities provide users with a means of connecting to colleagues, both socially and professionally, to form a collective identity among them, complete with shared meaning/understanding of the members' work (Gray, 2004). Although the Navy has established methods of enculturation at the service level and community level (i.e., Boot Camp, Officer Candidate School, and Submarine School), additional opportunity for relationship formation and bonding exists through expansion of the amount of contacts that are possible through online communities.

(4) Access to Colleagues and Resources

A technical benefit of online communities is the instant access to colleagues and resources outside the workplace (Davis, 2012). Through online communities, Sailors and potentially prospective Sailors can get answers to questions about the service at any time. Additionally, online communities can reduce isolation related to job function or geographic location when operators are operating remotely (Gray, 2004). Online communities can allow Sailors to connect to others within their community no matter where they are in the world.

The benefits of increased wellbeing and community health resultant from participation in online communities are apparent throughout the elements of the three components of online communities identified in Figure 26. Under the social interactions component, communities benefit when members are active participants, who understand

each other, grow together, create bonds, find solutions, and aid others, in a considerate, supportive, encouraging, fun, and empathetic way. Under the information exchange component, communities benefit when members perceive the content of other members as being of valuable and available when needed, when a relationship exists where both individuals are willing to supply the information and others want the information being supplied, and the environment makes people feel safe with regard to their privacy. Under the individual/organizational values component, communities benefit when members can gain personal gratification, a sense of autonomy, emotional support, a sense of belonging, desired accurate information, increased ability to achieve goals, expanded thinking and pooling of information resources, and the ability to multiply support/action for change. Increasing these activities, factors, and attributes within online communities through application of the identified levers can cause the health of the Navy community to increase as a whole.

D. LIMITATIONS

There are several limitations associated with this study. This meta-narrative analysis was a qualitative study that focused on examining the characteristics of healthy online communities through a systematic literature review of the extant research. We created pictorial representations of the relationships among un/healthy elements (activities, factors, and attributes) of online communities and their relationship to components (social interaction, information exchange, and individual and organizational values), which together characterize online communities. It is likely that this listing of elements identified under the social interactions, information exchange, and individual/ organizational values components, are not all inclusive as they relate to online communities. The elements listed represent the characteristics of online communities and are likely just broad enough to account for elements that may not be listed. Additionally, the pictorial representation of the action areas (moderator role, community characteristics, and user motivation) likely too lacks all possible levers for influencing online community health.

Our study's design did not allow for quantification and analysis of the possible associations between and among the study variables. Nor did it allow us to produce a correlation coefficient for representing the quality of a community's overall health.

An additional limitation of this study is that it did not involve a real-world assessment of online communities. Our study did not involve a scientific study of multiple online communities to include a control group. This would have allowed us to make a more profound contribution to the literature using a method built on solid analytical principles. Additionally, as the component elements identified are affected by personality traits and values, it would have been valuable to assess and compare them to the communities in the study and their association to the correlation of variation representing the level of health of each community.

E. CONTRIBUTIONS

We contribute to the current online community literature through a comprehensive analysis of the characteristics of online communities and identification of online community component elements, which contribute to the health of an online community. Additionally, we identified action areas that may be influenced to increase online community health. We contribute to the literature by helping to fill the knowledge gap regarding healthy online communities. This research provides support and direction for future research focused on the direct assessment of online communities. It also identifies characteristics that contribute to online community health which should be further assessed.

Last, this research contributes to the Navy through its recommendations that ultimately support the Navy in creating healthy online communities and fulfilling its mission. Our literature review allowed us to identify specific organizational risks and resources that the Navy could use to prevent destructive behaviors and encourage constructive behaviors in online community environments. We discussed ways in which the Navy could use online communities to support overall community well-being and health.

F. FUTURE RESEARCH

Future research can build on this study with a model that measures the relationships between and among the variables that we have identified in our study. For example, researchers might use network analysis to study the structural relational connection between individual behaviors and community. An alternative, multiple regression may also be used to examine the relationship among variables, and the correlation of variation could be used to signify the overall health of the community.

Future research might seek to analyze the impact of the component elements being manipulated individually and in concert with others to determine the overall effect on an online community. Researchers could seek to understand how the interplay of certain social activities, information exchange factors, and attributes associated with individual/organizational values affect different types of online communities (e.g., social networking, professional development, addiction support). Researchers could also investigate the effect that changing online community health factors (user motivation, role of the moderator, and community attributes) has on the health of the various component elements. Due to ethical considerations, it might be wise for future researchers to seek out online communities that organically display some of the unhealthy activities, factors, and attributes instead of manipulating online communities in a way that can provide a less than desirable community atmosphere.

Last, future research could investigate the desired privacy settings among U.S. Navy Sailors. It may be possible to determine trends between various segments of the Navy population, and research might yield a recommendation for default privacy settings in Navy online communities.

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APPENDIX

Table 11. Articles Included in the Study. Adapted from works cited in attribution column.

Attribution	Question/Problem/Purpose	Findings
Adamic, L. A., Zhang, J., Bakshy, E., & Ackerman, M. S. (2008). Knowledge Sharing and Yahoo Answers: Everyone Knows Something. In Proceedings of the 17th international conference on World Wide Web (pp. 665–674). Beijing, China: ACM.	What are the content characteristics and patterns of interaction among users that influence knowledge sharing?	Lower entropy/higher focus, correlates with the proportion of best answers given in a category. Some users focus narrowly on specific topics, while others participate across categories. Lower entropy correlates with receiving higher answer ratings, but only for categories where factual expertise is primarily sought after.
Almakky, H. G. A. (2017). Facebook User Interface Design to Suit the Saudi Arabian Culture (Thesis). Bournemouth University. Retrieved from http://eprints.bournemouth.ac.uk/29627/8/ALMAKKY%2C%20Hana%20Ghazy%20A._Ph.D._2017.pdf	How does the misalignment between the original user interface of Facebook (development in the USA) and its Arabic version affect Saudi Arabian user's perception, expectations, attitudes and behavior?	Saudi attitudes and behaviors towards Facebook were negative due to inherent cultural beliefs and preferences, which led Saudi users to cite issues with the complexity of the page and the level of information available on certain pages. Saudi users prefer icons that are clearly recognizable. The Facebook interface included inaccurate English to Arabic translations, inappropriate positioning of text and menus, as well as an incorrect calendar types, which resulted in overall avoidance amongst some Saudi Arabians. To avoid future design problems, a new design guideline has been proposed in the current study
Althoff, T., Jindal, P., & Leskovec, J. (2017). Online Actions with Offline Impact: How Online Social Networks Influence Online and Offline User Behavior. In *Proceedings of the Tenth ACM International Conference on Web Search and Data Mining* (pp. 537–546). New York, NY: ACM. https://doi.org/10.1145/3018661.3018672	How social do networks influence user behavior in a physical activity tracking application?	The creation of new social connections increases user online in-application activity by 30%, user retention by 17%, and user offline real-world physical activity by 7% (about 400 steps per day). Social influence accounts for 55% of observed changes in user behavior. The remaining 45% can be explained by the user's increased motivation to use the app. Subsequent, individual edge formations in the social network lead to significant increases in daily steps.
Amado, P., & Veloso, A. (2012). Participatory Design of an Online Community: A Virtual Community of Practice for Vector Drawing. Poster.	What CMC (Computer Mediated Communication) modes most influence the OC (Online Communities) devoted to the creation of static vector and bitmap	When conceptualizing an OC for visual creation, the implementation of different modes of CMC should be calibrated by the specific needs of the users–the greater the specialization, the less the need for different CMC modes. In addition, the creation, social and

