# Emerald Insight

## Article information:

## Users who downloaded this article also downloaded:

## For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

## About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

# Management of knowledge creation and sharing to create virtual knowledge-sharing communities: a tracking study

Rachel Barker

Rachel Barker is a Research Professor based at the Department of Communication Science, University of South Africa, Pretoria, South Africa

## Abstract

**Purpose** – The main aim of this paper is to address the lack of research on the potential impact of the radical changes in social networking in the so-called network society and indirectly the need to manage and constructively share in the collateral knowledge creation. To do this, a tracking study of the knowledge creation and sharing in a discussion forum has been conducted from a knowledge management perspective.

**Design/methodology/approach** – A quantitative content analysis research design has been adopted in accordance with which content, text and messages on the website were critically examined; categories and themes identified and analysed; content coded and interpreted; and the results reported, relative to the research problem and theory. Both substantive decisions (what and how to code) and technical decisions (how coding will be interpreted) were made during the coding process and the interpretation of the results (Keyton, 2015). Three levels of division were used in the development of the coding system, namely, message construction, a summary of criteria and subcriteria and main links and sublinks (Wagner et al., 2012). The unit of analysis was a website, specifically the SouthAfrica.com online discussion forum, which presented an observable and measurable unit for the dissection of the text into components, criteria, subcriteria and elements to be analysed.

**Findings** – Two main findings emerged. First, it was empirically found that knowledge intervention by an expert in the organisation is in fact possible (and indeed needed as a proactive means) to ensure new knowledge is created and shared by individuals in the forum on a continuous basis. Second, it was found that a good theoretical foundation or framework can indicate the importance of various aspects which should be considered to obtain useful results from the participants or members of the forum through knowledge management.

**Research limitations/implications** – The study is limited by the fact that it only focussed on the measurement of knowledge management in one online discussion forum, SouthAfrica.com, during two time frames from an organisational perspective in terms of the three Cs. Further research in other settings would enhance the findings of this study, and researchers are encouraged to use the theoretical framework in future studies.

**Practical implications** – The main implication for managers in practice is that the research proved that participants in an online discussion forum quite often regard those members who manage the discussion forum as "experts", but organisations then run the risk that the knowledge created and shared might not support, and/or might be detrimental to, the overall objectives and brand of the organisation.

**Originality/value** – This paper proposes the use of a theoretical framework to measure knowledge management, as applied to the identified online discussion forum, focussing on the three main components of content, communication and consumer with subcriteria and elements of the knowledge management perspective specifically. The main findings indicated that knowledge creation and sharing in online discussion forums is best supported if these components are proactively managed by an expert in the organisation to sustain and enhance successful communication.

**Keywords** Knowledge management, Virtual communities, Knowledge creation and sharing, Online discussion forums

**Paper type** Research paper

"**The findings of the comparative analysis indicate that many ways exist to determine whether the management of knowledge creation and sharing through intervention by an expert is purposeful.**"

## 1. Introduction

According to Bernier and Bowen (2004: 120), text-based online discussion forums bring about a "virtual sociability" *as a pragmatic dimension producing real-time applied knowledge [. . .] inherent in* "democratic network lives", while according to Arling and Chun (2011, p. 231) *few organizations truly understand how to manage knowledge to achieve their goals*. This was also spurred through the rapid evolvement of the "science of networks" (Watts, 2007) and the popularity of online communication. Online discussion forums (also referred to as web forums, Internet forums, message boards, discussion boards, bulletin boards or forums) are web applications for discussions and the posting of user-generated content (Barker, 2008) and afford one example of an online social network or virtual community. An online social network is defined as a set of personal relationships in cyberspace where computer-mediated space integrates/facilitates knowledge creation and sharing and is characterised by groups of people with more or less specific, complex and common goals, value systems, norms, rules and a sense of identity which they want to enhance through electronic communication (Barker, 2006, p. 132). These forums can address an entire online social community or a specific topic, and the messages are usually displayed either in chronological order or as threaded discussions or as a combination of both.

Various authors realise the importance of managing the effects of knowledge creation and sharing in these forums, emphasising that organisations need to manage these information knowledge settings constructively through interactive participatory communication, innovative solutions and control in cyberspace. Styhre (2003, p. 15) distinguishes between different theoretical perspectives to define the notion of organisations on the basis of knowledge-based resources or assets: the *transaction costs theorists*, who see the organisation as an equilibrium of minimised transaction costs; the *agency theorists*, who conceptualise the organisation as a package of contracts, tangible, as well as psychological or emotional; and *knowledge management theorists*, who see the organisation as a collective of intellectual resources, implicating knowledge creation and sharing in various forms. The latter approach is specifically relevant in the context of this paper, based on the argument that successful organisations are characterised by the constant proactive creation of new knowledge and the fast dissemination and representation thereof through a commitment to and understanding of individuals in the organisation.

## 2. Literature review/theoretical framework

### 2.1 Approaches to online social networks

Various researchers have proposed different models to investigate online social networks from, inter alia, a social, relational, learning, information exchange, knowledge management, information networks and members' needs perspective, depending on the discipline from which it is studied. Although specific models or frameworks have been developed to address specific research outcomes, a literature review indicates that the theoretical underpinnings of existing research in this field can broadly be categorised in terms of three main approaches, namely, representationalist, constructionist and

consumerist (Kimble and Hildreth, 2005, p. 102; Streatfield and Wilson, 1999; Hersberger *et al.*, 2007, p. 136; Nonaka, 1991). Theorists following a *representationalist* approach focus mainly on measuring the usefulness and perceived ease of use of virtual communities. Because of the focus on technology, the most common model used to measure virtual communities in terms of this approach relies on the technology acceptance model. In the *constructionist* approach, theorists focus on the communication of knowledge in virtual communities using theoretical perspectives such as Streatfield and Wilson's (1999) "deconstruction" of knowledge management approach; Nonaka's argument that tacit knowledge can be converted into explicit knowledge; the duality approach of Hildreth and Kimble (2002), which argues that knowledge has both harder aspects (where knowledge can be made explicit) and softer aspects (where knowledge is less structured and difficult or impossible to articulate, and therefore tacit, which requires active interaction); and the community embodiment model, which draws on cultural notions of "imagined community" and proposes that interactions within virtual communities are a linking of the physical and the virtual, personified by the imagined. Theorists using the *consumerist* approach focus mainly on obtaining insights into the consumer. Much research has been conducted in this regard, focussing on different consumer aspects, with the most recent approach being the four-tier pyramid conceptual framework proposed by Hersberger *et al.* (2007, p. 136), which emphasises the information-sharing behaviours that are critical for building those human relationships necessary for the development of online social networks.

