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A COMPARATIVE ANALYSIS OF KNOWLEDGE MANAGEMENT IN AN ONLINE DISCUSSION FORUM: A CASE STUDY APPROACH

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Abstract

Limited research has been conducted on online discussion forums, mainly because of the 'short lived' time period of the results. Furthermore, an inherent lack of process orientated, evolutionary perspectives of knowledge management as it pertains to these forums exist. To fill this gap, the aim of this paper is to draw on existing theoretical perspectives and to measure how intervention through knowledge management can contribute to the management of knowledge creation and sharing. This is done through a case study approach, specifically a comparative analysis, in an online discussion forum during two time frames. The paper introduces the key concepts, details the underlying theoretical framework, outlines the research methodology, data analysis and results obtained and concludes with the main research findings and implications of the study.

Key words: *Virtual communities; online discussion forums; knowledge management; knowledge creation and sharing.*

1. INTRODUCTION

> *Text-based discussion forums bring about a "virtual sociability" that is defined as a pragmatic dimension producing real-time applied knowledge …. And emphasise the collective memory by their multiple embedded values (e.g. social, informational, intellectual, political, technological) inherent in "democratic network lives".* (Bernier & Bowen, 2004:120)

Various authors realise the importance of managing the effect of knowledge creation and sharing in virtual communities, emphasising the need for interactive participatory communication, postmodernity and control in cyberspace. Given the fast changing cyber environment, constant technological advancements and relative lack of studies in this field (mostly because it is outdated before it is completed), this study sets out to access, through a case study approach, the impact of knowledge creation and sharing in virtual communities, an online discussion forum, through an comparative analysis during two time frames. The main research problem is therefore that little research has been conducted to measure the management of knowledge creation and sharing in virtual communities. The main aim of this paper is therefore to draw on existing theoretical perspectives to indicate how intervention in an online discussion forum, specifically the SouthAfrica.com discussion forum, can contribute to the management of knowledge creation and sharing in virtual communities. 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 and how it compares in the same online discussion forum during two specified time frames.

2. KEY CONEPTS

The following key concepts are prevalent for the purpose of this paper.

2.1 Online discussion forums

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 posting of user generated content (Barker 2008) and one example of an online social network or virtual community. These forums can address an entire online social community or a specific topic and the messages are usually displayed in either chronological order or as threaded discussion or a combination of both.

2.2 Knowledge creation and sharing

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 minimized 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 an collective of intellectual resources, implicating knowledge creation and sharing in various forms. The latter approach is specifically relevant in the context of this paper.

Existing viewpoints define knowledge management as the generation, storing, representation and sharing of knowledge to the benefit of the organisation and its individuals. Most knowledge management theorists perceive the organisation as a collective of intellectual resources, implicating knowledge in various forms and that it is important to ensure a comprehensive and understandable management initiative and procedures in the organisation (Bell 2001, p. 49). In terms of the theoretical constructs, knowledge management include three main components: communication (interactivity), technological aspects and the human component. Ardichvili, Page and Wentling (2003, p. 64) re-emphasises the human component of knowledge management and argue that one of the crucial aspects to determine virtual community's success, is motivated by active participating members of an organisation in these activities – thereby creating virtual knowledge-sharing communities.

Earlier Knowledge Management studies focused mainly on the capture and dissemination of knowledge. Since the mid 1990s, the focus shifted towards the CoP ideas, which lead to the first community of practice (or communities of knowledge sharing) which emerged in 1997 (Ardichvili et al. 2003, p. 66) and in the virtual world refers to VcoP's. 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 & Takeuchi 1995) as an essential part of everyday communication because it allows for the creation and sharing of knowledge.

3. THEORETICAL UNDERPINNING

Various researches proposed various models to investigate virtual communities or online social networks from a social, relational, learning, information exchange, knowledge management, information networks, members' needs, etc, depending on the discipline from which it is studied. Although specific models or frameworks have been developed to address specific research outcomes, a thorough literature review indicates that the theoretical underpinnings of existing research in this field

can broadly be categorised in terms of three main approaches. The first approach, a *representationalist approach*, indicates that knowledge is managed through the capturing, codification and storing of information (explicit knowledge). The second approach, the *constructionist approach*, focuses on knowledge as the outcome of a process of communication and social construction (tacit and implicit knowledge) (Kimble & Hildreth 2005, p. 102). The third approach, the *consumerist approach*, focuses mainly on insight into the consumer, whether needs, cultural aspects or influence of members on each other to name a few.

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 (TAM). In the constructionist approach, theorists focus on the communication of knowledge in virtual communities and use 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 (where knowledge can be made explicit) and softer aspects (which are less structured and difficult or impossible to articulate, therefore tacit which requires active interaction), as well as the Community Embodiment Model drawing on cultural notions of 'imagined community' which 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, and although various research have been conducted in this regard focusing on different consumer aspects, the most recent approach is the four-tier pyramid conceptual framework proposed by Hersberger, Murray and Rioux (2007, p. 136) which emphasises the information-sharing behaviours critical to build human relationships necessary for the development of online social networks.

Drawing from this and the knowledge management perspective, Barker (2008) proposed a theoretical framework which can be used to evaluate knowledge management in virtual communities and included some of the elements of the other approaches which was subsequently presented in terms of the following three main criteria (the 3Cs): content (technology), communication (knowledge creation and sharing) and consumer (human)s. The basic structure of the theoretical framework is presented in Figure 1.

