CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Hussey & Hussay (1997) define methodology as the overall approach of the research process starting from the theoretical underpinning to the collection and analysis of the data (Gill & Johnson 1997). Jayaratna (1998) estimates that there are over 1000 brand-named methodologies in use around the world. Like theories, methodologies cannot be true or false, only more or less useful. The methodology in any research is supposed to specify how the research will be conducted and controlled. The aim of this chapter is to provide the reader with an explanation of the research and methods used in order to satisfy the overall aim of this study. It is decided to utilise both primary and secondary research in order to achieve the objectives set and produce useful recommendations.

This chapter presents the design of the study (case study) including the rationale for the approach taken (mixed methods) and the methods of online repositories and data collection (web survey). The research design is followed by descriptions of the methods of data collection and the procedures employed for the analysis of the quantitative and qualitative data as detailed in the next chapters, and by a statement describing how the ethical implications impinging on the conduct of the study will be considered. Section 3.2 gives an idea of research methodology; section 3.3 explains the method for data collection and describes the sample population to be studied. Section 3.4 explains the data gathering methods including sampling and the design of the research instrument, and the data collection procedures. Finally, section 3.5 gives a summary of the research methodology.
3.2 Research methodology

Research methodology is a systematic investigation to find ways to a problem (Burns, 2000). There are many possible ways to look at the research methodology. However the approach proposed by Saunders et al (2000) seems very logical. They compared the research process to an onion by highlighting the layered approach to research. I will describe the layered approach, in the subsequent sections (see Figure – 3.1)

![Layered Approach to Research Process]

*Figure 3.1: The research process ‘onion’ (Source: Adapted from Saunders et al, 2000)*

According to Kuhn (1996) the research philosophy or paradigm is the, “set of standards to which practitioners refer”. Three views on research philosophy are relevant to the field of business and management research i.e. positivism, interpretivism and realism (Cooke and Davies, 2000) (see Figure 3.2).
Where positivism refers to the classic research and interpretivism is about conversational qualitative research. As shown in Figure 3.3, Johnson and Onwuegbuzie (2004) posit that the pragmatic approach for mixed methods allows for a pluralist view of research method- a middle position- as opposed to engaging in the old age duality debate about whether qualitative or quantitative methods are better (p.17). From research methodology perspectives, the approach taken, however, doesn’t map onto Figure 3.2. With regards to this research, the author has adopted a mixed method (triangulation) approach as case study and questionnaire is used to confirm different elements of research. This is supported by “positivist” to test underlying assumptions based on literature review. However, “interpretivist” approach is adopted when describing the cases from different CoP, and providing an explanation to the contents and discourse of the messages used.
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1.3 Research approach:

- Literature review
- Deductive research question
- Tools used:
  - Story telling
  - Discourse analysis
  - Content analysis

Online structured questionnaire
(8 case studies)

Observation

Data Collection

Corelational Analysis
Chi Square
Comparison
Mini Case Study

Quantitative Analysis
Qualitative Analysis

Reliability
Corelational Analysis

Data Analysis

Conclusion and Recommendations

Figure: 3.3: Research methodology (tools)

According to Nachmias and Nachimas (1996), there are two major schools of research approaches. The school that advocates making a theory explicit before embarking on
research is deductive approach (Popper, 1968). The second school advocates developing theory after the research is complete i.e., inductive approach (Merton, 1968). Quantitative methods largely use a deductive, hypothesis-based approach allowing for generalisations of results this approach moreover fails to incorporate new perspectives, whereas, inductive research fills this gap by generally relying on qualitative methods to help build theory (Denzin and Lincoln, 2000). Which approach to choose depends on the problem definition together with what kind of information is needed. However, two approaches can also be combined as shown in Figure 3.4, where it is suitable (Saunders et.al, 2000).

Figure 3.4: A comparison of deductive and inductive approaches (Source: Saunders et al, 2000)

With regards to this research this author felt that “deductive (data to theory) approach” was found to be the most suitable for the purpose of this study, as the purpose of the study is to gain deeper understanding regarding motivational aspects of participants in
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CoP using the issues identified by Wegner. By following the deductive approach this study is able to identify the key themes and factors that relate to peoples engagement in CoPs. Once the key issues and themes were investigated, inductive approach was used, as the aim of the study is not to make generalisations, but instead investigate different CoP, which intend to provide deeper understanding of the members’ engagement in the online CoP.

3.3 Research strategy

There are a number of approaches for empirical data collection. Depending on the character of research questions, to which extent the researcher has control over behavioural events and to what degree the focus is on contemporary events, the researcher can choose between experiment, a survey, a case study, grounded theory, ethnography and action research (Yin, 1994). This study was conducted using an online questionnaire survey and through observation of case studies of eight CoPs.

3.4 Time horizons:

According to Saunders et.al (2000) research can be “snapshot”, taken at a particular time, also called cross sectional or can be more similar to a “diary” and be a representation of events for a given period of time, also known as longitudinal. The main strength of longitudinal study is the capacity that it has to study change and development. Adams and Schvaneveldt (1991) point out that in observing people or events over time the researcher is able to exercise a measure of control over variables being studied, provided they are not affected by the research process itself. In addition time perspectives to research design are independent of research strategy.
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Whereas the cross sectional research is a study of a particular phenomenon at a particular time. According to Saunders et al (2000) research projects undertaken for academic degrees such as doctoral degrees are necessarily time constrained. However, the bulk of research design adopted in this study is ‘longitudinal’ as the study is of a particular phenomenon (e.g., people participation in specific groups of a CoP) within a particular time period. Whereas, the confirmatory test done in this study, using the online questionnaire that was distributed to the online CoP members, to revalidate the qualitative findings, can be ascribed as ‘cross-sectional’.