### 2.2 Knowledge management

The theoretical basis chosen for this article is the knowledge management approach, which can be considered as an emerging theoretical approach linked to other theoretical traditions in social sciences. While this article does not provide an in-depth review of this theory, it does contribute to the proposed theoretical framework by giving a brief overview of pertinent considerations in managing knowledge creation and sharing in online discussion forums. Knowledge creation and sharing is defined as the generation, storing, representation and sharing of knowledge to the benefit of the organisation and its individuals to ensure comprehensive and understandable management initiatives and procedures in the organisation (Bell, 2001, p. 49). In terms of theoretical constructs, knowledge management includes three main components: interactive, technological and human. In considering the communication problems, Shannon and Weaver (1949) identified that, based on their mathematical model of communication, the application of these components to electronic communication could be particularly valuable, as they have already been well established within the communication field. The three problems they identified were: technical problems (How accurately can the symbols of communication be transmitted?); semantic problems (How do the transmitted symbols convey meaning?); and effectiveness problems (How effectively does the received meaning affect human behaviour?). Ardichvili *et al.* (2003, p. 64) go on to re-emphasise the human component of knowledge management, arguing that one of the crucial aspects to determine a virtual community's success is motivated by actively participating members of an organisation in these activities – thereby creating virtual knowledge-sharing communities. Earlier knowledge management studies focussed mainly on the capture and dissemination of knowledge. In the mid-1990s, the focus shifted towards the community of practice (CoP) ideas, which saw the emergence in 1997 of the first CoP (or communities of knowledge sharing) (Ardichvili *et al.*, 2003, p. 66), referred to in the virtual world as VcoPs.

**"Rapid and proactive responses to postings on an online discussion forum are crucial."**

Although most traditional approaches to knowledge management assumed this knowledge to be relatively simple, more recent approaches realise that knowledge is in fact complex, factual, conceptual and procedural. A tendency still exists to follow the tradition in thinking of communication as the transfer and processing of information, but currently a move towards a focus on knowledge creation and sharing is evident. One of the key discourses of the knowledge management paradigm is hence the focus on explicit and implicit, embodied, tacit and narrative knowledge and the "absent presence" of the body (Nonaka and Takeuchi, 1995) as an essential part of everyday communication because it allows for the creation and sharing of knowledge.

### 2.3 Theoretical framework for the research

Drawing from the above, Barker (2008) proposed a theoretical framework to evaluate knowledge management in virtual communities, based on the following three main components and subcriteria (also referred to as the three Cs): content (technology), communication (interactive knowledge creation and sharing) and consumer (human). This theoretical framework is based on the categorisation of a viable theoretical synthesis which, according to Killick and Taylor (2009), should have been successfully used in previous work of a similar nature and scope. In this case, the literature was derived from diverse fields of knowledge through a consistent frame of reference and terminology across both studies. The thematic analysis allowed for a deductive approach for the organisation and identification of key themes and issues based on three multi-dimensional levels, namely, the micro level (individual interactions and processes), the macro level (structures) and the meso level (group behaviours and processes). If applied to the online discussion forum, it is argued that social organisational networks and systems involve interaction among a collective of individuals who may influence or alter the behaviour of others. The basic structure of the theoretical framework is presented in Figure 1.

Central to this framework is the participation of all members of the online community in the creation and sharing of knowledge through their brand/service experience, which is ultimately derived from the interrelationship between the three Cs: content, which is enabled through technical infrastructure; communication, which allows for knowledge creation and sharing; and the consumer, which is needs-driven, derived from active participation and interaction to build trust/commitment, thereby creating or enhancing online relationships.

**Figure 1** Theoretical framework to evaluate knowledge management in virtual communities
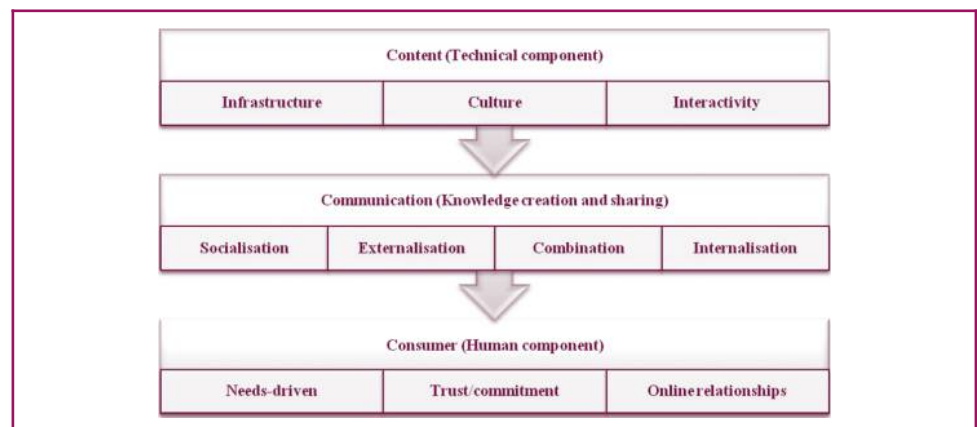
*2.4 Subcriteria and elements of the theoretical framework*

The subcriteria and elements of the three criteria (content, communication and consumer) are presented in Table I.

| Table I | Theoretical perspectives on cyber identity | |
|---|---|---|
| *Perspective* | *Theory* | *Main thrust(s)* |
| Social | Social constructionism | Meaning based on interpretation of knowledge through interaction |
| | Constructivism | Interpretation reality through social constructs |
| | Social categorisation theory | Extent to which individuals categorise and associate themselves in a specific group to enhance their social identity |
| | Symbolic interactionism | The way in which individuals form meaning and structure associated with symbols exchanged through communication and interaction |
| Social psychology | Social identity theory | Categorisation process influenced by *behaviour* and directly linked to self-esteem and self-pride |
| | | Positive "identity" created by showing cohesion with in-groups and bias against out-groups |
| | Identity theory | Individuals have multiple identities determined by roles and norms |
| | | The self is seen as being reflexive which leads to the objectification of identity which is then categorised in relation to other social categories or groups |
| Communi-cation/Identity | Knowledge management | Focus on explicit and implicit, embodied, tacit and narrative knowledge, and the "absent presence" of the body |
| | Communication theory of identity | Integrating community, communication, social relationships and self-concepts into the formation of identity symbiotic |
| | | Relationship between identity and communication |
| | Theory of communication and identity | Connects an individual's communicative choices with their personal narratives, their personal narratives with their bodily experience of emotionality and mood, and each of the former with the environmental resources available for the creation and sustenance of particular identities |
| | | Communication, personal narrative and mood all work together to form and construct an individual's identity and assists in the management of uncertainty within interactions |
| | | Identity is dynamic and in a continuous state of flux; changing based on situational contexts and the notion of a "surround force" |
| | Identity management theory | Role of identity in relationship management |
| | | Cultural communication |
| Psychological | Self-discrepancy theory | 11.1 A discrepancy exists between a persons' "usual self" and their "ideal self" who signifies a specific type of negative psychological situation and generates feelings of frustration and disappointment (psychological distress) |
| | | 11.2 Relates to the idea of minimizing frustration of maximizing satisfaction between a person's current view of self ("usual self") and their possible future self and hoped for self ("ideal self") |
| | | 11.3 Focus on specific aspects of a person's identity such as ethical/racial, sexuality/gender, vocational/organizational and athletic/health |
| | | 11.4 Needs an ideographic approach to capture changes in personal identity through self-categorization and repertory methods and ideographic explorations |