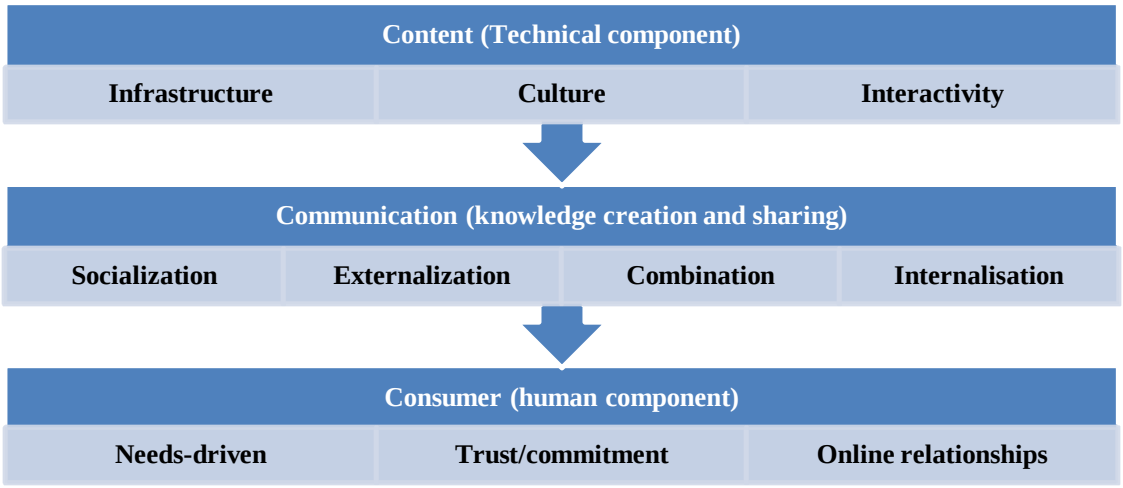

Figure 1: Theoretical framework to evaluate knowledge management in virtual communities

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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 3Cs: 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 and thereby creating or enhancing online relationships.

The sub criteria and elements of the first criteria, content, are presented in Table 1.

Sub-criteria	Elements
Infra-structure	• *Aesthetics/Figureical* control (images, Figureics, animations etc. that is visible and presents the first impression of like or dislike of the VC) • *Navigation*, *speed* and *reliability* (design of the technology, hardware/software and technical support to those performing their tasks) • *Accessibility* (design of the user interface) • *Capture and storing (*of relevant information about stakeholders through centralised customisation of information)
Culture	• *Consciousness of kind* (the feeling that binds individuals to the other community members and community brand) • *Shared artefacts, language, rituals and traditions* (to reproduce and transmit meaning in and out of the community and which perpetuate their history, culture and consciousness) • *Moral responsibility* (reflects the feelings that create moral commitment, duty or obligation and encourages group cohesion) • *Customer focus* (whether the information is directed to their needs) • *Reliability* (of the information communicated to ensure that it is perceived as valid and in line with expectations)
Interac-tivity	• *Flexibility and ease of use and participation* (of information) • *Speed and reliability* (of the design of the technology) • *Designed interface* (to allow shared interest, interaction/involvement, two-way communication and dialogue between the community members)

Table 1: Sub criteria and elements of the first criteria, content, of the proposed theoretical framework to evaluate knowledge management in virtual communities (Barker 2008)

Table 2 presents the sub criteria and elements of the second criteria, communication.

Sub-criteria	Elements
Socializa-tion	Socialization (when synthesized knowledge is *generated* through shared experiences, shared mental models and technical skills to connect people through tacit knowledge)
Externa-lization	Externalization (where tacit knowledge is made explicit to ensure that conceptual knowledge *development* takes place and it is made possible through knowledge articulation and knowledge of experts)
Combi-nation	Combination (the process where explicit knowledge is transformed through the integration and categorization of knowledge using a systemising process and data mining and this knowledge is then *transferred* to the consumer and can create value through the innovative communication of knowledge)
Interna-lization	Internalisation (where explicit knowledge is made tacit and this knowledge is then *used* by the consumer)

Table 2: Sub criteria and elements of the second criteria, communication, of the proposed theoretical framework to evaluate knowledge management in virtual communities (Barker 2008)

Table 3 presents the sub criteria and elements of the third criteria, consumer.

Sub-criteria	Elements
Needs driven	• *Transaction* (facilitates the buying and selling process through information delivery) • *Interest* (interpersonal communication where participants interact intensively with each other on specific topics and attract new participants) • *Fantasies* (which allow participants to create and share new stories, personalities, experiences and environments through interpersonal interactions and social experimentation) • *Relationship building* (which is created through the sharing of certain life experiences and bringing together of members) • *Shared interface* (also referred to as "piggyback" and is when VCs opt to amalgamate online with other providers to offer a wider range of information, thereby reducing overheads and obtaining increased competitiveness to capitalise on the member's interest) • *Feedback* (provided to members to encourage knowledge sharing and to reinforce active learning in VCs)
Trust/ commit-ment	• *Loyalty or e-loyalty* (indicated through the combination of repeat purchase behaviour, as well as social bonding) • *Emotional values* (of the consumer to explain brand selection decisions) • *Strengthened community feelings* (depend on the value the individual assign to the membership - the stronger the feeling, the more stable the community will be)

Online relation-ships	• *Involvement* (of participants in the communication that takes place) • *Social relationship bonds* (formed when repeated exchanges lead to positive judgments on the behaviour of the other party) • *Exchanges* (of information, trading and socially, between members) • *Consumer satisfaction* (the evaluative response of the product purchase and consumption experience where the consumer compares the expected value with the received value) • *Personalization* (of the communication that takes place which occurs when the consumer is involved and has a bond with the community) • *Rewards/gratification* (when the consumer perceives the relationship as having an expected and received value of the interaction) • *Expertise/know-how* (of those who create and share knowledge including involvement of other members of the community to participate and learn from the experience of others)

Table 3: Sub criteria and elements of the third criteria, consumer, of the proposed theoretical framework to evaluate knowledge management in virtual communities (Barker 2008)

The dimensions summarized in Tables 1 to 3 are closely related to each other, overlaps may exist and it might differ from organization to organization. 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, sub criteria and elements is therefore needed to ensure the effective management of knowledge in this process.