3.5 Research Design

Research design is the programme that guides the researcher in the process of collecting, analysing, and interpreting research observations (Nachmias and Nachmias, 1996). Whereas, research methodology is a system of explicit rules and procedures on which research is based and against which claims for knowledge are evaluated. Research methodologies also include sampling design, research design, data collection, data analysis, and limitation or constraints that the research faced.

3.6 Data Collection

For any research in order to reach its objective, the identification of an appropriate means of data collection is obligatory (Sarantakos, 1994). Generally a variety of methods is considered in order to form the basis to the research. However, a key question that proves to be prominent in the planning process concerned what category of data is desired for the assigned research. This issue is primarily created through the uncertainty of the
researcher as to the type of primary or secondary data should be used. Considering the above discussion, the following sections explain data collection methods required for the research with justification.

3.7.1 Secondary data:

Secondary research refers to already existing information and non-human sources such as previous research reports, often gathered for a purpose other than the researcher's needs (Zikmund, 1991). In this regard, Cooper and Schindler (1998) explains the importance of secondary data as it fills a need for a specific reference on some point to demonstrate why the proposed research fills a void in the knowledge base. Reviewing literature also helps sharpen the focus of research by understanding research gaps through the “limitations” section of earlier research, throwing light on likely research areas that reader need to concentrate. It also serves as a theoretical base helping to familiarise the reader with credible sources of academic work (Easterby et.al, 1991), underpinning the framework of the thesis. On a whole secondary research analysis allows the author to understand the nature of problem and the context before embarking on to the primary research.

Secondary data sources:

The researcher faced an uphill task when collecting the secondary data as the topic is quite new and till now there was less academic research done in this integrated area comprising of keywords Community of Practice, Multilingual Community of Practice, Degree of formalization etc. Despite of this challenge the author successfully collated articles from different backgrounds for the literature review. However, the main source of
secondary data for this study was the archived materials of different communities. For the qualitative part of this study I analysed the archived data (discussions of members of the CoPs) of 8 communities within the period of 2004 and 2008 to understand and explain why people engage in online CoPs, the role domain experts play in online discussions and also to investigate different types of interventions used by the moderators and the effectiveness of different interventions.

3.7.2 Primary research:

Primary research is a research, which is carried out or conducted to for a particular research problem and the characteristic of primary research is that it is first hand in nature and the information is collected exactly for that particular research problem. And it normally gathered directly from respondents using number of ways (Saunders, Lewis and Thornhill, 2000) like using structured or semi structured questionnaires, interviews, focus groups etc. The primary data is mainly collected to provide the data that would produce answers to the research objectives, compared to secondary data that is used to develop contextual or confirmatory elements of research.

Research studies could be exploratory, descriptive or explanatory (Zikmund, 1991). This research is "exploratory", considering the fact that it tried to explore totally new and less academic researched area. Exploratory studies answer questions of ‘how, what, when and where’ (Hart, 2000) and is useful to shed light on deeper understanding of the related issues.

3.7.2.A Sample Selection
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In general, potential members of a CoP go through a self-selection process, assessing what they can gain from their participation and what their contributions might be; if the resulting evaluation is positive, they will then volunteer to be part of the community and begin sharing their knowledge. Members are under no compulsion to continue their membership and are free to terminate their participation at any time they wish.

The aim of this study is to collect information and analyse the data of members’ engagement in the CoP. Overall 8 cases were chosen as these represent a cross-section of disciplines and representative topics using CoP online websites. Three criteria have been used to select the research sites for this study: accessibility, characteristics of CoP and commonly shared dimensions among the three research sites as shown in figure 3.5.
Specifically, the eight research sites used here:

(1) have permanent life span with no definite time frame in mind as an on-going mechanism for knowledge sharing, in contrast to having a temporary life span to accomplish a certain ad hoc purpose,

(2) have been in existence for more than 2 years,

(3) are established by a number of interested members (bottom-up approach) rather than imposed by a certain management (top-down approach),

(4) have a high level of boundary crossing because they involve members of different organizations,
(5) have more than 600 members, as from my pilot observations, I found that the communities that have less than 600 members, get very low responses, not due to the topic but the effectiveness/popularity of the community. My observations also indicated that it is only the blogging sites we can expect a lot of responses for a topic without having many members. In this study as I wanted to investigate on effective community of practice, I used my judgment as an expert in this field, to draw a line for an effective CoP with minimum 600 members to be investigated in this study.

(6) involve members scattered around the world, i.e. having a high level of geographic dispersion.

Additionally, the eight CoPs selected are culturally diverse because members have various educational backgrounds, come from disparate organizations, and are located in dissimilar international cultures. These CoPs are launched with a definite objective and theme in mind close to members’ day to day interests, hobbies or occupations. And finally, the selected CoPs are moderated.