Attribution	Question/Problem/Purpose	Findings
	multimedia artifacts; and what methodology can improve creating and maintaining an OC for the creation of visual artefacts?	entertainment aspects of the community should be well balanced. Users divide their motivations between information seeking and providing, content creation and entertainment seeking. COCs should: 1) use a robust open standards CMS system; 2) implement simple, configurable DMI tools; 3) develop documentation, strategies and policies to stimulate the creation and sharing of users' content to nurture the community.
Andrews, D. C. (2002). Audience-specific online community design. *Communications of the ACM, 45*(4), 64–68. https://doi.org/10.1145/505248.505275	What are online community design approaches for specific audiences?	A thorough understanding of an audience's distinctive demographic, psych demographic, and Internet experience characteristics are critical to crafting solutions that increase the ability to build sustainable online communities.
Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management, 7*(1), 64–77.	(1) What are the reasons for employees' willingness to contribute their knowledge to virtual knowledge-sharing communities of practice? (2) What are the barriers to employees' contributing their knowledge to virtual knowledge-sharing communities? (3) What are the reasons for employees' willingness to use virtual knowledge-sharing communities of practice as a source of new knowledge? (4) What are the barriers preventing employees from using virtual knowledge-sharing communities as a source of new knowledge?	Whenemployees view knowle dge as a public good belonging to the whole organization, knowledge flows easily. However, even when individuals give the highest priority to the interests of the organization and of their community, they tend to shy away from contributing knowledge .. Specifically, employees hesitate to contribute out of fear of criticism, or of misleading the community members (not being sure that their contributions are important, or completely accurate, or relevant to a specific discussion).
Auyeung, L. H. (2004). Building a Collaborative Online Learning Community: A Case Study in Hong Kong. *Journal of Educational Computing Research*, *31*(2), 119–136.	Can on-line communities support reasoning skills?	By partaking in a dialogue, students can develop and sharpen their reasoning skills. It is therefore essential to engage students in an interactive pedagogy to transform them from simple recipients of information to original contributors of deeper quality responses. It was found that more than 90% of students reported that they gained from either actively participating in the online discussion or from just reading others' messages.
Baltes, B. B., Dickson, M. W., Sherman, M. P., Bauer, C. C., & LaGanke, J. S. (2002). Computer-Mediated	What are the effects of CMC on: decision quality, time to decision, and member satisfaction?	Computer-mediated communication leads to decreases in group effectiveness, increases in time required to complete tasks, and decreases in member satisfaction compared to face-to-face groups.

Attribution	Question/Problem/Purpose	Findings
Communication and Group Decision Making: A Meta-Analysis. *Organizational Behavior and Human Decision Processes*, *87*(1), 156–179. https://doi.org/10.1006/obhd.2001.2961.		All the moderators tested (anonymity in the group process, limited versus unlimited time to reach decisions, group size, and task type) were significant for at least one of the dependent variables.
Barab, S. A., MaKinster, J. G., Moore, J. A., & Cunningham, D. J. (2001). Designing and building an on-line community: The struggle to support sociability in the Inquiry Learning Forum. *Educational Technology, Research and Development, 49*(4), 71–96.	How did we instantiate our pedagogical commitments and to describe the challenges we faced during the design, development, implementation, and analysis of the ILF?	This paper describes the sociotechnical structures of our on-line professional development environment designed to support secondary mathematics and science teachers in sharing, discussing, and evolving their practice. Getting students to see ILF usage as more than an assignment will prove to be a challenge.
Bateman, P. J., Gray, P. H., & Butler, B. S. (2011). The Impact of Community Commitment on Participation in Online Communities. *Information Systems Research*, *22*(4), 841–854. https://doi.org/10.1287/isre.1090.0265	Why would an individual choose to return repeatedly to a particular community and engage in the various behaviors that are necessary to keep conversation within the community going?	Each form of community commitment has a unique impact on each behavior, with need-based commitment predicting thread reading, affect-based commitment predicting reply posting and moderating behaviors, and obligation-based commitment predicting only moderating behavior.
Berkelaar, B. (2011). Peering Behind the Curtain: The Virtual Wizard Offers No Guarantees. In Virtual Sociability: From Community to Communitas (Vol. 1, pp. 59–83). InterAcademic Press.	What is the basic plot and some of the main characters associated with online sociability research and conceptions of virtual or online communities?	Designers need to appreciate the context, fundamental assumptions, and research that can inform design.
Boll, F., Brune, P., & Gewald, H. (2017). Towards your parents' social network platform – A user interface for the age of retirement. In Proceedings of the 50th Hawaii International Conference on System Sciences (pp. 3725–3734). Retrieved from https://scholarspace.manoa.hawaii.edu/bitstream/10125/41608/1/paper0459.pdf	Can user interface design for online social networks overcome the usability issues due to user interface to aid in adoption by those transitioning from working life to retirement?	With specific but limited adjustments of typical UI elements, OSN could be made better suitable for people in the transition age.
Burnett, G., & Buerkle, H. (2006). Information Exchange in Virtual Communities: A Comparative Study. *Journal of Computer-Mediated*	Can analysis of the differences in types of posts across virtual communities give us a mechanism through which we can understand more clearly the role that	Minor revisions must be made to the typology if it is to reflect more accurately the range of behaviors to be found within virtual communities. Limitations of the typology–its inability to account for the temporal dimension of virtual community interactions, the role