4. RESEARCH METHODOLOGY

Methods to measure the use of online social networks as virtual communities linked to the theoretical underpinning can broadly be categorised into three categories: methods for measuring web site usability and technological issues; methods to measure the behaviour of consumers or consumer-orientated methods; and methods to measure the communication in virtual communities. This research adopted a combination of all three methods in a theoretical framework, that is, an in-depth comparative analysis through a case study approach with the prime purpose to comprehend multifaceted meanings in a contextualised way. In this sense, a qualitative research design was employed based on a case study-based comparative analysis of an online discussion forum, namely SouthAfrica.com discussion forum (an open forum to all) during two specified time frames. This forum was selected through random sampling which is representative of most types of communication, with the main emphasis on consumer-to-consumer communication (C2C) and business-to-consumer (B2C) where 'business' in this context mainly refers to the 'expert(s)' in the organisation responsible for the management of the knowledge creation and sharing that takes place.

The use of the online discussion forum by different users or community members was monitored over the following two time frames: Timeframe 1 (TF 1) between 1 September 2003 to 1 September 2007 and Timeframe 2 (TF 2) between 1 September 2007 to 1 September 2012 on a 24/7 basis. The three main criteria, sub criteria and elements in Tables 1, 2 and 3 were used as the three variables of the theoretical framework to evaluate and measure the descriptions in the online discussion forum. For example, the element *navigation, speed and reliability* of the first criteria (Content) and sub criteria *infrastructure*, was measured by counting the amount 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 '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 organization tries to shape the community's history, culture and consciousness. The concept lurking connotes a way to learn the rules or norms of the community in the background to understand the language and subject matter before making a contribution and is more than merely netiquette or standards on conduct in virtual worlds (Evans, Wedande & Van't Hul 2001, p. 154).

Although most of these evaluations were subjective, the researcher tried to do a realistic measurement and applied key aspects consistently. Technical limitations probably also jeopardized some of the results. Important to note is that only the main "threads" or "first initiations" in the different forums, forum categories and forum sub categories were documented, not all the posts on a specific thread (which in some cases amounted to thousands). The data collected were coded and analyzed using the qualitative data presentation and analysis methods proposed by Miles and Huberman (1994), including development of summary sheets, coding of the online discussion forum in terms of the conceptual evaluation framework, weighting of the specific criteria and coding of the overall data. Important aspects listed by various researchers like Maclaran and Catterall (2002, p. 325), Taylor (1999), Ward (1999) and Soukup (1999) when collecting data in the virtual world were 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 their demographics like age, gender, etc.; membership of virtual communities change continually which needs an "opportunistic" approach to data collection; virtual research means rethinking, certain methodological limitations, lack of certain paralinguistic, 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 participant's 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 then leaves it to write up the findings – the virtual "field" is always present for the online researcher who can continue to participate in VCs during final stages of the research to check out the researcher's interpretation and even permit collaborative interpretation which can prevent objectification and ethical issues; and 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".

5. DATA ANALYSIS AND RESULTS

The data analysis and results of the comparative analysis of the data during the two specific time frames are subsequently discussed in terms of the following: the main criteria; the sub criteria and elements; and the main threads and first posts.

5.1 Results on the main criteria during both time frames

The criteria, sub criteria and elements listed in the theoretical framework were tabulated and weighted. Each of the three Cs was allocated equal weightings of 33.3 % and the sub criteria were weighted in terms of importance. For example, the criterion *Content* was allocated a weighting of 33.3 %, and the sub criterion *infrastructure* weighted 11, *culture* 11 and *interactivity* 11 1/3. The elements of each of

these sub criteria were allocated an equal weighting and the total amounted to the weights assigned to each of the sub criteria. The overall results of the measurement of the SouthAfrica.com discussion forum in terms of the main criteria (3Cs) of the proposed theoretical framework used during TF 1 and TF 2 are hence indicated in Figure 1.