3.7.3. Qualitative and Quantitative research:

This is always a topic of debate among researchers which research method is good for data collection. Some do favour of quantitative research methods and others qualitative research methods there are also another group of researcher who support the mix research of quantitative and qualitative researches

Typically qualitative data involves words and quantitative data involves numbers, there are some researchers who feel that one is better and scientific than the other. In
qualitative research, a hypothesis is not always needed to begin research. However, all quantitative research requires a hypothesis before research can begin.

Data that is qualitative in nature is characterised as being more flexible and unstructured when compared to the numerically based quantitative category. This technique employs a low number of observations in order to provide a detailed and deep insight into the issue or phenomenon (Ghauri, 1995). Qualitative methods of data collection are most suitable, when understanding and exploring are required about a specific research topic like what the thesis meant for (Thomas and Nelson, 1990). However, qualitative research has been criticised as a journalistic approach, a term used intentionally to imply an unscientific, subjective approach (Denzin and Lincoln, 2000).

According to Fred Kerlinger "There is no such thing as qualitative data. Everything is either 1 or 0" (Miles & Huberman, 1994, p40), to this another researcher, D. T. Campbell, asserts "all research ultimately has a qualitative grounding" (Miles & Huberman, 1994, p40). This seems right the everything can not be explained in only figures, like no one can quantified love, affection, emotions or loyalty for a brand in figures. Quantitative research often "forces" responses or people into categories that might not "fit" in order to make meaning Qualitative research, on the other hand, sometimes focuses too closely on individual results and fails to make connections to larger situations or possible causes of the results.

Despite the above criticism, Day (1989) in a journal article titled “Share of heart: What is it and how it can be measured?” strongly believed that probing enquiries regarding
innate feelings, attitudes and behaviour can best be investigated with qualitative research only. In this regard, the “Johari Window”, illustrated in the figure below, provides a conceptual model for understanding how qualitative research helps to uncover deeper attitudes and motivations of behaviour (Imms and Ereaut, 2002).

An analysis was undertaken to determine the most appropriate data collection method for this study. Table below provides a brief description of the common techniques as well as the main advantages and disadvantages of each of them.

Observation as a method is deemed appropriate for this study as the study aimed to discover individuals’ experiences and reveal their behaviours - which is what is mainly
uncovered through observation. Focus group and in-depth semi-structured interview is not selected as the preferred data collection method for this study.

3.7.3.1 Case Study.

According to Robson (1997) “Case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence”. Furthermore, Hussey and Hussey, (1997), state that, “Case studies are an extensive examination of a phenomenon of interest in which the importance of the context is critical. There are many types of case studies such as: descriptive case study, illustrative case study, experimental case study and explanatory case study.”

The term case study method is used to refer to "an empirical inquiry that investigates contemporary phenomena within its real-life context; when boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (Yin, 1989). However, the terms case study method and case study strategy have been used interchangeably. Stake (1995) distinguished between three purposes of case study. Firstly, the uses of a case study to understand and learn more about a particular field. This type of case study is called ‘intrinsic’ case study. Secondly, to understand something through studying something else. The aim is to accomplish something other than understanding a particular case. This type of inquiry is called ‘instrumental’ case study. Finally, collective case study refers to conducting a detailed investigation where more than one case is chosen.
A feature of the case study approach is that it can draw upon a range of data sources (Chetty, 1996). An exploratory qualitative case study approach involving the observation approach (Lincoln & Guba, 1985) is adopted in this study. The design of this study is influenced by Yin’s (2003a) epistemological position suggesting- “[The] approach to case study research favours emulation of the scientific method” (p. xvii). This includes posing explicit research questions, developing hypotheses, collecting empirical data, testing hypotheses, and developing conclusions based on the analysis of such data (Yin, 2003a).

Although the research questions of this study are not formulated as hypotheses, I adopted Burton and Schwen’s (2003) example, to collect data that would examine the validity of the motivators and barriers that are described in the knowledge sharing literature, as well as to discover any new motivators and barriers if applicable. This position also closely aligned with the post-positivist epistemology (Denzin & Lincoln, 2000). In addition, Yin (2003b) maintains that the case study approach is most appropriate under the following conditions (Burton, 2002):

I. *When it investigates a contemporary phenomenon within its real-life context:* The phenomenon under investigation is engagement and knowledge sharing among the members of the CoP. The phenomenon is studied in real-life context; in other words, there are no contrived circumstances in this study.

II. *When it embraces multiple sources of evidence:* Multiple sources of evidence – online survey and online observations was used to support any assertions/conclusions that I make.
III. *When it recognizes when the boundaries between the phenomenon and the context are not clearly evident:* Unlike an experimental study which “deliberately divorces the phenomenon from its context, so that attention can be focused on a few variables” (Stake, 1995, p. 23), I investigate member engagement and knowledge sharing within the context of eight online communities of practice. No deliberate divorce of knowledge sharing from the online communities of practice contexts is attempted.

*(a) Data Collection in Case Study*

In my research, I believe that using case study is key element for me to get deeper understanding of the research area. As the current authority in CoP literature Wenger (2004) suggested to use case study for CoP studies. He stated that case studies can be used to demonstrate the value created by communities, take the pulse of a community, evaluate the need for renewal, disseminate the stories of communities, encourage their development, understand what it takes, and learn from both successes and failures.