Attribution	Question/Problem/Purpose	Findings
Communication, *9*(2), 00–00. https://doi.org/10.1111/j.1083-6101.2004.tb00286.x	information and information behavior plays in the social environments we call virtual communities?	played by a community's perceptions of the meaning of certain types of posts, and non-public interactions between community members–cannot be ameliorated by simple revisions but require additional descriptive analysis. The typology should not stand by itself as the sole tool for analyzing virtual communities but should always be accompanied by interpretive and descriptive commentary.
Cha, M., Haddadi, H., Benevenuto, F., & Gummadi, K. P. (2010). Measuring User Influence in Twitter: The Million Follower Fallacy. In Fourth International AAAI Conference on Weblogs and Social Media (pp. 10–17).	How the three types of influential users performed in spreading popular news topics?	Popular users who have high indegree are not necessarily influential in terms of spawning retweets or mentions. Second, most influential users can hold significant influence over a variety of topics. Third, influence is not gained spontaneously or accidentally, but through concerted effort such as limiting tweets to a single topic.
Cheng, R., & Vassileva, J. (2006). Design and evaluation of an adaptive incentive mechanism for sustained educational online communities. *User Modeling and User - Adapted Interaction; Dordrecht, 16*(3–4), 321–348. http://dx.doi.org/10.1007/s11257-006-9013-6	Will the users in the test group rate articles more actively? • How well will the summative ratings reflect the real quality of the articles? • Will the users tend to share resources earlier in the week? • Will the actual number of contributions be close to the desired one? • Will the users share the number of articles that is expected from them? • Will the users contribute a higher percentage of high-quality articles? • Will there be information overload?	The users in the test group were more active in rating articles. The articles with higher ratings were more likely to be chosen by users to summarize The users in the test group were more satisfied with the summative ratings received by their articles The users in the test group tended to share resources earlier in the week There was no big difference between the total numbers of shared articles across the two groups: In the test group, more than half of the users tried to share the number of articles that was expected from them. the overall number of articles in the test group was not excessive There was no big difference between the total numbers of shared articles across the two groups: In the test group, more than half of the users tried to share the number of articles that was expected from them. The overall number of articles in the test group was not excessive There was no big difference between the total numbers of shared articles across the two groups: In the test group, more than half of the users tried to share the number of articles that was expected from them
Cole, H., & Griffiths, M. D. (2007). Social Interactions in Massively Multiplayer Online Role-Playing Gamers. *CyberPsychology & Behavior, 10*(4), 575–583. https://doi.org/10.1089/cpb.2007.9988.	What are the positive social aspects of MMORPGs?	The study showed MMORPGs can be extremely social games, with high percentages of gamers making life-long friends and partners. It was concluded that virtual gaming may allow players to express themselves in ways they may not feel comfortable doing in real life because of their appearance, gender, sexuality, and/or age. MMORPGs also offer a place where teamwork, encouragement, and fun can be experienced.
Davis, K. J. (2012). *Learning in 140 Characters: Teachers' Perceptions of*	(1) How do U.S. K-12 public school teacher use Twitter, a social networking	Regardless of teachers' feelings toward their workplace, participants believed participation promoted sense of belonging and positive

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Twitter for Professional Development (Ed.D.). Available from Dissertations & Theses @ University of Phoenix; ProQuest Dissertations & Theses Global. (1220692954)., United States -- Arizona. Retrieved from https://search-proquest-com.contentproxy.phoenix.edu/docview/1220692954?accountid=134061.	website, for professional development? (2) How do U.S. K-12 public school teachers perceive participation in a subnetwork of Twitter as contributing to an online community of practice? (3) What are the benefits or drawbacks to U.S. K-12 public school teachers who use Twitter as a means for professional development?	attitudes toward teaching. Study findings included teachers' perceptions of the technical benefits and drawbacks related to using a social network site for professional development. Findings for this study included the digital habitat for teacher professional development and social network sites model, a guide for educational leaders in understanding how and why a social network site may support teacher professional development.
Dey, R., Jelveh, Z., & Ross, K. (2012). Facebook users have become much more private: A large-scale study. In 2012 IEEE International Conference on Pervasive Computing and Communications Workshops (pp. 346–352). https://doi.org/10.1109/PerComW.2012.6197508	examine if there What are trends in the information Facebook users reveal about themselves on their public profile pages since early 2010?	NYC users have become dramatically more private. In March 2010 only 17.2% of the users in our sample hid their friend list, whereas in June 2011, just 15 months later, 52.6% of them hid their friend lists. In March 2010, for 12.3% of the users, all the attributes in Table II were private, whereas in June 2011, for 33% of the users, all these attributes were private. Women tend to be more private than men, and that young and middle-aged people tend to be more private than older users. People living in the wealthier boroughs and in boroughs with more US-born users tend to be more privacy conscious. We have found that people's decisions to be private are not significantly influenced by their friends' decisions.
Dubé, L., Bourhis, A., & Jacob, R. (2005). The impact of structuring characteristics on the launching of virtual communities of practice. *Journal of Organizational Change Management; Bradford, 18*(2), 145–166.	vHow can virtual communities of practice (VCoPs), be intentionally formed, developed and sustained?	The environment, the relevance of the VCoP's objectives to its members' daily work, and the degree to which the VCoP is embedded in the organizational structure of an organization are the three structuring characteristics most likely to explain the success or failure of a VCoP at the launching stage.
Ehrlich, K., Muller, M., Matthews, T., Guy, I., & Ronen, I. (2014). What motivates members to contribute to enterprise online communities? (pp. 149–152). ACM Press. https://doi.org/10.1145/2556420.2556477.	What motivates community members to contribute to an enterprise online community when people who provide no visible contribution can enjoy the same readership privileges and where the time and effor devoted to the community competes with other more pressing business priorities?	First, while informal leaders were motivated by wanting to help others and by gaining access to informational resources [1-3, 5] they limited their participation to the community directly related to their daily work. This approach directed participation where it was most likely to be effective and have direct personal benefit. Second, informal leaders were often deliberate in eliciting others to contribute to the community as a way of generating new valued information. Third, contrary to previous research there was little support that participants were motivated to contribute to the community to enhance their online reputation. Nor was there support for social benefits such as building more or stronger relationships with individuals in the community.. Informal leaders were not motivated by extrinsic factors such as