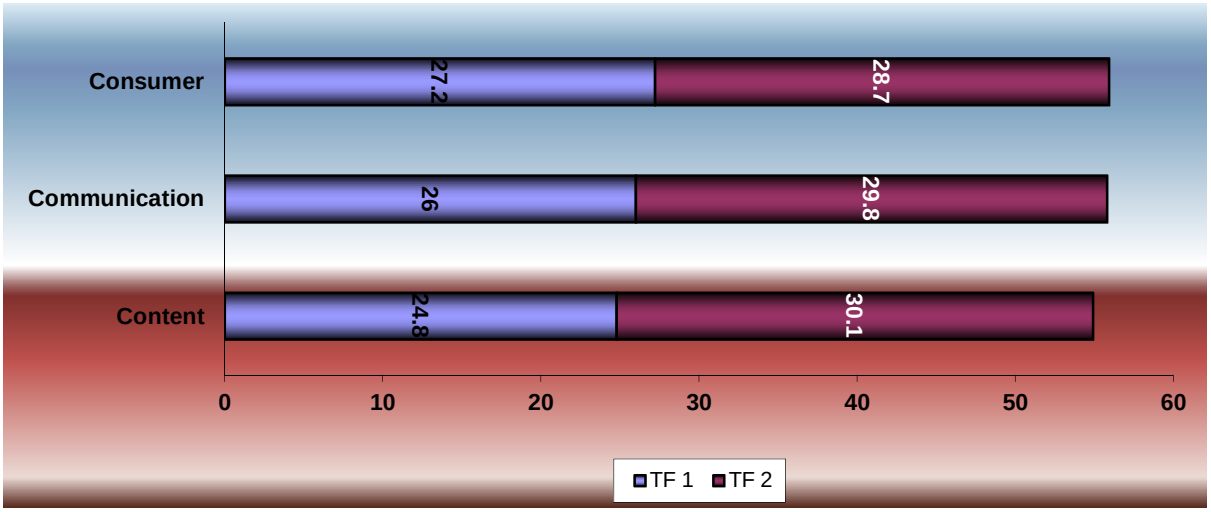

Figure 1: The results of the evaluation of the SouthAfrica.com discussion forum during TF 1 and TF 2 in terms of the main criteria (3 Cs)

Figure 1 shows that during TF 1 the SouthAfrica.com discussion forum chat room scored the highest in terms of the criterion *consumer* (27.2%), 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%), it was still higher than in TF 1 mainly 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% during TF 1 and 29.8% during TF 2. During TF 1 intervention or knowledge management from people who identified themselves as *experts with the know-how* (and in most cases provided substantiated data/feedback) were evident, whilst 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%) scored the lowest, but still fairly good 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 where a number of quotes were used and the data was stored for the last five years with constant reference to this data. In contrast, the criterion *content* scored the highest during TF 2 (30.1%), mainly because of the improvements made on the infrastructure (especially in terms of the elements *navigation, speed, accessibility, capturing and storing of information*); the culture created through elements like *shared artefacts, language, rituals and traditions* (which addressed the different cultures in South Africa to a much higher extent than during the previous time

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frame); and the increased posts is an indication of the *interactivity* (through a better *designed interface)* of the online discussion forum.

5.2 Results on the sub criteria of the three main criteria during both time frames

Main findings in terms of the sub criteria of the 3 Cs, *content*, *communication* and *consumer*, are indicated in Figures 2 to 4. Although the elements are not specified in the figures, the total results of each are reflected in the overall results of the sub criteria. In other words, the results ascribed to each element were used in the calculations of the total results of the sub categories and is indicated in the discussions after each figure.

5.2.1 Content

Content has been measured in terms of three sub criteria, 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 sub criteria are presented in Figure 2.

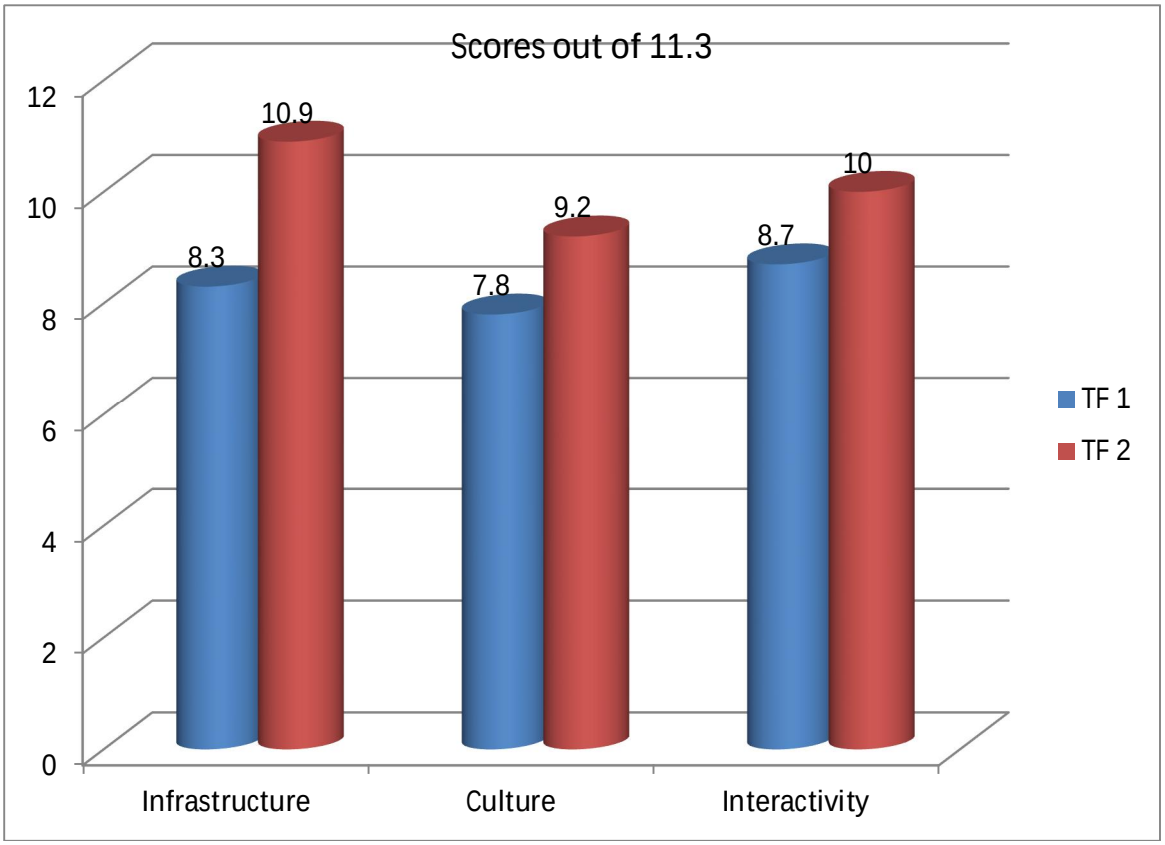

Figure 2: The results of the sub criteria of the first main criteria, *content,* of the SouthAfrica.com discussion forum