Depending on the extent of the case study, I used the following sources of data as shown in figure 3.7:

![Diagram](https://via.placeholder.com/150)

*Figure 3.7: Sources of Data*
The data was then turned into a case. I develop a story of a particular CoP from its origin to date, describe its structure, its activities, its leadership, and the organizational context.

### 3.7.3.2 Observation

Observation is often a useful method in case studies, especially in the managerial field when the observer or the researcher wants to understand and explore the differences of managerial behaviour towards specific phenomenon. This method is normally used in cultural studies when the researcher aims to understand a number of aspects such as customer behaviour to specific products, how customers take their buying decisions and also how managers respond and act upon specific questions. In this respect, Gummesson (1991) states, “Observation has been only partially accepted as scientific methods in management although it seems to meet with increasing sympathy”.

For the purpose of this study I was interested in exploring and observing the attitudes (or actions) of the members of the community, how they response to an on-line enquiry (questions), is it the discourse (content and the context) of the message is more important that makes members engage in the discussion; or is it the language, the syntax, the sender (the domain expert less active) or members. Indirect observation was used to monitor the movement of topics within the selected communities against time.

- **Analysing of Case Study Data**

**A. engagement Indices of Duration**

Table 3.1 is taken from Diemert et al (2002) in their evaluation of provincial tobacco control strategies as developing communities of practice.
This research considers Diemert et al (2002) criteria for assessing degree of engagement of CoP members. Adopting Diemert et al (2002) framework, specifically, the following engagement indices are developed:

<table>
<thead>
<tr>
<th>Continua</th>
<th>Definition</th>
<th>Points on the continuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number involved in engagement</td>
<td>The estimated proportion of ‘Community’ members that are facilitating or being a part of activities and ideas that matter and/or contribute to the ‘Community’</td>
<td>Few-Many</td>
</tr>
<tr>
<td>Duration of Engagement</td>
<td>The length of time that members engage on a specific project, topic, etc.</td>
<td>Short-term, Long term</td>
</tr>
<tr>
<td>Stage of engagement</td>
<td>The point to which the indicated engagement has progressed (for example, is this the first time members have engaged on this issue?)</td>
<td>Initial – Re-engaging – Terminal</td>
</tr>
<tr>
<td>Degree of Centrality</td>
<td>The extent to which members are involved with the ‘Community’</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1: Matrix of the enabling engagement (Diemert et al (2002))

<table>
<thead>
<tr>
<th>Continua</th>
<th>Points on the continuum</th>
<th>Forum activity index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number involved in engagement</td>
<td>Few to Many</td>
<td>Sub Forum activity index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Forum activity index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic engagement index</td>
</tr>
<tr>
<td>Duration of Engagement</td>
<td>Short-term, Long term</td>
<td>Topic life cycle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CoP maturity</td>
</tr>
<tr>
<td>Stage of engagement</td>
<td>Initial – Re-engaging</td>
<td>1. Total discussion period for each topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Duration period of the topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total life of the online Forum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Who posted the topic?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Who posted the first reply?</td>
</tr>
</tbody>
</table>
B. Membership status

In regards to members status, each community use their own levels and names but the common levels and terms that are used in most virtual communities are-
Junior Member (for newly joined members) or some contributing very little participation in discussion, senior member (who made substantiate contribution in the discussion) with quite a lot of participants, moderator (who can oversee specific forums), or administrator

Moderators oversee specific forums and their discussions. They generally have the ability to edit and delete posts, move threads, and perform other actions. Becoming a moderator for a specific forum is usually rewarded to users who are particularly helpful and knowledgeable in the subject of the forum they are moderating. Administrators are the people who have overall control of everything that happens on the board. They oversee how the board is styled, what forums to create and how to organize them, what information to require from members and who to appoint as moderators. Various membership levels for the chosen case studies are illustrated in Table 3.4.

However, there are literatures that provide some guidelines where CoP initiator and members can assume different roles for the technical operationalisation and discourse stimulations as identified in Table 3.3.

<table>
<thead>
<tr>
<th>Member</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>- Who posted the last reply?</td>
</tr>
<tr>
<td>Terminal</td>
<td>- How many times each person contributed to the discussion?</td>
</tr>
</tbody>
</table>

Table 3.2: Adopted from Matrix of the enabling engagement (Diemert et al (2002))
### Table 3.3: Roles of participants, moderator and system administrator in a CoP (adapted from ‘Online Policy Group’, 2002)