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		individual performance goals and reviews. There was no evidence that these factors motivated contributions although recognition was appreciated.
Erickson, T., & Kellogg, W. A. (2000). Social translucence: an approach to designing systems that support social processes. *ACM Transactions on Computer-Human Interaction, 7*(1), 59–83. https://doi.org/10.1145/344949.345004	How can we design systems to support communication and collaboration among large groups of people over computer networks?	The digital world appears to be populated by technologies that impose walls between people, rather than by technologies that create windows between them. We suggest that understanding how to design digital systems so that they mesh with human behavior at the individual and collective levels is of immense importance. By allowing users to "see" one another, to make inferences about the activities of others, to imitate one another, we believe that digital systems can become environments in which new social forms can be invented, adopted, adapted, and propagated—eventually supporting the same sort of social innovation and diversity that can be observed in physically based cultures.
Farkas, M. (2007). Social software in libraries: Building collaboration, communication, and community online. Medford, UNITED STATES: Information Today, Inc. Retrieved from http://ebookcentral.proquest.com/lib/ebook-nps/detail.action?docID=3316141		
Felahi, R., & Märtin, M. (2018). Understanding Social Networks. Retrieved from https://pdfs.semanticscholar.org/e273/88990656500c867a225480928e7b2216064f.pdf	Can decentralization solve problems of privacy, data portability and policies without creating others?	Some of the drawbacks such as, usability, security, maintainability and economical disadvantages that can derive from adopting a distributed architecture for social networks. In the future the social aspect will be integrated with ubiquitous computing across all applications and devices.
Fugelstad, P., Dwyer, P., Moses, J. F., Kim, J., Mannino, C. A., Terveen, L., & Snyder, M. (2012). What makes users rate (share, tag, edit...)? predicting patterns of participation in online communities. In *CSCW '12* (pp. 969–978). Seattle, WA: ACM.	Can we predict who will participate in an online community? What activities are specific individuals most likely to engage in?	Both general and community-specific motives predicted the most basic form of participation, simply logging in. Specifically, the two general VFI motives, a personal history of altruistic behavior, and the community-specific motive of receiving accurate recommendations each predicted logging into the site. Interestingly, other oriented volunteer motivation predicted more logins, whereas self- oriented volunteer motivation and altruistic behavior negatively predicted logins. Consistent with functional theorizing, we found that different motivations, and different histories of pro-social behavior, led to different patterns of behavior. Q&A forums allow users to ask/answer

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		questions for other users about the site or movies. Users' pro-social behavioral histories also were related to specific patterns of behavior in MovieLens. People with more volunteer experience were more likely to edit movies.
Goyal, A., Bonchi, F., & Lakshmanan, L. V. S. (2010). Learning influence probabilities in social networks. In *Proceedings of the third ACM international conference on Web search and data mining* (pp. 241–250). ACM Press. https://doi.org/10.1145/1718487.1718518	From a social graph and a log of actions by its users, can one build models of influence?	In addition to predicting whether a user will perform an action, we also observed that the predictions of our algorithms on users with a high influenceability score tend to have a high precision. We can predict the time by which an influenced user will perform an action after its neighbors have performed the action. Our experiments also show that while testing the proposed continuous time model is very expensive, the discrete time model can be tested much more efficiently and yet can yield accuracy levels very close to that of the continuous time model.
Gray, B. (2004). Informal Learning in an Online Community of Practice: [1]. *Journal of Distance Education; Ottawa*, *19*(1), 20–35.	What role can online communities play in meeting the informal learning need of a professional association?	The role of the online moderator was identified as critical in sustaining the online community over an extended period and enhancing the learning function.
Grimmelmann, J. (2015). The Virtues of Moderation. *Yale Journal of Law and Technology*, *17*(1), 42–109.	How does the "the free encyclopedia that anyone can edit" stave off abuse while maintaining its core commitment to open participation?	This Article provides a novel taxonomy of moderation in online communities. It breaks down the basic verbs of moderation—exclusion, pricing, organizing, and norm-setting—and shows how they help communities walk the tightrope between the chaos of too much freedom and the sterility of too much control.
Guy, I., Ronen, I., Kravi, E., & Barnea, M. (2016). Increasing activity in enterprise online communities using content recommendation. *ACM Transactions on Computer-Human Interaction, 23*(4), 1–28. https://doi.org/10.1145/2910581	RT1: Compare the effectiveness of member-based, content-based, and hybrid profiles for recommendation sharing by owners RT2: Examine the effect of different characteristics of the community and the recommended items on recommendation effectiveness RT3: Examine the effect of recommendations on community activity in the weeks that follow, relative to the control group who received no recommendations.	When it comes to sharing willingness and action, the content of the community, as reflected through its title, description, and tags, plays a central role and is vital for producing recommendations owners would share. This is especially true for smaller and younger communities. Although recommendation is effective across all item types, bookmarks and blogs are the most productive. Presentation of related people and tags contributes to owners' willingness to share items. Our experiments show a clear and significant effect of the recommendation on community activity over a period of eight weeks. Content recommendation to owners can serve as an effective means for boosting participation and contribution in enterprise online communities.
Harley, D., Howland, K., Harris, E., & Redlich, C. (2014). Online communities	What is the significance of family and local community connections in determining	A better understanding of the four catalysts identified (family, roles, loss, spaces and places) is important if we are to provide greater

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for older users: what can we learn from local community interactions to create social sites that work for older people. In Proceedings of the 28th International BCS Human Computer Interaction Conference (pp. 42–51). Southport, UK: BCS Learning and Development Ltd.	online community engagement amongst a sample of older people in the south of England?	opportunities for community engagement by older people through online communities and SNS.
Hur, J. W., & Hara, N. (2007). Factors Cultivating Sustainable Online Communities for K-12 Teacher Professional Development. *Journal of Educational Computing Research*, *36*(3), 245–268.	What are the factors that affect fostering a sustainable online community for K-12 teacher professional development?	Internal factors, such as having a sense of ownership and autonomy and acknowledging the value of participation, played a significant role in the growth of INDISCHOOL. The value of teachers' participation was related to their belief that active involvement in INDISCHOOL improves student learning. These teachers also reported that INDISCHOOL participation is a valuable part of their professional development.
Iacob, C. (2011). Identifying, relating, and evaluating design patterns for the design of software for synchronous collaboration. In Proceedings of the 3rd ACM SIGCHI symposium on Engineering interactive computing systems (pp. 323–326). Pisa, Italy: ACM Press.	What design patterns can be identified in the design of software systems which support synchronous collaboration? What relationships exist between the design patterns identified? What is the impact of using these patterns by teams of software designers?	This work provides a better understanding of the design issues to be faced during the design of synchronous collaborative systems. Thus, far, I have identified a set of design patterns for the design of software systems to support synchronous collaboration together with the relationships between them. Also, I have implemented a prototype application able to answer queries on the knowledge base representing the patterns.
Iriberri, A., & Leroy, G. (2009). A life-cycle perspective on online community success. *ACM Computing Surveys (CSUR)*, 41(2), 1–29. doi:10.1145/1459352.1459356	What are they online community development processes and what guidelines will introduce success factors and design choices in an integrated and orderly way?	
Joon Koh, Young-Gul Kim, Butler, B., & Gee-Woo Bock. (2007). Encouraging Participation in Virtual Communities. *Communications of the ACM*, *50*(2), 69–73.	What drivers are most likely to stimulate a virtual community?	Offline interaction and usefulness variables had appreciable effects on virtual community activity variables.
Jutla, D. N. (2010). Layering privacy on operating systems, social networks, and other platforms by design. *Identity in the Information Society, 3*(2), 319–341. https://doi.org/10.1007/s12394-010-0057-	In the OSN environment, do users care about privacy and its long-held status as a social norm?	This paper introduces a privacy life cycle concept from the user perspective thereby contributing to the classification theory for online privacy management and technologies.