"**Knowledge intervention by an expert in the organisation is possible to ensure that new knowledge is created and shared by individuals in the forum on a continuous basis.**"

The dimensions summarised in Table I are closely related to each other. Overlaps may exist and they might differ from organisation to organisation. It is, for example, difficult to separate content from the communication that takes place and the consumer that participates in this process. An alignment of the different criteria, subcriteria and elements is therefore needed to ensure the effective management of knowledge in this process.

## 3. Research methodology/data analysis

### 3.1 Research problem

The main research problem is to address the lack of research on the management of knowledge creation and sharing in virtual communities, specifically in an online discussion forum. The main objective is to compare the initial findings of a study conducted in 2009 to indicate how the implementation of suggestions impacted on the management of knowledge creation and sharing in an online discussion forum with those of a follow-up study in 2012 involving the same online discussion forum. To do this, the paper distinguishes between the key concepts and particularly addresses the theoretical typology of content, communication and consumer in the technical, information creation and sharing and human dimensions of knowledge management through a tracking study of the same online discussion forum during two specified time frames to identify trends and make recommendations on how to address the issue.

### 3.2 Sample/research procedure

The unit of analysis was a website, which presented an observable and measurable unit for the dissection of the text into components, criteria, subcriteria and elements to be analysed. Important to note is that only the main "threads" or "first initiations" in the different forums, forum categories and forum subcategories were documented, and that not all the posts on a specific thread (which, in some cases, amounted to thousands) were included. The threads or first initiations included a combination of statements and questions which can be broadly categorised as follows: individual views or statements, statements to stimulate debate and obtain feedback from other participants, questions to ask opinions, questions to obtain information and statements on asking for help or advice on specific issues.

A non-probability sampling method, namely, convenience sampling, was used because the online discussion forum, namely, the SouthAfrica.com discussion forum, being an open forum for all, was conveniently available and easily accessible (Wagner et al., 2012; Keyton, 2015). Important aspects listed by various researchers like Maclaran and Catterall (2002), Taylor (1999), Ward (1999) and Soukup (1999) when collecting data in the virtual world was considered in this research, including that online research presents the researcher with idiosyncratic theoretical and methodological subject matters; identities are created, developed and discarded; participants have at least two bodies, real and digital, and may indeed have a number of multiple identities or personae within a single community or across multiple communities; characteristics of participants are "unknown" beyond demographics such as age, gender, etc.; membership of virtual communities changes continually, demanding an "opportunistic" approach to data collection; virtual research means rethinking certain methodological limitations, such as a lack of certain paralinguistic markers, less interviewer control (which can also be seen positively in both epistemological

and methodological terms through the promotion of equal balance of power between researcher and participants) and, because of its asynchronous nature, less spontaneity in participants' responses (which will lead to more thoughtful, structured and edited responses, which might be more enviable as it allows for greater openness and revelation); online research is more than merely doing fieldwork and writing up the findings – the virtual "field" is always present for the online researcher, which allows the researcher to continue to participate in virtual communities (VCs) during the final stages of the research to verify his or her interpretation, and even permits collaborative interpretation, which can prevent objectification and ethical issues; and the anonymity of participants, greater "control" over the situation and possibilities for equitable relationships between researcher and participants means that the virtual community "speaks for itself".

### 3.3 Data collection and measurement

Methods used to measure the use of online social networks as virtual communities, linked to the theoretical underpinning, can broadly be categorised into three categories:

1.  methods to measure website usability and technological issues;

2.  methods to measure the behaviour of consumers or consumer-orientated methods; and

3.  methods to measure the communication in virtual communities.

This research adopted a combination of all three methods in a theoretical framework, using pre-defined inclusion criteria for the evaluation of an interactive website (Best et al., 2014), specifically the SouthAfrica.com online discussion forum. A quantitative content analysis research design has been adopted in which content, text and messages were critically examined, categories and themes were identified and analysed, content was coded and interpreted and the results were reported relative to the research problem and theory. Both substantive decisions (what and how to code) and technical decisions (how coding will be interpreted) were made during the coding process and interpretation of the results (Keyton, 2015). Three levels of division were used in the development of the coding system, namely, message construction, a summary of criteria and subcriteria and main links and sublinks (Wagner et al., 2012).

The use of the online discussion forum by different users or community members was monitored over the following two time frames: time frame 1 (TF 1), September 2009; and time frame 2 (TF 2), September 2012. The total number of registered users was counted which resulted to 28,803 during TF 1 and increased to 40,803 during TF 2.The three main criteria, subcriteria and elements in Table I were used as the three constructs of the theoretical framework to evaluate and measure the descriptions in the online discussion forum. This was quantified by using a combination of the following: counting of the number of links, monitoring the content and messages, observations through lurking in the background, counting the number of replies from "experts" and/or registered users, monitoring the feedback and use of the discussion forum, levels of involvement, etc. For example, the element navigation, speed and reliability of the first criterion (content) and the subcriterion infrastructure were measured by counting the number of links, monitoring the speed and looking at the reliability of the technical layout to enter and use the discussion forum. Another example is the element involvement of the participants that was measured in terms of the number of participations in the discussion forum as well as the level of involvement. Similarly, the element shared artefacts, language, rituals and traditions was measured through the concept of "lurking", where the researcher was a non-participative observer trying to understand the meaning transferred out to the community to get an understanding of how the organisation tries to shape the community's history, culture and consciousness. According to Evans et al. (2001, p. 154), the concept of lurking connotes a way to learn the rules or norms of the community from the background to understand the

language and subject matter before making a contribution and is more than merely netiquette or standards of conduct in virtual worlds.

### 3.4 Reliability and viability

Reliability has been ensured through the consistency of the measurement, where constructs were measured and coded the same way each time under the same conditions at the same website (Wagner *et al.*, 2012). Content validity was ensured through the comparison of the same items in the measurement tool (the theoretical framework developed from the literature review of the construct) with the relevant content domain for the constructs measured (Trochim, 2006).