<table>
<thead>
<tr>
<th></th>
<th>CoP Participants</th>
<th>CoP Moderator</th>
<th>System Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>View post, view list of, search for, create, edit and delete messages, pictures, files, participants profile(s), schedule and search for events on a calendar, on a message board or on line</td>
<td>Create a new CoP, Edit CoP setting, Set calendar options, Delete (message, picture, file, profile, calendar entry or database entry)</td>
<td>installing, configuring CoP software, Backup CoP or CoPs, Freeze CoP or CoPs</td>
</tr>
<tr>
<td></td>
<td>Create, view, edit, and delete a, Conduct polls, enter information into a shared database, contact CoP moderator, contact system administrator</td>
<td>Edit participant list for given CoP, Contact system administrator regarding administration of all CoPs</td>
<td>Authorise moderator to perform moderator functions, Authorise system administrator to perform administrative functions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Backup or freeze CoP</td>
<td>Uninstall online Community CoP software</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Community/Platform</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Level 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allnurses (AN)</td>
<td>Registered User</td>
<td>Premium (Subscription fee</td>
<td>Patinium (Subscription Fee is</td>
<td>Guide (Moderator)</td>
<td>Staff (Administrative Staff)</td>
<td>Founder (the person who established this</td>
</tr>
<tr>
<td></td>
<td>(Free membership</td>
<td>required-unlimited access</td>
<td>required-unlimited access for</td>
<td></td>
<td></td>
<td>community)</td>
</tr>
<tr>
<td></td>
<td>- basic access)</td>
<td>for several services)</td>
<td>all services)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC Focus (SCF)</td>
<td>Member</td>
<td>Regular Member (Junior)</td>
<td>Member Plus (Senior)</td>
<td>Moderator</td>
<td>Board Owner</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(the person who established this community)</td>
</tr>
<tr>
<td>System Dynamics (SD)</td>
<td>Member</td>
<td>Junior Member</td>
<td>Senior Member</td>
<td>Moderator</td>
<td>Administrator</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Super Administrator</td>
</tr>
<tr>
<td>Young entrepreneur (YE)</td>
<td>Member</td>
<td>Junior Member</td>
<td>Senior Member</td>
<td>YE Veteran</td>
<td>Administrator</td>
<td></td>
</tr>
<tr>
<td>Teneric</td>
<td>Business Planning</td>
<td>Business Startup</td>
<td>Business Manager</td>
<td>Business Director</td>
<td>CEO</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mahjoob</td>
<td>Member</td>
<td>Junior member</td>
<td>Senior member</td>
<td>Moderator</td>
<td>Administrator</td>
<td></td>
</tr>
<tr>
<td>Alnj3</td>
<td>Member</td>
<td>Paid Membership</td>
<td>Golden Member</td>
<td>Assistant Supervisor</td>
<td>Supervisor</td>
<td>Advisor</td>
</tr>
<tr>
<td>Start up nation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 3.4: Membership levels within the research case studies*
C. Size of the message

In this research, I have classified the length (size) of messages based on word counts as it suggested by Woods & Keeler, 2001; Masters & Oberprieler, 2004. From looking at a number of messages in different CoPs I have used my judgment to decide the number of words as follows: 1-50 as “very short” message; 51-100 words as “short”; 101-250 “Medium”; 251-500 “Long”; 501-1000 “Very Long”; +1000 “extended contributions”.

For the understanding of the outcome of my observation and analysis of the eight case studies a detailed analysis of a case study (Start up Nation) is presented in the following section. It needs to be mentioned that, the structure and method of analysing all the cases are identical. Hence, a summary of the rest of the cases (All Nurses, Young Entrepreneur, Teneric, Supply Chain Focus, System Dynamic, Mahjoob, Alnj3) has been presented rather than presenting the detailed analysis as used in case – 1. In the summary of those cases, only new and value added information is included. This is to reduce the content of the main body and to keep it relevant. However, the detailed version of the seven cases (case 2- case 8) is included in the Appendix-1 to be used as a reference for the clarification of the findings that are summarised in the text.

D. Analysing Content of Discourse

For each case study, number of selected topics was chosen for further analysis. The analysis involved selection of topics with a relatively high, medium and low number of “replies” but also involved numerous participants. Topics with no replies are included as well.
In this regards, each reply in the online discussion was subjected to discourse analysis. As mentioned earlier discourse analysis involved content and context. For this study the content of the discourse is defined as:

- Technical Dialogue (Tech): Participants apply specific knowledge from a particular field(s). For example, case study Systems Dynamics (see chapter 4 for details)
- Experiential Dialogue (E): Participants use anecdotes and reflections based on from their own experiences to argue their case.
- Philosophical Dialogue (Ph): Participants refer to or are guided by a particular school of thought.
- Academic Dialogue (Ac): Participants draw upon wider academic knowledge.
- Story telling (ST): participants use this technique to make a point or share experience.
- Mixed (Mix): Participants combine two or more of the above categories.
- Other: Any statements that do not fit into any of the above categories

E. Analysing context of the discourse

In addition, the context of discourse within online discussion has been classified as follows:

- Explanation (Exp.): where a CoP member provides clarification of a point by giving reasons.
- Support: Where a CoP member shows one’s loyalty or approval of a belief or argument.
- Inquiry (Inq.): Where a CoP member is inquiring about specific knowledge to be clarified by other members
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- **Contradict:** Posts that encourage or challenge learners in debate by calling upon them to elaborate, or defend opinions. This can constitute a simple disagreement to a direct contradict.

- **Acknowledgement:** Posts that suggest the respondent has read the post. This is normally a short phrase or sentence

- **Mixed:** Participants combine two or more of the above categories.

### 3.7.3.3 Online Questionnaire survey:

In this context an online questionnaire survey directed at several specific CoPs are used to get some quantitative measurements to gain further knowledge and a way of verification to what has been elicited through case studies analysis. The success of questionnaire survey depends in part on establishing a representative sample that is large enough to allow researchers to be confident that the results can be generalised to apply to the wider population.