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Kirk, M. (2009). Language as Social Institution: The Male-Centered IT Culture. In *Gc* (pp. 119–142). IGI Global.		N/A
Kling, R., & Courtright, C. (2003). Group behavior and learning in electronic forums: A sociotechnical approach. *Information Society, 19*(3), 221–235.	How does group behavior in e-forums could be supported to meet the kinds of aspirations of trust and reciprocity that people who use the term communitydesire?	We have illustrated two approaches to building online groups that differ sharply. The original ILF strategy of bringing teachers together via discussions of classrooms illustrates “IT-led group development.” In contrast, the bounded groups illustrate “IT-supported group development.” The IT-led strategies are much more difficult to make workable. In contrast, effective IT-supported groups are very common, since they do not require that the various and complex processes of group formation and group development rely principally on an electronic forum. Instead, the role of the e-forum is to enhance, extend, and support wider group processes and goals. We believe that this approach will be more fruitful, not only for the ILF, but also for a wide range of professional, group, and learning endeavors.
Kollosche, T. (2014). The virtual leash (Thesis). University of Technology Sydney. Retrieved from https://opus.lib.uts.edu.au/bitstream/10453/24202/2/02whole.pdf	What is the relationship between the virtual leash as both a tether to cyber connections and as a constraint that binds the user to the connection? Can network technologies enhance our relationship to other cultures and identities regardless of a physical presence to increase the possibility of greater global understanding and tolerance?	Users could benefit from an expanded interaction pool that transgresses continents and borders. The nature of these interactions, provided members with an environment for discussion, the sharing of information and a space to develop group and individual identities. Aspects of what constitutes a successful community were discussed. These key parameters included the establishment of trust, the roles of participants and time spent within the community. Interviewees for this research spoke of their experiences within virtual worlds such as Second Life and how these relationships often mirrored their offline friendships. Virtual communities were shown to offer a community environment to experiment with identities and boundaries and a place to playfully test issues, in contrast with experimentation in first life that may involve great risk to the experimenter.
Krishnamurthy, B., & Wills, C. E. (2008). Characterizing privacy in online social networks. In Proceedings of the first workshop on online social networks (pp. 37–42). Seattle, WA: ACM Press. https://doi.org/10.1145/1397735.1397744	What bits of information are currently being shared, how widely, and what users can do to prevent such sharing? What is the role of third-party sites that track OSN users and compare with privacy leakage on popular traditional websites?	A mechanism to identify the metrics bare minimum and supremum would be a useful addition to the privacy arsenal. Such metrics would allow us to compare various OSNs on an equal footing and let the users decide how comfortable they are with the privacy information that is being shared.

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Lampe, C., Wash, R., Velasquez, A., & Ozkaya, E. (2010). Motivations to participate in online communities (p. 1927). ACM Press. https://doi.org/10.1145/1753326.1753616.	RQ1: How do U&G and Organizational Commitment relate to different perceptions of site use? RQ2: How do U&G and Organizational Commitment relate to the probability that a user is anonymous or registered? RQ3: For anonymous users, how do U&G and Organizational Commitment relate to the probability the user is a first-time visitor to the site? RQ4: For registered users, how do U&G and Organizational Commitment relate to their levels of participation in the site?	We find evidence that users may continue to participate in a site for different reasons than those that led them to the site. Feelings of belonging to a site are important for both anonymous and registered users across different types of uses. Long-term users felt more dissatisfied with the site than anonymous users. Social and cognitive factors seem to be more important than issues of usability in predicting contribution to the site.
Leimeister, J. M., Sidiras, P., & Krcmar, H. (2004). Success factors of virtual communities from the perspective of members and operators: an empirical study. In *37th Annual Hawaii International Conference on System Sciences, 2004. Proceedings of the* (pp. 10)..	What are the success factors essential for virtual communities?	
Lewis, K., Kaufman, J., & Christakis, N. (2008). The taste for privacy: An analysis of college student privacy settings in an online social network. *Journal of Computer-Mediated Communication, 14*(1), 79–100. https://doi.org/10.1111/j.1083-6101.2008.01432.x	What predicts privacy settings?	Corresponding to our hypotheses, we found four important predictors of privacy settings. A student is significantly more likely to have a private profile if (1) the student's friends, and especially roommates, have private profiles; (2) the student is more active on Facebook; (3) the student is female; and (4) the student generally prefers music that is relatively popular (high mean) and only music that is relatively popular (low SD). We also documented several distinct cultural preferences associated with the taste for privacy. We speculate that these tastes—which co-occur relatively infrequently with each other as well as with highly publicized tastes—are particularly undervalued in the local social context and are kept hidden for this very reason. Meanwhile, clusters of very ''public'' tastes may represent cultural profiles particularly privileged by this cohort of students.
Liccardi, I., Ounnas, A., Pau, R., Massey, E., Kinnunen, P., Lewthwaite, S., … Sarkar, C. (2007). The role of social networks in students' learning	The aim of this review is to highlight the complexity of the field of social learning and to bring forward some central aspects that need more investigation.	Many applications allow users to keep in touch with long term friends, family and to find new friends. In addition, new relationships based on the links between friends, and friends of friends are created. These new relationships are not limited to people users already know.