From the results indicated in Figure 2 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* have been included which might have hampered the first impression of the forum. An interesting fact noted was that all threats were rated 5/5 (Excellent) which might be 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 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 good interaction, reaction and interventions was made 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 focused 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. As this sub critera focused on interactivity between members of the group only, the SouthAfrica.com discussion forum scored very high in terms of the element *ease of use, participation and designed interface*, as well as interactivity in general between community members.

During TF 2, the scores were much higher than during TF 1. For example the sub criteria *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 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 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 focused, 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 relationships-building* between members of the group.

5.2.2 Communication

The criterion *communication* has been evaluated in terms of the following sub criteria with its relevant elements: socialization, externalization, combination and internalization. The results are presented in Figure 3.

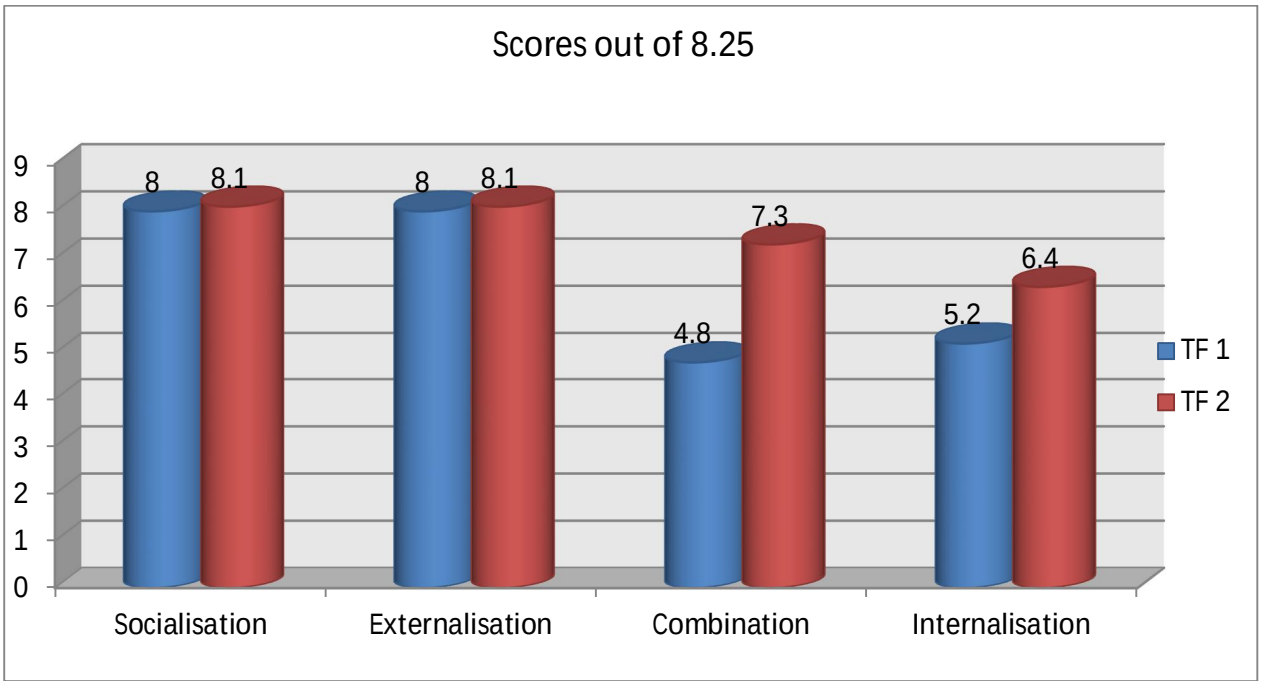

Figure 3: The results of the sub criteria of the second C, *communication*, of the SouthAfrica.com discussion forum

From the results in Figure 3 it is clear that during both TF 1 and TF 2 the sub criteria *socialisation* and *externalisation* scored very high, mainly because real sharing of knowledge took place through the *generation* of member's 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 sub criterion. During TF 2 the sub criterion *combination* scored much higher than during TF 1, mainly because of the integration and categorization of knowledge through the introduction of a systemising process and data mining which allowed the *transfer* of knowledge to create value. The last sub criterion, internalization, 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.

5.2.3 Consumer

Figure 4 presents the results of the measurement of the third C, *consumer* in terms of the following sub criteria: needs driven, trust/commitment and online relationships. It is important to note that some of the elements of the sub criteria have not been used because it 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).