Brassington & Pettitt, (2003, page.247) guidelines were used to design the online questionnaire. I decided to use likert scale and rating scales which is in the form of strongly agree, agree, agree, neutral, disagree, strongly disagree and in the form of multiple-choice questions. These are widely used in attitude measurement, motivational research and in situations where a number of complex, interacting factors are likely to influence a situation.

The form of survey which was used in this study could be classified as a ‘descriptive survey’, what usually aims to explore the nature of existing circumstances. The survey was designed and distributed electronically. The despaired nature of practitioners (CoP members) and their undefined geographical dispersal made online survey method more appropriate than any other traditional survey method such as postal,
telephone interviews or personal interviews. Other advantage of this method is the online real time descriptive analysis of the collected data: I would regard this as an efficient way of collecting data in a short period of time with low cost from a wide range of CoP in the global set up. There are other advantages of using an online survey for data collection (Gay, Mills, & Airasian, 2006). These include confidentiality, easy scoring, standardizing of items and procedures, cost efficiency, result efficiency, and easy targeting of respondents (Gay, et al., 2006).

However, there are some limitations for questionnaire survey method. Some of these are; the difficulty of securing adequate responses especially as the motivation for answering the questionnaire is unknown. Also, responses should be accepted as given and incomplete or inaccurate information cannot be followed up (Nachmias & Nachmias, 1996). Other possible limitation for this method is the possibility of misunderstanding some questions by the respondents, but this could be captured through pre-testing the questionnaire by distributing it among selected testing sample. The main disadvantages include not reaching a population that is comfortable with the internet, not reaching a population that has e-mail, receiving multiple responses from a single participant, and receiving a small response rate (Gay, et al., 2006). However, this was not a problem in this study as the survey was targeted for the online audience only.

3.7.3.4 Quantitative Data Analysis

Quantitative and qualitative methods differ in the emphasis on validity and reliability. Greater emphasis is put on reliability when the study uses the quantitative approach. One of the objectives of a combined methodology is that both validity and reliability will be increased by resultant cross-checking of data.
Reliability is defined as the consistency of a measuring device (Spector, 1981). It was addressed by careful attention to unambiguous question wording and, in the survey, a large proportion of closed questions. When open questions were coded manually, a sample was tested by a colleague and proved satisfactory.

Statistical analysis was performed on the survey responses and secondary data using mainly SPSS for Windows software (version 14). The quantitative analysis was performed to test the research hypotheses on the research questions discussed in Chapter 5. This is a means of understanding knowledge sharing in online CoPs.

The process of statistical analysis went from basic descriptive statistics through bivariate analysis to multiple analyses. Thus, as the focus of the analysis narrowed, the depth increased. Mean comparison (chis square) and correlation analysis was employed in testing the hypotheses that are related to knowledge sharing in online COP. One-tailed Spearman correlation coefficient was used because the variables are measured on an ordinal scale (Bryman and Cramer, 1997; Sekaran, 2000). Table 3.5 suggests the rule of thumb on correlation coefficient size. A correlation that is significant at the 0.05 level is indicated by two asterisks (**) and a correlation that is significant at the 0.01 level is indicated by one asterisk (*). Sekaran (2000) states that high correlation of 0.75 or above might indicate the invalidity of a measurement because it indicates that the variables are not different and distinctive.

<table>
<thead>
<tr>
<th>Coefficient Range</th>
<th>Strength of Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>+/- 0.91 - 1.00</td>
<td>Very strong</td>
</tr>
<tr>
<td>+/- 0.71 - 0.90</td>
<td>High</td>
</tr>
<tr>
<td>+/- 0.41 - 0.70</td>
<td>Moderate</td>
</tr>
<tr>
<td>+/- 0.21 - 0.40</td>
<td>Small but definite relationship</td>
</tr>
<tr>
<td>+/- 0.01 - 0.20</td>
<td>Slight, almost negligible</td>
</tr>
</tbody>
</table>

*Assume correlation coefficient is statistically significant
Chi-square test was performed for a detailed statistical test, used to assess differences between groups using nominal or ordinal results (Hair et al., 2003). The chi-square is one of the most popular statistics because it is easy to calculate and interpret. There are two kinds of chi-square tests. The first is called a one-way analysis, and the second is called a two-way analysis. The purpose of both is to determine whether the observed frequencies (counts) markedly differ from the frequencies that we would expect by chance.

The observed cell frequencies are organized in rows and columns like a spreadsheet. This table of observed cell frequencies is called a contingency table, and the chi-square test if part of a contingency table analysis.

The chi-square statistic is the sum of the contributions from each of the individual cells. Every cell in a table contributes something to the overall chi-square statistic. If a given cell differs markedly from the expected frequency, then the contribution of that cell to the overall chi-square is large. If a cell is close to the expected frequency for that cell, then the contribution of that cell to the overall chi-square is low. A large chi-square statistic indicates that somewhere in the table, the observed frequencies differ markedly from the expected frequencies. It does not tell which cell (or cells) are causing the high chi-square...only that they are there. When a chi-square is high, you must visually examine the table to determine which cell(s) are responsible.

If there is only one column or one row (a one-way chi-square test), the degrees of freedom is the number of cells minus one. For a two way chi-square, the degrees of freedom are the number or rows minus one times the number of columns minus one. Using the chi-square statistic and its associated degrees of freedom, the software
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reports the probability that the differences between the observed and expected frequencies occurred by chance. Generally, a probability of .05 or less is considered to be a significant difference.