## 4. Results

The results of the comparative analysis of the data obtained through the tracking study during the two specific time frames are subsequently discussed in terms of the following: the main criteria, the subcriteria and elements and the main threads and first posts.

### 4.1 Results on the main criteria during both time frames

The criteria, subcriteria and elements listed in the theoretical framework were tabulated and weighted. Each of the three Cs was allocated an equal weighting of 33.3 per cent and the subcriteria were weighted in terms of importance. For example, the criterion *content* was allocated a weighting of 33.3 per cent, the subcriterion *infrastructure* a weighting of 11, *culture* 11 and *interactivity* 11 1/3. The elements of each of these subcriteria were allocated an equal weighting, and the total amounted to the weights assigned to each of the subcriteria. The overall results of the measurement of the SouthAfrica.com discussion forum in terms of the main criteria (three Cs) of the proposed theoretical framework used during TF 1 and TF 2 are indicated in Figure 2.

Figure 2 shows that during TF 1, the SouthAfrica.com discussion forum chat room scored the highest in terms of the criterion *consumer* (27.2 per cent), mainly because of the high scores in terms of the elements *community feelings*, *social bonding* and *online relationship bonds* formed between the regular users of the online chat room. Although, during TF 2, this criterion scored the lowest (28.7 per cent), it was still higher than that in TF 1, mainly

**Figure 2** The results of the evaluation of the SouthAfrica.com discussion forum during TF 1 and TF 2 in terms of the main criteria (three Cs)
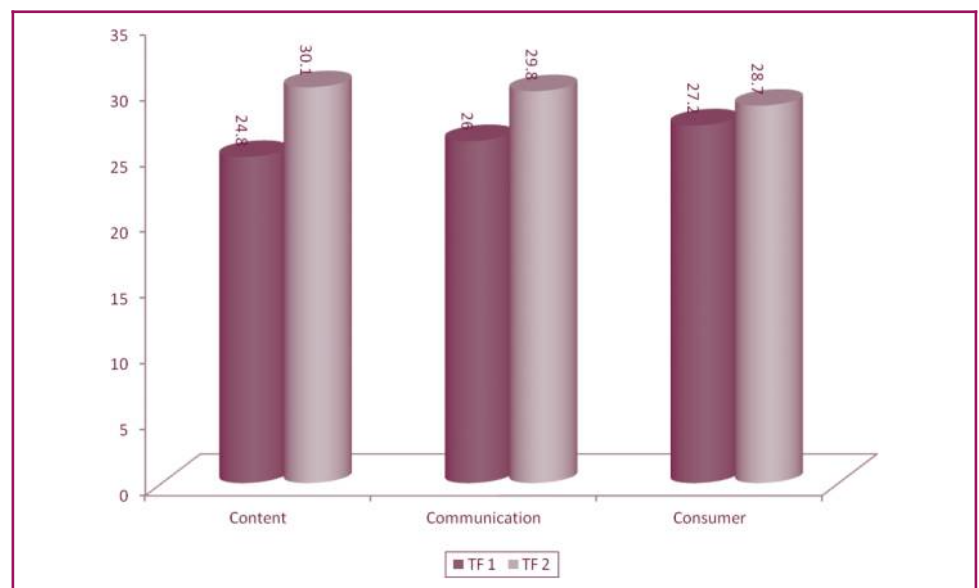
because of the fact that it was much more *needs-driven* (especially in terms of the elements *interest*, *fantasies*, *feedback* and *online relationships*, which proved to be very high) and the *trust/commitment* (through loyalty and strengthened community feelings) which was formed between the members, which was also evident in the higher *involvement of participants* through a high number of posts on each thread and the fact that much more information was exchanged between the members.

The criterion *communication* scored second highest during both time frames, namely, 26 per cent during TF 1 and 29.8 per cent during TF 2. During TF 1 intervention or knowledge management by people who identified themselves as *experts with know-how* (and in most cases provided substantiated data/feedback) was evident, while during TF 2, much more *knowledge was generated* through shared experiences to make tacit knowledge more explicit through dialogue, and *was used* by members and also, for data mining purposes, by the 'experts'.

During TF 1, the criterion *content* (24.8 per cent) scored the lowest, but still fairly well, in terms of *interactivity* between members; the *ease of use* of the infrastructure and *accessibility* to the online chat room; as well as the *capturing and storing* of information, with a number of quotes being used and the data being stored and constantly referred to for the past five years. In contrast, during TF 2, the criterion *content* scored the highest (30.1 per cent), mainly because of the improvements made to the infrastructure (especially in terms of the elements *navigation*, *speed*, *accessibility* and *capturing and storing of information*); the culture created through elements such as *shared artefacts*, *language*, *rituals* and *traditions* (which addressed the different cultures in South Africa to a much higher extent than during the previous time frame); and the increased posts, which are an indication of the *interactivity* (through a better *designed interface*) of the online discussion forum.

### 4.2 Results on the subcriteria of the three main criteria during both time frames

The main findings in terms of the subcriteria of the three Cs, *content*, *communication* and *consumer*, are indicated in Figures 3-5. Although the elements are not specified in the figures, the total results of each are reflected in the overall results of the subcriteria. In other words, the results ascribed to each element were used in the calculation of the total results of the subcategories and are indicated in the discussions after each figure.