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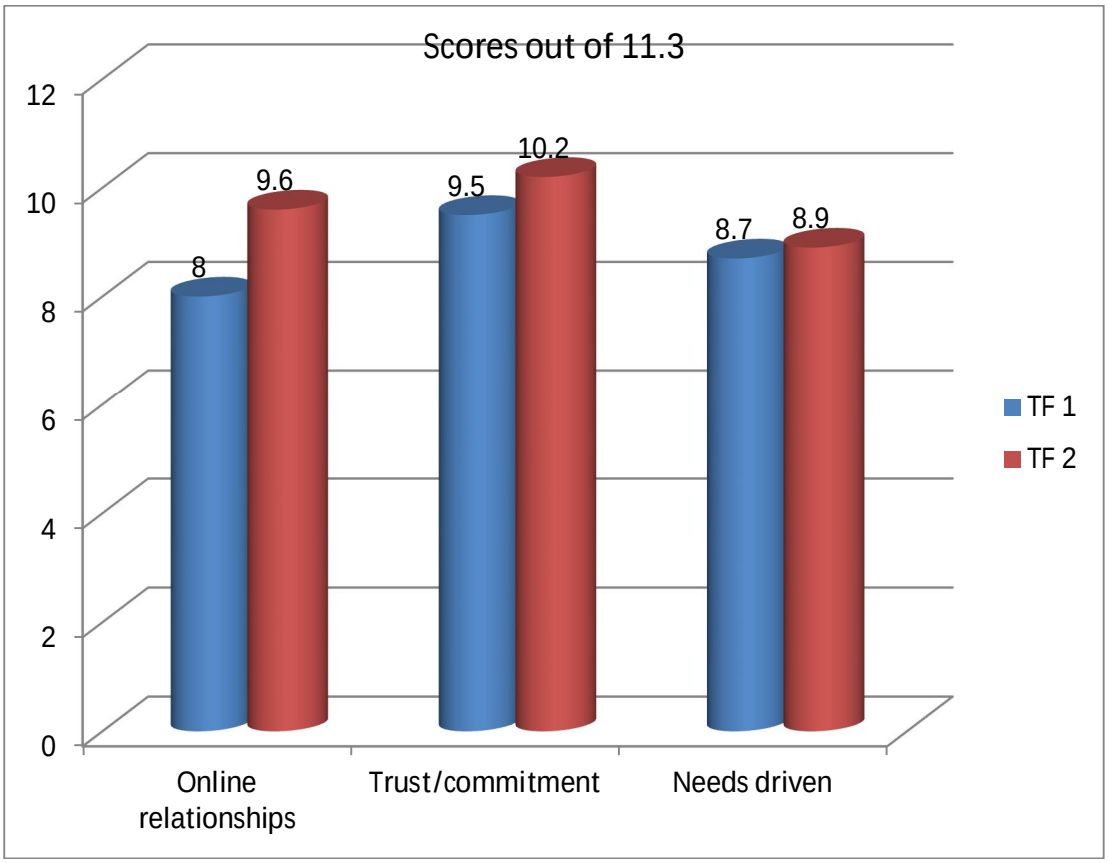

Figure 4: The results of sub criteria of the third C, *consumer,* of the SouthAfrica.com discussion forum

As indicated in Figure 4, the highest high score was allocated to the sub criterion 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 'pseudonames' (with names like "Woestynryer' who intiated the most discussions on a wide range of threads, "Assassin", "Scooby", "Theja", "Adonis", "Joovilhar" , "Ches", "Liza81", "Benjyboy", to name a few of the frequent users of the discussion forum. During TF 2 only a few members used pseudonames (like "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 sub criteria 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. Whilst a slightly higher score was allocated for TF 2 in terms of this sub criterion, it scored the lowest of the three mainly because no real difference was observable during TF 2 other than the fact than a slight increase in *feedback* was notable from 'experts' on specific topics which encouraged knowledge sharing and reinforced active learning. Whilst the sub criterion online relationships scored the lowest during TF 1, it scored second highest during TF 2, mainly because a strong *involvement* of the participants were 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 *personalization* (the members started to know each other) which led to a higher level of trust and commitment between the members to participate freely in the SouthAfrica.com discussion forum.

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

During TF 1, the online discussion forum monitored resulted in 115 first posts on a specific thread which was ordered chronologically according to date, not topics. The researcher categorized the posts and threads in terms of 10 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 Kruger National Park, shark attacks, freak storms and blazes); 5) *history* (early South Africa, apartheid mass graves, and San people); 6) *crime* (which are considered in terms of serious crimes like murder, rape, mobbing, etc and 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, Isreal, world debates and USA, etc) (Barker 2008).

During TF 2, the information was also ordered according to forums (on specific topics) which was totally the opposite than during TF 1 when it was ordered chronologically according to dates. Another important difference is that the forum was subdivided in different sub forums. Another interesting observation was that during TF 2, the recommendations made by the researcher after the monitoring of the online discussion forum during TF 1, were incorporated, especially by using topics, sub-topics and postings. Subsequently the site and postings were not ordered chronologically, but had 10 broad categories (which they referred to as 'Forums') with sub categories in the following order: 1) *guest book* (including the subcategories of messages from visitors on what they have to say and brief greetings); 2) *open board* (which included subcategories such as the sharing of photo albums, buy and sell ads, jokes or cartoons and searching for any topic); 3) *society* (which interestingly is interestingly enough 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); 4) *culture* (which also corresponds with one of the categories during TF 1 and includes a number of overlaps with the other categories in TF 1, with the following sub categories: cuisine, history, language, literature and film, music and art, religion, school projects and sport); 5) *personals* (including the subcategories personal questions and friendship networks, pen pals, genealogy and searching for people); 6) *gay and lesbian community* (where the subcategories include specifically stories worldwide and the gay dating network); *human rights* (specifically categories on stories of human rights issues in the South African context and internationally in terms of victims of the UNHCR); 7) *travel and tourism* (including the subcategories travel tips in and around South Africa, immigration information and moving/furniture); 8) *suggestions* (with subcategories like feedback to administrators and moderators which can be seen as a proactive knowledge management step); *archives* (which provides a link to two subcategories, namely all *mark forums read* and *view forum leaders*); and 10) *what's going on?* (with sub categories providing information on currently active users and statistics of the 7246 threads and the 31080 posts of active members which can be seen as 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 sub categories during TF 1, are indicated in Figure 4.