For all types of statistical tool used, a thorough discussion of the technique is found in chapter 5.

3.7.3.5 Reliability and Validity

To increase the credibility of research the attention has to be paid to two particular important aspects in research design i.e., reliability and validity (Saunders, Lewis & Thornhill, 2000). According to Easterby-Smith et.al (1991:41) reliability can be assessed by posing the following two questions:

- Will the measure yield the same results on different occasions? (Deductive approach)
- Will similar observations be made by different researchers on different occasions? (Inductive approach)

According to Yin (2003b), measures for increasing the quality of an exploratory qualitative case study research design can include tactics related to issues of reliability and validity. These tactics are described in this section.

Reliability is one of the most important criteria that can be adopted if a certain theory or method is followed. In qualitative research validity receives more attention than reliability,(Flick Uwe, 1999). Like wise validity is concerned with whether the findings are really about what they appear to be about. The validity and reliability of the qualitative data depends to a great extent on the methodological skill, sensitivity and integrity of the researcher (Patton, 1990).

A. Reliability
Qualitative researchers view reliability as the fit between what really happens in the setting under study and what is recorded as data (Taylor & Bogdan, 1984). Yin (2003b) explained that the objective of achieving reliability is to help make sure that the operations of a study, such as the data collection procedures can be repeated, with the same results. In other words, if a later investigator followed the same procedures as described by an earlier investigator and conducted the same case study all over again, the later investigator should arrive at the same findings and conclusions. The overall goal of reliability is to minimize the errors and biases in a study. Given this view, qualitative researchers are advised the following methods to ensure reliability of their studies: fully explain their methodological procedures, describe the role (including assumptions or biases) of the researcher, state clearly the research questions, and leaving an audit trail (Bogdan & Biklen, 1992; Marshall & Rossman, 1995; Yin, 2003b). Researchers may also employ the use of interobserver agreement to record the occurrence or nonoccurrence of specific behaviors under study. According to Martella et.al. (1999) interobserver agreement can provide information regarding whether the operational aspects of a certain construct and the measurement procedures can be replicable. Inter-observer agreement can also provide information with which to assess the believability of the reported data (ibid). Confidence in the reported findings is increased when two independent observers achieve a high degree of agreement regarding the occurrence of a specific construct being measured; indicating that the study can be repeated with the same results. This helps enhance the reliability of the study.

In this study, all the aforementioned techniques were implemented to increase reliability. I explained my methodological procedures, including data collection and
data analysis methods in detail, stated my research questions as clearly as possible, and left an audit trail that documented the actual online communication postings of the eight research sites, interview data, preliminary notes, and coding sheets of the data. I also described my role as a researcher (described in a subsequent section).

B. Validity

Due to Denzin (1989), I used the following five techniques to increase the validity of this study: (i) data source triangulation, (ii) investigator triangulation, (iii) member check, (iv) the disclosure of researcher bias, and (v) analytical generalization.

i) Data source triangulation- Data source triangulation has three subtypes (Denzin, 1989): (a) time, (b) space, and (c) person. Regarding data source triangulation, I collected data from eight different CoPs with diverse subject areas where knowledge sharers (person-triangulation) who had different levels of qualifications and experience, hailing from different parts of the country and world (space-triangulation). The postings of knowledge sharers were also gathered in different time period to understand if there is any impact of time on the knowledge sharing (time-triangulation). Varying the data sources across time, locations and people yielded multiple opportunities to examine the accuracy of the data, as well as minimized the threat of introducing random errors due to the drawing of premature inferences based on unique instances.

ii) Investigator triangulation- Investigator triangulation consists of using multiple researchers, as opposed to a single researcher (Denzin, 1989). Not every scholar is agreeable to this practice. For example, Lincoln and Guba (1985) posit that it is a mistake to “expect corroboration of one investigator by another” (p. 307). I do agree that PhD is an independent piece of research. I disagree, however on the Lincoln and
Guba’s statement. My stand is congruent with that of Denzin (1989) who favours the use of multiple investigators because it can “expand the interpretative base of the research and reveals elements of the phenomenon that would not necessarily be seen by just one researcher” (p. 245). In this study, I worked under close supervision of my supervisor (in a limited way) who has expertise in the field of knowledge management and communities of practice to review the design, data analysis, as well as discuss and affirm emergent findings, and provide suggestions for further analysis. The expert also discussed with me the choice of CoP’s that need to be investigated and studied to get a cross-sectional response.