**Figure 3** The results of the subcriteria of the first main criterion, *content*, of the SouthAfrica.com discussion forum
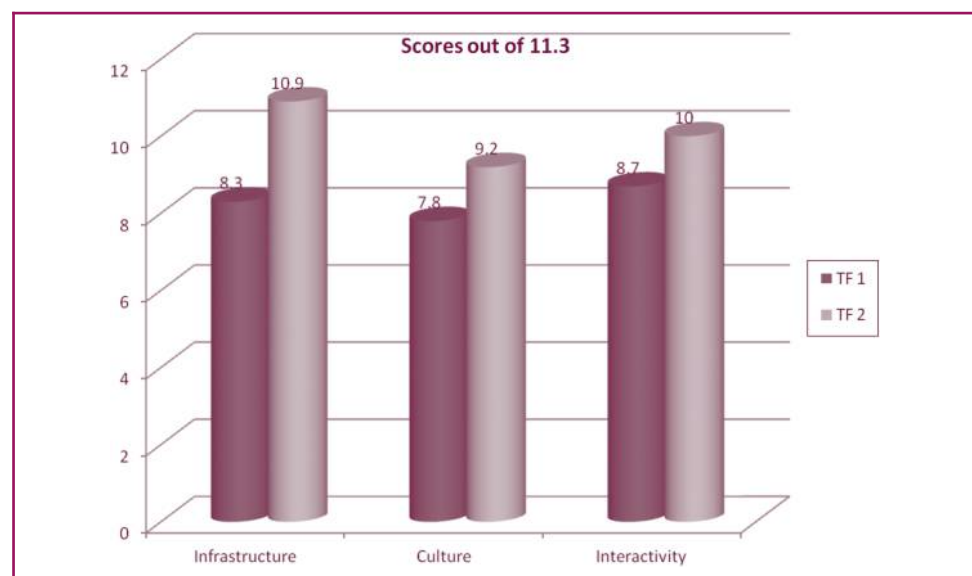
**Figure 4** The results of the subcriteria of the second C, *communication*, of the SouthAfrica.com discussion forum
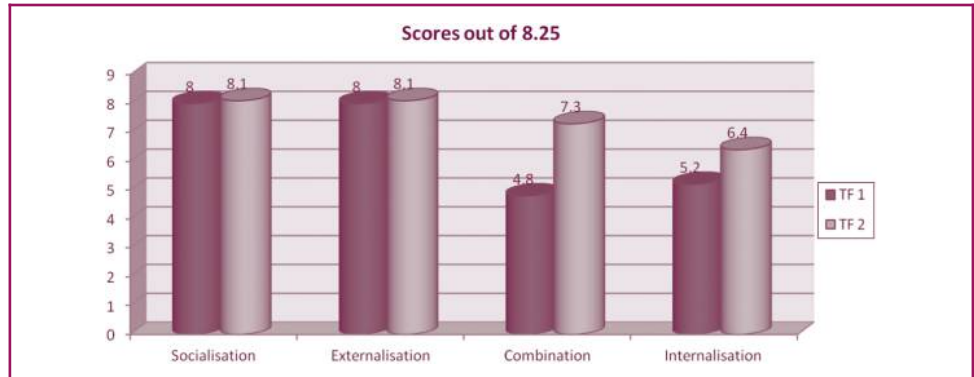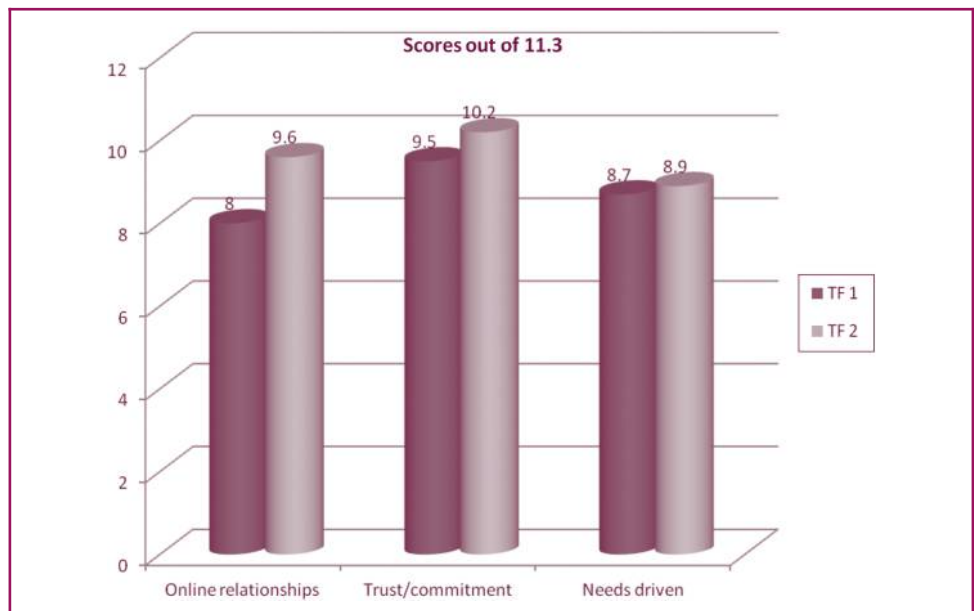


**Figure 5** The results of the subcriteria of the third C, *consumer*, of the SouthAfrica.com discussion forum



*4.2.1 Content.* Content was measured in terms of three subcriteria, namely, infrastructure, culture and interactivity, which were given equal weightings and added up to a third of the overall percentage (where each C equalled a third). The results of these subcriteria are presented in Figure 3.

From the results indicated in Figure 3, it was clear that although during TF 1 the infrastructure was very good in terms of *navigation*, *speed*, *reliability* and *accessibility* and scored high in this section, very few *aesthetics* had been included which might have hampered the first impression of the forum. An interesting fact noted was that all threads were rated 5/5 (Excellent), which might be either a standard setting or coincidental – it is equivocal whether they could all score the same. An area for improvement during TF 1 was the *capturing and storing* of information through the centralised customisation of information, which resulted in a lower score. Furthermore, a *consciousness of kind* was not evident because there was no strong feeling binding the members together. The lowest score was given to culture, mainly because the representativeness of all cultural groups was not clear, especially as far as *shared artefacts*, *language*, *rituals* and *traditions* were

concerned, but high *moral* commitment and strong group cohesion were apparent. Two areas of concern were the *customer focus* and *reliability* of the information communicated. Although there was good interaction, reaction and interventions by members who referred to themselves as "experts" in most cases, some speculations and unfounded data were presented in certain threads by members themselves. No clear "management" from the discussion forum itself was evident to validate the interface, except in the case of three messages where the community members were referred to relevant sites or sources. This indicated a general lack of knowledge management from the organisation's side and that the information communicated was not organisational or knowledge-management driven, but more focussed on individual or group communication between members. The *personal relationships* of the groups were extremely high, which contributed to the high score allocated to interactivity between members, followed by the elements of *ease of use*, *participation* and *designed interface*.

During TF 2, the scores were much higher than those during TF 1. For example, the subcriterion *infrastructure* received a high number mainly because the *aesthetics* were more visible through improved design in the technology, better *navigation and reliability* were created through links and the credibility of information underscored by experts, *accessibility* improved through user interfaces and the *capturing and storing* of information about the users made data mining possible because of centralised customisation. The second highest score for this criterion was in terms of *interactivity*, which links to the *ease and speed of use* of information and the involvement of members in the online discussion forum. During TF 2, the criterion *culture* scored much higher than in TF 1, mainly because the topics and threads were much more representative of all cultural groups and customer focussed, especially as far as *shared artefacts*, *language*, *rituals* and *traditions* were concerned, and a very high *moral* commitment and strong group cohesion were still apparent because the system allowed for *personal relationship-building* between members of the group.

*4.2.2 Communication.* The criterion *communication* was evaluated in terms of the following subcriteria with their relevant elements: socialisation, externalisation, combination and internalisation. The results are presented in Figure 4.