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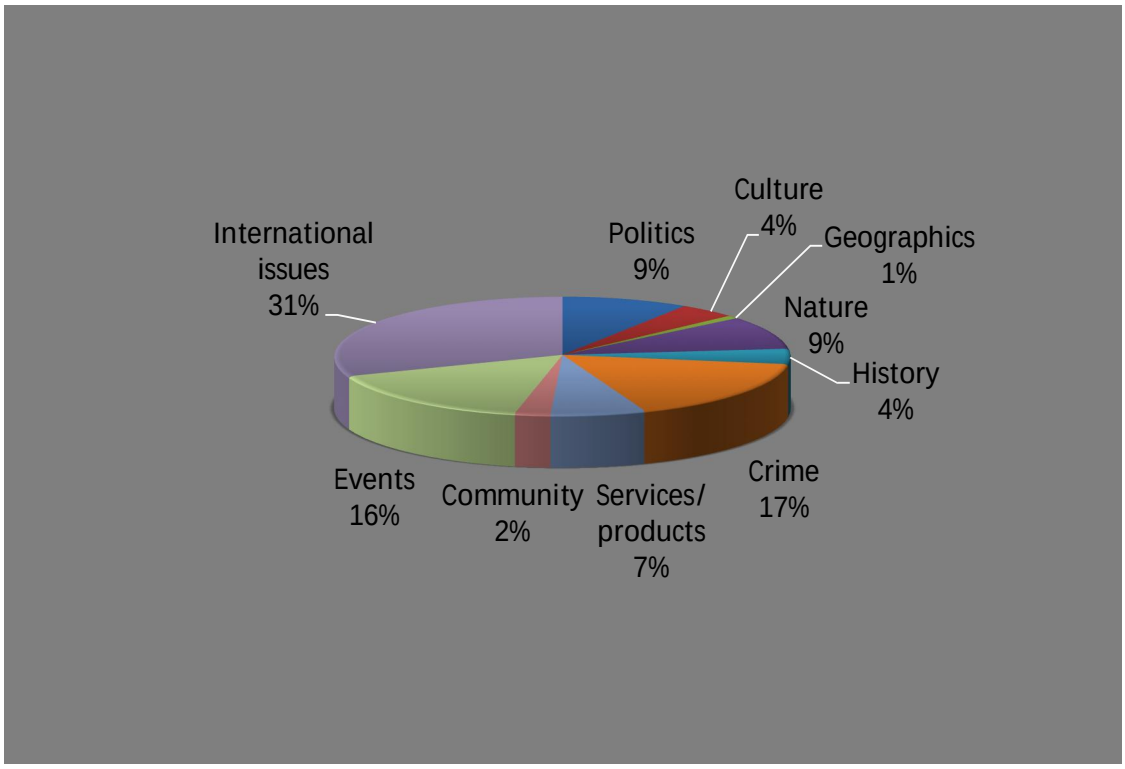

Figure 4: Main threads of the SouthAfrica.com discussion forum during TF 1

The calculations in Figure 4 were made in terms of the 10 main sub categories or initiations as categorised above for TF 1. In terms of this, most initiations were done in terms of *international news* (30%), (with a large number of threats on issues in Zimbabwe and Mugabe, followed by news in the USA, Europe and Africa), followed by *crime* (17%) (which was a major concern in the South African context), *events* (16%), etc.

Figure 5 presents the results of the main threads of the SouthAfrica.com discussion forum during TF2.

The calculations in Figure 5 were made in terms of the 10 main forums or sub categories as categorised on the forum for TF 2. In terms of the results, most of the threads were on the *open board* (22% with 1742 threads and 7186 posts), followed equally by *personals* (21% with 1617 threads and 2466 posts) and *culture* (21% with 1615 threads and 7360 posts). Although the latter two scored equally in terms of number of threads, it is clear that the posts on *culture* were almost 30% higher than in the *personals* thread with the most posts in the sub category *religion* (3716 postings). Interestingly, during TF 1 the sub category culture as a thread only scored 4% compared to the score of 21% during TF2. Another interesting observation is that the lowest percentages went to *human rights* (1% with 60 threads and 432 posts) and *gay and lesbian community* (1% with 69 threads and only 219 posts) in spite of the fact that it is currently dominant and much debated topics and the active role these activists take in these South African communities.