**iii) Member check**- Member check involves the members of the CoPs being given the opportunity to validate their views which I report in the study. According to Stake (1995), this is a useful process because the interviewees can “provide critical observations and interpretations” (p.115) that I might have missed out. It is important to highlight here that there are conflicting opinions among scholars as to whether the participants of the study should review their own data. Stake (1995), for example, feels that participants should have the opportunity to validate their data as part of a follow-up process. Fielding and Fielding (1986), however, disagree and state that “there is no reason that members [participants] have privileged status as commentators in their actions…such feedback cannot be taken as direct validation or refutation of the observer’s [researcher’s] inferences” (p. 43). This contrast in opinion may be attributed to the expertise of the researcher. If the researcher is not an expert in the area of the participants’ domain, then he/she might favour member checking. If the researcher is knowledgeable in the participants’ domain, he/she might avoid it. Since in this study, I did not consider myself an expert in any of the participants’
domain, I favoured the use of member checking. Furthermore, I wanted to be sure that I correctly represent the participants’ views and opinions.

iv) Analytic generalization- While quantitative research is concerned with statistical generalization, qualitative case studies rely on analytical generalization (Yin, 2003b). Yin (2003b) explains that in analytical generalization, an investigator strives to generalize a particular set of results to some broader theory, rather than to a population. In this study, I attempted to generalize my findings to the broader theory of motivators and barriers of knowledge sharing and engagement in the online CoP which I had described in the Review of Literature chapter. Specifically in the Conclusion chapter, I attempted to discuss the extent my findings validate these theories.

v) Role of Researcher- Researchers can influence qualitative data. To help minimize such influence, Patton (1990) suggests that the researcher reports “any personal and professional information that may have affected data collection, analysis, and interpretation – either negatively or positively – in the minds of the users of the findings” (p. 472). In this study, I adopted the role of an uninvolved online observer. Furthermore, since I did not have any stake in either one of the eight CoP research sites, there is no conflict of interest on my part when I observed the members of CoPs. There is therefore no cause for concern about the issue of my influence over the participants in the course of my study. However, I took active part while sending the questionnaires to various online communities in order to collect quantitative data. Table 3.5 below summarizes the various techniques that I used to enhance the reliability and validity of this study.
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<table>
<thead>
<tr>
<th>Reliability</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully explain my methodological procedures</td>
<td>Empirical data to support that the three research sites are communities of practice based on Wenger’s (2001) three characteristics</td>
</tr>
<tr>
<td>Describe my role as a researcher in the study</td>
<td>Theoretical argument based on literature that communities of practice can exist online</td>
</tr>
<tr>
<td>State clearly my research questions Data source triangulation across time, space and person</td>
<td>Leaving an audit trail use of investigator triangulation</td>
</tr>
<tr>
<td>Interobserver agreement of the types of activity engaged by members</td>
<td>Member checking by participants of my interpretation of the observation data</td>
</tr>
<tr>
<td>Interobserver agreement of the types of knowledge shared by members</td>
<td>Disclosure of researcher role Analytical generalization rather than statistical generalization was used</td>
</tr>
</tbody>
</table>

Table 3.6: Summary of reliability and validity techniques used in the study

3.8 Discussions:

The nature of the research questions required the selection of a mixed methods approach for the conduct of this study that “employs strategies of inquiry that involved collecting data…sequentially to best understand research problems [and which include] both open and closed ended questions, both emerging and predetermined approaches, and both quantitative and qualitative data and analysis” (Creswell, 2003, pp. 18-19). The use of a ‘mixed methods’ triangulation approach is supported by Sturman (1997, p.62) who suggests that qualitative approaches may be usefully deployed “in explaining more fully findings from quantitative research” and by Johnson and Onwuegbuzie (2004, p. 15) who point out the flexibility that a mixed methods approach “allows researchers to mix and match design components that offer the best chance of answering their specific research questions.” The advantage of using a “complementarity” mixed methods approach for this study was that the results of the online survey could be used to “develop” and explain the rule of online engagement in CoPs elicited through case studies. This not only allowed more in-depth in the data collection but also contributed to the “completeness” of the data. As Greene et al (1989, p. 258) suggest, “qualitative and quantitative methods are used
to measure overlapping but also different facets of a phenomenon, yielding an enriched, elaborated understanding of that phenomenon”.
3.9 Summary

There are four main types of qualitative research, namely, Phenomenology, Ethnography, Case Study and Grounded Theory. Phenomenology, the first major approach to qualitative research, is a descriptive study of how individuals experience a phenomenon. Ethnography on the other hand is the discovery and description of the culture of a group of people, whereas case study is an in-depth description and analysis of one or more “cases”. Finally, the Grounded theory approach is an inductive approach to develop theory. An inductive method is where a theory or framework is developed using raw data. This is different to a deductive approach which involves using collected data to accept or reject a theory.

This chapter has focused on fulfilling the requirements of the research objective and questions. It has done this by considering firstly the over-arching research approach in the context of the research setting, and has secondly examined the methods through which this strategy can be realized.
Critically drawing on the experience of other researchers a number of data collection methods were assessed for suitability. A selection was then made on the basis that the different methods’ complimentary fit could provide data that is useful in answering the research questions. A multi-method approach was taken so as to maximise the benefits of the case study approach, but also to strengthen the overall study through methodological triangulation.

The current study used mainly the qualitative research approach of case study analysis through observation as it attempted to develop a high level framework of the main issues involved in the CoP, primarily investigated by Wegner (2000). Since this research is exploratory, the study followed both qualitative and quantitative research approaches (triangulation approach) and aimed to enhance existing theories and practices of Community of practice from a holistic perspective.

By considering the available research options in light of the research environment and research questions, it has been possible to develop a theoretically suitable plan. In concluding this chapter, the methodology will be used in this research has been discussed with the variety of data sources that will be used (data triangulation). The online questionnaire and case study was conducted in order to meet the research goals. This research could be described as a descriptive and theoretical review for community of practice.