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experiences. In Proceedings of the working group reports on ITiCSE on innovation and technology in computer science education (Vol. 39, pp. 224–237). Dundee, Scotland: ACM.		Indeed, links are created in the act of stating an interest, or joining a network; in this action, users find other people who share the same opinions, hobbies, or university. To maintain relationships, the computer-supported social network software provides various tools within the application (forums, tickets, online profiles, etc.). Thus, users have more support options than when using one-to-one communications such as email.
Ling, K., Beenen, G., Ludford, P., Wang, X., Chang, K., Li, X., … Kraut, R. (2006). Using Social Psychology to Motivate Contributions to Online Communities. *Journal of Computer-Mediated Communication, 10*(4), 00–00. https://doi.org/10.1111/j.1083-6101.2005.tb00273.x	What contributes to under-contribution in many online communities?	As predicted by theory, individuals contributed when they were reminded of their uniqueness and when they were given specific and challenging goals. However, other predictions were disconfirmed. For example, in one experiment, participants given group goals contributed more than those given individual goals. The article ends with suggestions and challenges for mining design implications from social science theories.
Ludford, P. J., Cosley, D., Frankowski, D., & Terveen, L. (2004). Think different: increasing online community participation using uniqueness and group dissimilarity. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 631–638). Vienna, Austria: ACM Press. https://doi.org/10.1145/985692.985772	H1: People contribute more to online communities when shown personalized uniqueness information. H2: People given uniqueness information exploit this information when participating in the community. H3: People like being shown uniqueness information. We also stated two hypotheses about similarity: H4: People contribute more to online communities when they are in a discussion group with others like themselves. H5: People can identify similar people through online community interaction. H6: Users who are active MovieLens raters will be most active in the discussion groups.	H1: People contribute more to online communities when shown personalized uniqueness information.. H2: Improving the uniqueness algorithm to increase relevance would make its suggestions more useful. H3: 82% of the subjects who received uniqueness information said they benefited by receiving it. H4: In each test, dissimilar groups posted more than similar groups, and the differences were statistically significant. H5: People in similar groups rated their views similar to other members more often than people in dissimilar groups did. H6: Discussion groups attract and motivate a different type of user than recommender systems in general.
Mao, Y., Vassileva, J., & Grassmann, W. (2007). A System Dynamics Approach to Study Virtual Communities. In *40th Annual Hawaii International Conference on*	In this paper we advocate a system dynamics approach in the communities, which can provide insights into the user motivating process, incentive mechanism	Simulation models are very helpful to study the dynamics of virtual communities and useful for measurement and further improvement of incentive mechanisms in virtual communities.

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System Sciences, 2007. HICSS 2007 (pp. 178a-178a). https://doi.org/10.1109/HICSS.2007.39.	evaluation and community development.	
Matei, S. A. (2005). From counterculture to cyberculture: Virtual community discourse and the dilemma of modernity. *Journal of Computer-Mediated Communication, 10*(3). https://doi.org/10.1111/j.1083-6101.2005.tb00262.x	What are the cultural origins and social functions of the concept of "virtual community?"	The discourse about virtual community relies on a set of contradictory values: individualistic and communitarian. These values are reinforced by a belief in self-expression, self-interest, and open communication, which the founders of virtual communities inherited from their countercultural past.
Matthews, P., & Stephens, R. (2010). Sociable knowledge sharing online: philosophy, patterns and intervention. *Aslib Proceedings, 62*(6), 539–553. https://doi.org/10.1108/00012531011089667	This paper outlines a social epistemological and ethical warrant for engaging in knowledge exchange on the social web, and to emphasize socio-cognitive and emotional factors behind motivation and credibility in communities supported by social software. An attempt is made to identify positive and negative patterns of interaction from this perspective and to argue for more positive intervention on the part of the information profession.	N/A
Matthews, T., Chen, J., Whittaker, S., Pal, A., Zhu, H., Badenes, H., & Smith, B. (2014). Goals and perceived success of online enterprise communities: what is important to leaders & members? (pp. 291–300). ACM Press. https://doi.org/10.1145/2556288.2557201.	1. What are the goals of enterprise online communities according to participants? 2. Do leaders and members agree on which community goals are important? If not, how do their priorities differ? 3. Do leaders and members agree on how well their community is meeting its goals? If not, how do they differ? 4. Do communities focus on one or multiple goals? 5. Do goals differ depending on community type? Do different functional or initiative-based types of communities' value different goals? 6. How do behavioral success metrics proposed in prior work relate to participant perceptions of goal progress?	We find that most communities have multiple goals and common goals are learning, reuse of resources, collaboration, networking, influencing change, and innovation. Leaders and members agree that all these goals are important, but their perceptions of success on goals do not align with each other, or with commonly used behavioral success measures. We conclude that simple behavioral measures and leader perceptions are not good success metrics, and propose alternatives based on specific goals members and leaders judge most important.

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Matthews, T., Whittaker, S., Badenes, H., Smith, B. A., Muller, M., Ehrlich, K., … Lau, T. (2013). Community insights: helping community leaders enhance the value of enterprise online communities (p. 513). ACM Press. https://doi.org/10.1145/2470654.2470728.	Community leader needs concerned two major questions: (1) How healthy and successful is my community? (2) How can I act to enhance its health and success?	Empirical contributions include new data showing: (a) which metrics are most useful for leaders to assess community health, (b) the need for and how to design actionable metrics, (c) the need for and how to design contextualized analytics to support sensemaking about community data. These findings motivate a novel community system that provides leaders with useful, actionable and contextualized analytics.
Meng Ma, & Agarwal, R. (2007). Through a glass darkly: Information technology design, identity verification, and knowledge contribution in online communities. *Information Systems Research, 18*(1), 42–67.	Hypothesis 1 (H1). An online community member's perceived identity verification is positively related to her knowledge contribution. Hypothesis 2 (H2). An online community member's perceived identity verification is positively related to her satisfaction with the community. Hypothesis 3 (H3). An online community member's satisfaction with the community is positively related to his knowledge contribution.	Overall, the findings provide strong empirical support for the proposed relationships. The first important conclusion is that in both communities perceived identity verification from other people has important consequences about members' perceptions of satisfaction and their knowledge contribution behavior. In other words, when individuals felt that other community members verified their salient identities (personal or social, or both), they were more satisfied with their community experiences, and more likely to participate in knowledge contribution. example, the old ID was temporally banned, or the old password was forgotten). (2) Two or three IDs were used simultaneously for some reason (e.g., to obtain more community space and resources). (3) An individual wanted to change her ID to reflect her current preference or mood. (4) The old ID was stolen or became a target of spam.
Minkus, T., & Memon, N. (2014). Leveraging personalization to facilitate privacy. SSRN: https://ssrn.com/abstract=2448026 or http://dx.doi.org/10.2139/ssrn.2448026	We hypothesize that personality types correlate with Facebook privacy settings (i.e., some personality types are more likely to choose more private settings on Facebook). (1) Openness to new experiences: open individuals are artistic, curious, imaginative, insightful, original, and have wide interests. (2) Conscientiousness: conscientious people are efficient, organized, planful, reliable, responsible, and thorough. (3) Extraversion: extraverted individuals are active, assertive, energetic, enthusiastic, outgoing, and talkative. (4) Agreeableness: agreeable people are appreciative, forgiving, generous, kind, sympathetic, and trusting.	Users find the suggestions to be appropriate and private; furthermore, they express intent to implement the recommendations made by MyPrivacy.