From the results in Figure 4, it is clear that during both TF 1 and TF 2, the subcriteria *socialisation* and *externalisation* scored very high, mainly because real sharing of knowledge took place through the *generation* of members' own interpretations of the tacit knowledge, and the *development* of knowledge which was done through members who identified themselves as "experts" in the field and provided substantiated data supported with evidence, allowing for the sharing of *innovative communication* of knowledge. During TF 1, it was unclear whether explicit knowledge was *transferred* to the members, resulting in the lowest score for this subcriterion. During TF 2, the subcriterion *combination* scored much higher than during TF 1, mainly because of the integration and categorisation of knowledge through the introduction of a systemising process and data mining, which allowed the *transfer* of knowledge to create value. The last subcriterion, internalisation, scored second lowest during both time frames, but indicated that the information provided (whether correct or incorrect) was *used* by the members to a large extent, which indicated that the explicit knowledge was made tacit.

*4.2.3 Consumer.* Figure 5 presents the results of the measurement of the third C, *consumer*, in terms of the following subcriteria: needs-driven, trust/commitment and online relationships. It is important to note that some of the elements of the subcriteria have not been used because they did not apply to the SouthAfrica.com discussion forum measured. These elements include aspects such as transaction, shared interface, emotional values and consumer satisfaction (because the main focus was on C2C communication).

As indicated in Figure 5, the highest score was allocated to the subcriterion trust/commitment during both time frames, mainly because of the *social bonding* that developed between the members as a result of the interactive and repetitive nature of

exchange in these relationships. During TF 1, all members participated in the discussion forum anonymously through the use of "nicknames" or "pseudo names" such as "Woestynryer" (the member who initiated the most discussions on a wide range of threads), "Assassin", "Scooby", "Theja", "Adonis", "Joovilhar", "Ches", "Liza81" and "Benjyboy", to name a few of the most frequent users of the discussion forum. During TF 2, only a few members used pseudo names (such as "Pommie", "Foambather", "Gift833", "mikkimouse" and "Abteka"), while most members used "real" names (including "ThomasGrove", "Mfundo Nkosi", "Caleb Dun" and "Leigh Larkin", to name a few), which made the bonds during TF 2 stronger and *strengthened community feelings* between some of the members who communicated interactively on a regular basis. The subcriterion with the second-highest score during TF 1, *needs-driven*, was ascribed to good *feedback* given to encourage knowledge sharing and to reinforce active learning through reference to substantiated data and references and links to other relevant sites. While a slightly higher score was allocated in TF 2 in terms of this subcriterion, it scored the lowest of the three mainly because no real difference was observable during TF 2 other than the fact that a slight increase in *feedback* was notable from "experts" on specific topics, which encouraged knowledge sharing and reinforced active learning. While the subcriterion *online relationships* scored the lowest during TF 1, it scored second highest during TF 2, mainly because a strong *involvement* of the participants was prevalent, which enhanced the *relationship bonds* between the members of the community that communicated on a regular basis. During TF 2, the use of "real" names also increased *personalisation* (the members started to know each other), which led to a higher level of trust and commitment between the members so that they participated more freely in the SouthAfrica.com discussion forum.

### 4.3 Results on the main threads and first posts during TF 1 and TF 2

During TF 1, the online discussion forum monitored experienced 115 first posts on a specific thread, ordered chronologically according to date, not topics. The researcher categorised the posts and threads in terms of ten broad categories in no specific order of importance, namely:

1.  *politics* (including parliamentary issues, Nelson Mandela, Zuma, etc);

2.  *culture* (like black people and Africanisation);

3.  *geoFigureics* (like data on areas, cities, etc);

4.  *nature* (such as snakes, leopards in the Kruger National Park, shark attacks, freak storms and blazes);

5.  *history* (early South Africa, apartheid mass graves, and San people);

6.  *crime* (considered in terms of serious crimes like murder, rape, mobbing, etc. versus minor crimes like hacking and speeding);

7.  *products/services* (including threats on helplines, various product and service complaints, festivals, etc.);

8.  *community involvement* (like school projects, aids awareness, etc.);

9.  *entertainment* (events, clubs, choirs, beauty pageants, etc.); and

10. *international issues* (including news and events in Africa, Zimbabwe, China, Malawi, India, Afghanistan, Israel, world debates and the USA, etc.) (Barker, 2008).

During TF 2, the information was already ordered according to forums (on specific topics), which was the complete opposite of TF 1, when the information was ordered chronologically according to dates. Another important difference is that during TF 2, the forum was subdivided into different sub-forums. Another interesting observation was that during TF 2, it was found that the recommendations made by the researcher after the monitoring of the online discussion forum during TF 1 had been incorporated, particularly

the use of topics, sub-topics and postings. The site and postings were not ordered chronologically, but had ten broad categories (which they referred to as "forums") with subcategories in the following order:

- *guest book* (including the subcategories of messages from visitors on what they have to say and brief greetings);

- *open board* (including subcategories such as the sharing of photo albums, buy-and-sell advertisements, jokes or cartoons and searching for any topic);

- *society* (which interestingly enough is one of the proposed categories indicated for TF 1 under the category "politics", namely, South African politics, business in or with South Africa and current events in South Africa);

- *culture* (which corresponds with one of the categories during TF 1 and includes a number of overla5s with the other categories in TF 1, with the following subcategories: cuisine, history, language, literature and film, music and art, religion, school projects and sport);

- *personals* (including the subcategories personal questions and friendship networks, pen pals, genealogy and searching for people);

- *gay and lesbian community* (where the subcategories include specifically stories worldwide and the gay dating network) and *human rights* (specifically categories on stories about human rights issues in the South African context and internationally in terms of victims of the UNHCR);

- *travel and tourism* (including the subcategories travel tips in and around South Africa, immigration information and moving/furniture);

- *suggestions* (with subcategories like feedback to administrators and moderators, which can be seen as a proactive knowledge management step) and *archives* (which provides a link to two subcategories, namely *mark forums read* and *view forum leaders*); and

- *what's going on?* (with subcategories providing information on currently active users and statistics on the 7,246 threads and the 31,080 posts of active members, which can be seen as the proactive use of information and database management).

The percentages allocated to each of the threads, which were ordered and 'termed' by the researcher in terms of subcategories during TF 1, are indicated in Figure 6.