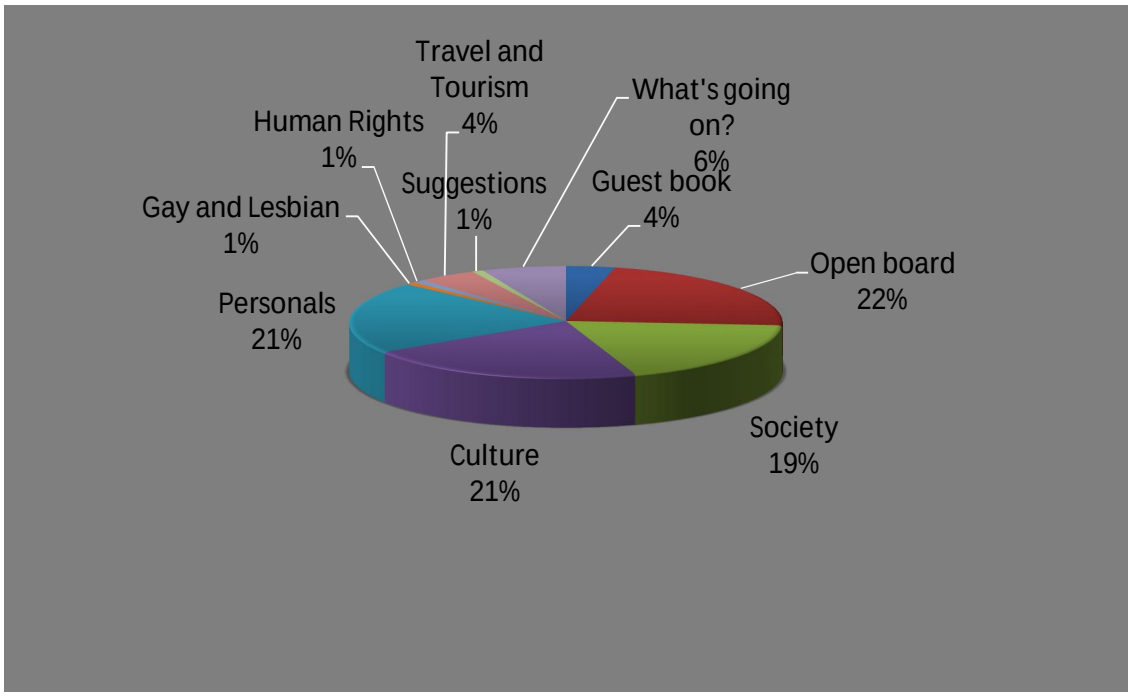

Figure 5: Main threads of the SouthAfrica.com discussion forum during TF 2

6. DISCUSSION

Crucial to the above process was the definition of key technical infrastructures and to convert it into measurable criteria. This allowed for the definition and development of knowledge management criteria in virtual communities, specifically an online discussion forum, through the use of online facilities for the creation and sharing of knowledge to either develop new relationships or to enhance existing relationships. Furthermore, this process allowed for a two-way communication orientated strategy, which at the same time increased the reach and richness of the interactive dialogue which took place between members of the online discussion forum in support of the organizational brand. Central to this process was the participation of all members of the online community in the creation and sharing of knowledge through their brand/service experience which was ultimately derived from the interrelationship between the 3Cs: content, which was mainly enabled through technical infrastructure; communication, which allowed for knowledge creation and sharing; and the consumer, which was needs-driven derived from active participation and interaction to build trust/commitment and thereby creating or enhancing online relationships.

It is also important to realize that new technologies, increasingly sophisticated customers and innovative products and services characterize the competitive environment. To get the full benefit on these trends, organizations need to recognize the need for momentous investments in and management of all knowledge assets, including employees (humans – the consumer), networks (communication) and infrastructure (technology – content). The study demonstrated that whilst content, communication and consumers are associated with knowledge management in virtual communities, it might differ from organisation to organisation, depending on the amount of intervention through knowledge management. However, the comparative analysis 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 in cyberspace.

7. LIMITATIONS OF THE STUDY AND FUTURE RESEARCH

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 focused on the measurement of knowledge management of one online discussion forum, the SouthAfric.com, during two time frames from an organisational perspective in terms of the 3Cs. Although limited insight has been obtained on consumer's through 'lurking' of the online discussion forums which was primarily subjective, future research might focus on specific aspects of the content (technical interface), communication (knowledge creation and sharing and intervention through experts), and consumers (to obtain feedback and to know how they think, gather and share information and make decisions on brands). Methods to do this can include focus groups, personal interviews or 'netnoFigurey' (internet ethnoFigurey). Furthermore, the results of this study can be used as basis for further research which should help to fill this gap and assess its importance in other virtual communities.

8. CONCLUSION

A growing understanding of knowledge management in virtual communities, specifically online discussion forums, and the proposed theoretical framework can contribute to further assess this phenomenon in future. An exploratory validation of such a framework has been proposed and it appears to provide insight into how knowledge creation and sharing can be managed in online virtual communities in terms of the three concepts: content, communication and consumer. This attempt may augment organisations to support this approach and undeviates online virtual communities which present the opportunity to 'manage' it in future.

This paper focused on the importance of knowledge management in the SouthAfrica.com discussion forum, thereby highlighting the extensive efforts needed to manage knowledge creation and sharing in cyberspace. A key issue is the constant monitoring of the discussion forum through concurrent and interacting processes to evaluate and influence the accuracy and management of information processing. This paper utilised a theoretical framework which combined the key components of existing perspectives in an interactive and integrated manner with the aim to address the current limitations in the evaluation of virtual communities. It detailed the key concepts and theoretical underpinning which was used to measure it through a comparative analysis in a case study approach on an existing and active virtual community, the SouthAfrica.com discussion forum, during two specified time frames. The analysis revealed that knowledge management could be highly effective and requires significant intervention through experts in the information exchange process.

The importance of further research in virtual communities to ensure the management of information creation and sharing, is probably 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.*

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