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	(5) Neuroticism: neurotic people are anxious, self-pitying, tense, touchy, unstable, and worrying.	
Morris, P. (2011). Glimpses of Community on the Web. In Virtual Sociability: From Community to Communitas (Vol. 1, pp. 45–58). InterAcademic Press. Retrieved from https://s3.amazonaws.com/academia.edu.documents/36643684/virtual_sociability_preprintapril2011.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1525739870&Signature=1QyvgBBdqQH9vChoV0HqGj5wD%2FU%3D&response-content-disposition=inline%3B%20filename%3DVirtual_Sociability_From_Community_to_Co.pdf#page=52	To what degree can the human exchanges we observe in these spaces be called sociability? In other words, do the exchanges amount to any meaningful type of social organization? Are they more than the mere froth of collective emotion discharging its energy with a lot of noise but little consequence against the wave breakers of social media? Do the social interactions that take place in virtual space—all those kind or not-so-kind words sent back and forth—suggest the same level of commitment, dedication, morality, passion, or even depravity that we see in everyday life? Or, more succinctly, is sociability online less "social," less "real" than what we see in everyday life? Are the groups that interact online of less consequence than those that gather offline? If not, is online sociability characterized by a set of attributes that puts it on a different (perhaps superior) level of human interactivity?	N/A
Muller, M., Ehrlich, K., Matthews, T., Perer, A., Ronen, I., & Guy, I. (2012). Diversity among enterprise online communities: collaborating, teaming, and innovating through social media. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 2815–2824). Austin, TX: ACM.	RQ1: Do different types of communities differ in their Human Capital – i.e., number of people, participation rate? RQ2: Do different types of communities differ in their Intellectual Capital – i.e., what they share with each other, and which social software tools they use in that sharing? RQ3: Do different types of communities differ in their Relational Capital – i.e., the relative contribution made by people, and	We found highly significant differences through each of those conceptual lenses. Each of the three lenses provides its own distinct emphasis. The view based on Human Capital showed significantly more owners in COPs than other communities, and a trend toward more members as well. Despite the smaller number of people in Idea Labs, their intense time-constrained brainstorming process produced the highest participation rates. And yet the COPs, Teams, and Tech communities had the highest overall visit frequency. The view based on Intellectual Capital showed differential patterns of feature use, with a surprisingly high productivity of forum entries in the Tech communities. We also noted different patterns depending on whether

Attribution	Question/Problem/Purpose	Findings
	the connections they make through the tools?	we took an organizational view (emphasizing the resource available to the company) vs. a research view (emphasizing the contributions normalized for community size and age). Finally, the view based on Relational Capital showed differential accumulation of social connections among employees in different types of communities.
Raghavun, K., & Vassileva, J. (2011). Visualizing reciprocity to motivate participation in an online community. In *5th IEEE International Conference on Digital Ecosystems and Technologies (IEEE DEST 2011)* (pp. 89–94). https://doi.org/10.1109/DEST.2011.5936604.	The study aimed to validate the following hypotheses: 1) the users can interpret correctly the data represented by the visualization and 2) the visualization motivates users to participate more and be more responsive to other peoples' posts.	The results show that the visualization had a positive awareness effect, but the motivational effect on participation depended upon everyone's pre-existing attachment to the members in the community and/or to the community.
Rauniar, R., Rawski, G., Yang, J., & Johnson, B. (2014). Technology acceptance model (TAM) and social media usage: an empirical study on Facebook. *Journal of Enterprise Information Management*; *Bradford, 27*(1), 6–30. http://dx.doi.org/10.1108/JEIM-04-2012-0011	What influences adoption of Facebook using TAM?	The results demonstrate that the revised social media TAM model proposed in this study supports all the hypotheses of social media usage behavior. The results of this study provide evidence for the importance of additional key variables to TAM in considering user engagement on social media sites and other social-media-related business strategies.
Sangwan, S. (2005). Virtual Community Success: A Uses and Gratifications Perspective. In *Proceedings of the 38th Annual Hawaii International Conference on System Sciences* (pp. 193c-193c). https://doi.org/10.1109/HICSS.2005.673.	What are motivating needs that persuade users to become members in a fee-based knowledge community? Underlying question is what are the motivational factors which influence a member satisfaction in a fee-based knowledge community?	For **knowledge communitie**s, the community model should concentrate on content building. Successful **virtual community** will aim to fulfill its member's needs and engage in preemptive actions to create value for host
Scheiner, C., Haas, P., Bretschneider, U., Blohm, I., & Leimeister, J. M. (2017). Obstacles and Challenges in the Use of Gamification for Virtual Idea Communities. In S. Stieglitz, C. Lattemann, S. Robra-Bissantz, R. Zarnekow, & T. Brockmann (Eds.), *Gamification* (pp. 65–76). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-45557-	What are major obstacles and challenges in the use of gamification in VICs.	N/A