The calculations in Figure 6 were made in terms of the ten main subcategories or initiations as categorised above for TF 1. In terms of this, most initiations derived from *international news* (30 per cent) (with a large number of threats on issues in Zimbabwe and Mugabe, followed by news in the USA, Europe and Africa), followed by *crime*

**Figure 6** Main threads of the SouthAfrica.com discussion forum during TF 1
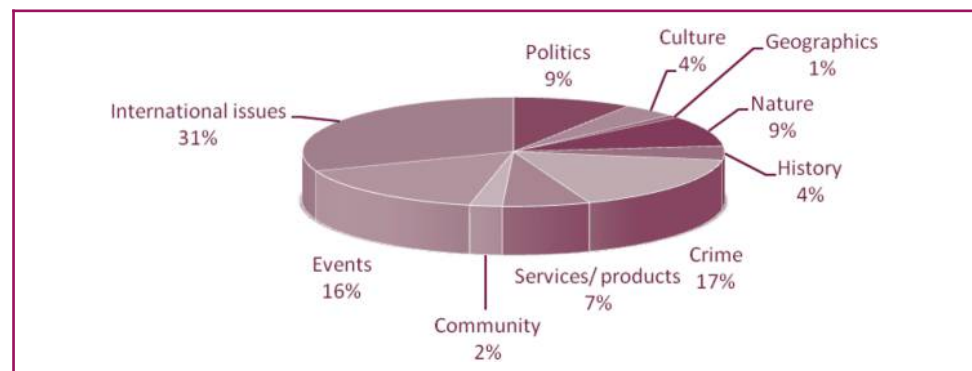
(17 per cent) (which was a major concern in the South African context), *events* (16 per cent), etc. Figure 7 presents the results of the main threads of the SouthAfrica.com discussion forum during TF 2.

The calculations in Figure 7 were made in terms of the ten main forums or subcategories as categorised on the forum itself for TF 2. In terms of the results, most of the threads were on the *open board* (22 per cent with 1,742 threads and 7,186 posts), followed equally by *personals* (21 per cent with 1,617 threads and 2,466 posts) and *culture* (21 per cent with 1,615 threads and 7,360 posts). Although the latter two scored equally in terms of number of threads, it is clear that the posts on *culture* were almost 30 per cent higher than in the *personals* thread, with the most posts in the subcategory *religion* (3716 postings). Interestingly, during TF 1, the subcategory *culture* as a thread scored only 4 per cent, compared to a score of 21 per cent during TF 2. Another interesting observation is that the lowest percentages went to *human rights* (1 per cent with 60 threads and 432 posts) and *gay and lesbian community* (1 per cent with 69 threads and only 219 posts) despite the fact that these are currently dominant and much debated topics, with activists in these South African communities taking an active role.

## 5. Conclusions

Based on the main objective of this article to address the lack of research on the management of knowledge creation and sharing in virtual communities, specifically in an online discussion forum, the findings of the comparative analysis indicate that many ways exist to determine whether the management of knowledge creation and sharing through intervention by an expert is purposeful. Specifically, the three main components of the knowledge management approach were utilised, with a particular focus on the interrelationship between the three Cs: content, which was mainly enabled through technical infrastructure; communication, which allowed for knowledge creation and sharing; and the consumer, which was needs-driven, deriving from active participation and interaction to build trust/commitment and thereby creating or enhancing online relationships. The use of these components with their relevant subcategories and elements demonstrated that rapid and proactive responses to postings on an online discussion forum are crucial. Based on the results, two main findings are evident:

1. knowledge intervention by an expert in the organisation is possible (and indeed needed as a proactive means) to ensure that new knowledge is created and shared by individuals in the forum on a continuous basis; and

2. a good theoretical foundation or framework can illustrate the importance of various aspects which should be considered to obtain useful results from the participants or members of the forum through knowledge management.

**Figure 7** Main threads of the SouthAfrica.com discussion forum during TF 2
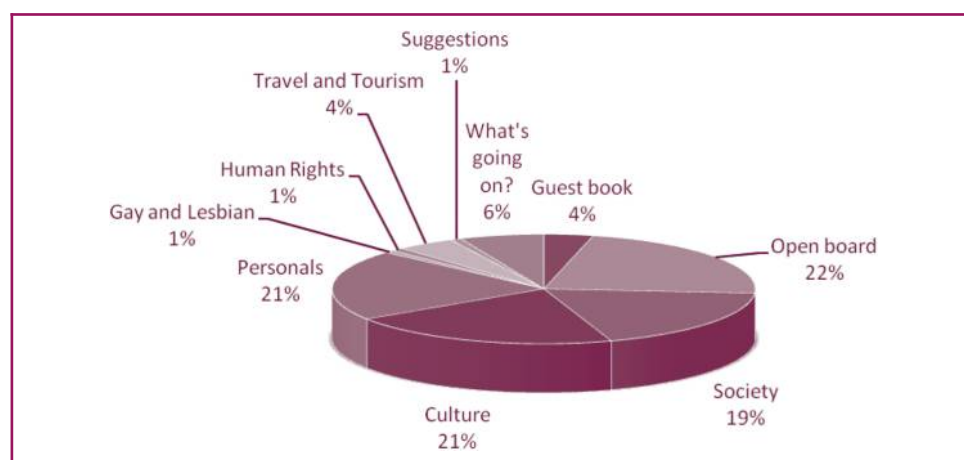
From the findings it is clear that the emphasis in the content component on improved infrastructures to ensure accessibility, navigation, speed and the capturing and storing of information is necessary to create a culture in which individuals feel they are committed based on reliability and the interactivity that takes place. Furthermore, the subcriteria of the communication component, namely, socialisation, externalisation, combination and internalisation, allow for intervention in terms of knowledge generated through shared experiences and models to connect these individuals through tacit knowledge where this knowledge is made explicit by experts through a systemising process that allows the transfer of this knowledge to the individuals for them to use it. Finally, in terms of the consumer component (in this case, the participants in the online discussion forum), the findings indicate that intervention should address the subcriteria, in that it should be needs-driven to ensure that individuals maintain interest, it should enhance online relationships through a shared interface and proactive feedback by the expert, and it should ensure loyalty and strengthened community feelings through the building and enhancing of trust and commitment; and long-term online relationships will be ensured if individuals are involved in the discussion through the exchange of information (trading and socially) and if they receive value from the interaction through the personalisation of information and rewards/gratification in the online discussion forum and can learn from the experience of an expert with the necessary know-how.

In terms of limitations of the research and findings, it is argued that the information obtained through the tracking study produced results without recourse to other models, which are usually based on more subjective premises. It would therefore be recommended that this article be seen as an exercise of exploration into the knowledge management intervention process, but should probably be simplified for future analysis. Although the main contribution of the study is that it augments to the limited empirical research in this area and provides a theoretical framework for future research in this field, it is limited by the fact that it only focussed on the measurement of knowledge management in one online discussion forum. Another limitation is the fact that limited insight into consumers' behaviour has been obtained, mainly because of the use of "lurking" in one online discussion forum.

However, the originality of this approach lies in the attempt to consider a distinctive approach to point to the simplest levels of analysis by choosing "differentiation" as a key word to guide the approach, something which is sometimes lost in more complex analyses. The main implication for practitioners and researchers from a practical point of view is that the application of the basic principles of the knowledge management approach illustrates that the management of knowledge creation and sharing through experts is possible, and the wealth of information obtained during the two time frames produced results which can be used by managers of these forums in future. It is worth mentioning that one of the key findings that stands out is that the participants in an online discussion forum quite often regard those members who manage the online discussion forum as "experts", but that organisations then run the risk that the knowledge created and shared might not support, and/or be detrimental to, the overall objectives and brand of the organisation. Every choice regarding information creation and sharing should thus follow the same line of thought to translate into the context of the communicative potential of the brand in its different dimensions to create and build on shared values, and this should be done by experts from the organisation itself. The study demonstrated that while content, communication and consumers are associated with knowledge management in virtual communities, this might differ from organisation to organisation, depending on the amount of intervention through knowledge management. However, the tracking study enhanced the findings of the first study and indeed indicated that organisations can use this theoretical framework to evaluate and translate these constructs in their online communities to strengthen the relationships and manage the information creation and sharing through intervention by an expert.

A growing understanding of knowledge management in virtual communities, specifically online discussion forums, and the proposed theoretical framework can be used as a possible area of future research to contribute to further assess this phenomenon in future. An exploratory validation of the framework has been proposed, and it appears to provide insight into how intervention through knowledge management in knowledge creation and sharing can be managed. This attempt may encourage organisations to support this approach towards online virtual communities which present the opportunity to "manage" such communities in future. The analysis revealed that knowledge management is possible and could be highly effective where such knowledge management is performed through significant intervention by experts in the information exchange process. The importance of further research in virtual communities to ensure the management of information creation and sharing is evident in the following quote by Gòmez (2007, p. 232): *Without cross-fertilization, the virtual communities of interest may end up reinforcing large, dispersed groups who share narrowly focused concerns.*

## References

Ardichvili, A., Page, V. and Wentling, T. (2003), "Motivation and barriers to participation in virtual knowledge-sharing communities of practice", *Journal of Knowledge Management*, Vol. 7 No. 1, pp. 64-77.

Arling, P.A. and Chun, M.W.S. (2011), "Facilitating new knowledge creation and obtaining KM maturity", *Journal of Knowledge Management*, Vol. 15 No. 2, pp. 231-250.

Barker, R. (2006), "Homo machinus versus homo sapiens: a knowledge management perspective of virtual communities in cyberspace", *Communicatio*, Vol. 32 No. 2, pp. 226-240.

Barker, R. (2008), "Measuring knowledge management in a virtual chat room: a case study", *Communicatio*, Vol. 34 No. 1, pp. 1-24.

Bell, D. (2001), *An Introduction to Cyberspace*, Routledge, London.

Bernier, R. and Bowen, J.P. (2004), "Web-based discussion groups at stake: the profile of museum professionals online", *Program: Electronic library and information Systems*, Vol. 38 No. 2, pp. 120-137.

Best, P., Manktelow, R. and Taylor, B. (2014), "Online communication, social media and adolescent wellbeing: a systematic narrative review", *Children and Youth Services Review*, Vol. 41, pp. 27-36.

Evans, M. Wedande, G. Ralston, L. and Van 'T Hul, S. (2001), "Consumer interaction in the virtual era: some qualitative insights", *Qualitative Market Research: An International Journal*, Vol. 4 No. 3, pp. 150-159.

Gòmez, R. (2007), "The nostalgia of virtual community: a study of computer-mediated communications use in Columbian non-governmental organizations", *Information Technology and People*, No. 3, pp. 217-234.

Hersberger, J.A. Murray, A.L. and Rioux, K.S. (2007), "Examining information exchange and virtual communities: an emergent framework", *Online Information Review*, Vol. 31 No. 2, pp. 135-147.

Hildreth, P.M. and Kimble, C. (2002), *The Duality of Knowledge, Information Research*, Vol. 8 No. 1.

Keyton, J. (2015), *Communication Research*, 4th ed., McGraw-Hill Education, North Carolina State University.

Killick, C. and Taylor, B.J. (2009), "Professional decision making on elder abuse: systematic narrative review", *Journal of Elder Abuse & Neglect*, Vol. 21 No. 3, pp. 211-238.

Kimble, C. and Hildreth, P. (2005), "Dualities, distributed communities of practice and knowledge management", *Journal of Knowledge Management*, Vol. 9 No. 4, pp. 102-113.

Maclaran, P. and Catterall, M. (2002), "Researching the social web: marketing information from virtual communities", *Marketing Intelligence and Planning*, Vol. 20 No. 6, pp. 319-326.

Nonaka, I. (1991), "The knowledge-creating company", *Harvard Business Review*, November-December, pp. 96-104.

Nonaka, I. and Takeuchi, H. (1995), *The Knowledge-Creating Company*, Oxford University Press, New York, NY.

Shannon, C.E. and Weaver, W. (1949), "The mathematical theory of information".

Soukup, C. (1999), "The gendered interactional patterns of computer-mediated chat rooms: a critical ethnoFigureic study", *The Information Society*, Vol. 15, pp. 169-176.

Streatfield, D. and Wilson, T.D. (1999), "Deconstructing knowledge management", *Aslib Proceedings*, Vol. 5 No. 1, pp. 67-71.

Styhre, A. (2003), "Knowledge as a virtual asset: bergson's notion of virtuality and organizational knowledge", *Culture and Organization*, Vol. 9 No. 1, pp. 15-26.

Taylor, T.L. (1999), "Life in virtual worlds", *American Behavioral Scientist*, Vol. 43 No. 3, pp. 436-449.

Trochim, W.M. (2006), "Deduction and induction", available at: saylor.longsight.com (accessed July 2014).

Wagner, C., Kawulich, B. and Garner, M. (2012), *Doing Social Research: A Global Context*, McGraw-Hill Higher Education, London.

Ward, K.J. (1999), "The cyber-ethnoFigureic (re)construction of two feminist online communities", *Sociological Research Online*, Vol. 4 No. 1.

Watts, D.J. (2007), "A twenty-first century science", *Nature*, Vol. 445 No. 7127, p. 489-489.

## Further reading

Ardichvili, A. Maurer, M. Li, W. Wentling, T. and Stuedemann, R. (2006), "Cultural influences on knowledge sharing through online communities of practice", *Journal of Knowledge Management*, Vol. 10 No. 2, pp. 94-107.

Miles, M. and Huberman, A. (1994), *Qualitative Data Analysis: An Expanded Sourcebook*, Sage Publications, Thousand Oaks, CA.

## About the author

Rachel Barker is a Research Professor in the Department of Communication Science at the University of South Africa, specialising in organisational communication. She received a Research Leadership Award from the University of South Africa's Women-in-Research programme and is a qualified C2-rated researcher at the National Research Foundation of South Africa. Rachel Barker can be contacted at: barker@unisa.ac.za