Attribution	Question/Problem/Purpose	Findings
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Schwen, T. M., & Hara, N. (2003). Community of practice: A metaphor for online design? *Information Society, 19*(3), 257–270.	This article examines four cases and identifies several issues associated with the concept of communities of practice.	Community of practice is not likely to be forced, but is emerging, and designers need to be aware of the characteristics of existing communities of practice to nurture them.
Shneiderman, B. (2000). Designing trust into online experiences. *Communications of the ACM, 43*(12), 57–59. https://doi.org/10.1145/355112.355124	What principles and guidelines enhance cooperative behaviors and win user/ customer loyalty by giving assurances, references, certifications from third parties, and guarantees of privacy and security? How to design trust into online experiences	Principle 1. Invite participation by ensuring trust. Guideline 1.1. Disclose patterns of past performance. Guideline 1.2. Provide references from past and current users. Guideline 1.3. Get certifications from third parties. Guideline 1.4. Make it easy to locate, read, and enforce policies involving privacy and security. Principle 2. Accelerate action by clarifying responsibility. Guideline 2.1. Clarify each participant's responsibilities. Guideline 2.2. Provide clear guarantees with compensation. Guideline 2.3. Support dispute resolution and mediation services.
Silva, L., Goel, L., & Mousavidin, E. (2009). Exploring the dynamics of blog communities: the case of MetaFilter. *Information Systems Journal*, *19*(1), 55–81. https://doi.org/10.1111/j.1365-2575.2008.00304.x.	What are the social dynamics that provide identity and cohesion to a prominent new type of online community: a blog community.	Our findings suggest that cohesion in a community blog is brought about by the following practices: (a) explicit ground rules regarding membership, (b) presence of moderators, (c) availability of profile information, (d) 'net etiquette', (e) tacit warrants for discerning pertinent posts, and (f) the deployment of specific techniques of discipline.
Suler, J. (2004). The Online Disinhibition Effect. *CyberPsychology & Behavior, 7*(3), 321–326. https://doi.org/10.1089/1094931041291295	Why do some people self-disclose or act out more frequently or intensely than they would in person?	Six factors interact with each other in creating this online disinhibition effect: dissociative anonymity, invisibility, a synchronicity, solipsistic introjection, dissociative imagination, and minimization of authority. Personality variables also will influence the extent of this disinhibition. Rather than thinking of disinhibition as the revealing of an underlying "true self," we can conceptualize it as a shift to a constellation within self-structure, involving clusters of affect and cognition that differ from the in-person constellation.
Tsikerdekis, M. (2013). The effects of perceived anonymity and anonymity states on conformity and groupthink in online communities: A Wikipedia study. *Journal of the American Society for Information Science & Technology, 64*(5), 1001–1015. https://doi.org/10.1002/	What are the effects of different anonymity states in relation to an individual's likelihood to conform?	Although people perceive anonymity differently depending on their anonymity state, different states of anonymity do not have a strong effect on the likelihood of conforming to group opinion.

Attribution	Question/Problem/Purpose	Findings
asi.22795		
Tsikerdekis, M. (2016). Personal communication networks and their positive effects on online collaboration and outcome quality on Wikipedia. *Journal of the Association for Information Science & Technology, 67*(4), 812–823. https://doi.org/10.1002/asi.23429	What is the structure of personal communication networks and by how much their use affects collaborative outcome quality?	This study demonstrates a link between collaborative outcome quality and the current design of Wikipedia allowing for the existence of a personal communication network. The personal communication network was found to be a valuable tool in this context by examining the user population that utilizes it, which is a subset of Wikipedia's total population and has specific characteristics relating to high quality work. The network is used by a fraction of Wikipedia's users who tend to edit high quality articles and are more integrated with the community. Although causality cannot be identified, the fact that users who make an impact are using the personal communication network is an indication of the benefits of having a personal communication network in online collaborative projects. It is a tool for coordination and perhaps even mentoring. Wikipedia's design is one of many that can exist in online collaborative projects.
Tsikerdekis, M., & Zeadally, S. (2014). Online Deception in Social Media. *Communications of the ACM*, *57*(9), 72–80. https://doi.org/10.1145/2629612.	What are the motivations and techniques used and their effect on potential targets, as well as on some of the challenges that need to be addressed to help potential targets detect on-line deception?	N/A
Vassileva, J. (2012). Motivating participation in social computing applications: a user modeling perspective. *User Modeling & User-Adapted Interaction, 22*(1/2), 177–201. https://doi.org/10.1007/s11257-011-9109-5	Is it possible to incorporate in the design of the social application incentive mechanisms and interventions that can motivate users to participate, and more generally, to change their behavior in a desirable way, which is beneficial for the community?	The design of incentive mechanisms can include personalized rewards and can adapt the rewards offered to the benefit of both the user and the entire community.
Vassileva, J., & Sun, L. (2007). Using Community Visualization to Stimulate Participation in Online Communities. *E-Service Journal*, *6*(1), 3–39.	While some Web-based online communities manage to attract users and grow enormously, others never reach the "critical mass" of active users needed to ensure enough new materials and attract users to revisit the community. Often, applications for expertise or document sharing created to serve a specific role in a certain geographic or organizational context remain unused.	The experimental results and the user feedback received through the questionnaire in the second study clearly showed that the motivational visualization effectively encouraged social comparison and competition, which resulted in increased participation. The implications for system designers are that they can encourage user participation in desired activities by showing a representation of the contributions of the community members along these activities. Care needs to be exercised in the selection of what types of participation need to be encouraged, and how they will be measured and represented, considering that if the visualization encourages social

Attribution	Question/Problem/Purpose	Findings
		comparison and competition, some users will try to game the system.
Vaughn, E. L. (2013). *Find me on Facebook: A new typology for categorizing online personalities* (Thesis). California State University, Long Beach.	Can social media users be grouped into typologies based on usage?	There are five categories of users: scrapbooker, entrepreneur, social butterfly, activist observer
Vella, K., Johnson, D., & Mitchell, J. (2016). Playing Support: Social Connectedness Amongst Male Videogame Players. In *Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts* (pp. 343–350). ACM Press.	This study asks: are online video games a space in which young men provide and receive social support, and what factors may impact on this?	Preliminary analyses suggest that games afford a means of gaining support from new connections, describes how these trusting relationships develop, and demonstrates that gameplay itself offers some emotional benefits.
Wellman, B. (2001). Physical place and cyberplace: The rise of personalized networking. *International Journal of Urban and Regional Research, 25*(2), 227–252. https://doi.org/10.1111/1468-2427.00309	1. How networks of community exist in physical places — such as neighborhoods and cyberplaces — like the Internet; 2. How the development of computer-supported community networks affects access to resources.	N/A
Xu, A., Chen, J., Matthews, T., Muller, M., & Badenes, H. (2013). Community Compare: visually comparing communities for online community leaders in the enterprise (p. 523). ACM Press. https://doi.org/10.1145/2470654.2470729.	**RQ1:** Will a metric-based visual analytic system for comparing communities satisfy community leaders' needs? How will the tool be used? **RQ2:** How should we design such a system effectively for community leaders? What design lessons can we learn?	We show how the system enabled leaders to assess community performance in the context of other comparable communities, learn about community dynamics through data exploration, and identify examples of top performing communities from which to learn.
Zhu, H., Chen, J., Matthews, T., Pal, A., Badenes, H., & Kraut, R. E. (2014). Selecting an Effective Niche: An Ecological View of the Success of Online Communities. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 301–310). New York, NY: ACM.	What is the impact of shared topics, members, content, and offline organizational affiliation?	Too little or too much overlap in topic with other communities causes a community's activity to suffer. We also show that this main result is moderated in predictable ways by whether the community shares members with, links to content in, or shares an organizational affiliation with other communities.

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