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IS UNIFIED COMMUNICATION A VITAL TOOL FOR EFFECTIVE LEADERSHIP IN VIRTUAL TEAMS?

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of MASTER OF BUSINESS ADMINISTRATION

11 November 2013

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ABSTRACT

Virtual teams are defined as geographically dispersed teams who work together across time and space using information and communication technologies to accomplish one or more organisational tasks (Piccoli, Powell, & Ives, 2004). As virtual team members are physically distributed, they often need to work together as teams without ever meeting each other using only technology and electronic communication to collaborate, communicate and share information. Previous studies have shown that electronic tools are ineffective and do not aid in building trust and common understanding in a virtual team environment. This study challenges these previous findings and assesses the use of unified communication as a tool for leading virtual teams.

Many organisations use different tools such as e-mail, instant messaging, IM presence, conference calls, voice calls and video calls. The concept around unified communications is the integration of data, voice and video into a single tool. Is unified communication an effective tool for leading virtual teams?

This research paper defined the sample population as any team member working in a virtual team anywhere in the world. Data was collected from one large multinational with offices in 112 countries as well as virtual team members around the globe. The sampling technique used was based on non-probability (subjective) sampling. The sample size of 220 individuals, representing virtual team members was originally targeted for this research. Data was collected over a three month period with two hundred and thirteen (213) responses received from thirty seven (37) countries using both qualitative and quantitative methods.

The study found that effective communication is vital for the success of virtual teams. It found that even though communication tools are vital, a unified communication toolset was not necessary as only some components of a unified communication tool were used on a day to day basis. Some components in a unified tool were regarded as nice to have but not vital.

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KEY WORDS

Virtual Teams, virtual organisations, distributed teams, global teams, unified communication, electronic communication, global mind-set, face-to-face teams, globalisation, leadership.

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DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

…… 11 November 2013

Mohammed Ariff Nabi

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CHAPTER 1: INTRODUCTION TO THE RESEARCH PROBLEM

1.1 Background

Cummings and Worley (2009) stated that there are three major trends that are changing the shape of organisations. These trends are globalisation, information technology and managerial innovation. Globalisation has changed the business environment as geographical boundaries have become blurred creating a new global economy with both opportunities and threats. Advances in information technology has redefined the way resources in organisations work, communicate, share and collaborate. Managerial innovation has responded to these trends and have developed new and innovate ways to manufacture goods and deliver services (Cummings & Worley, 2009). Virtual teams is one such innovation.

Virtual teams consist of individuals who collaborate in geographically dispersed teams and may reside in different continents, countries and time zones. Martins, Gilson and Maynard (2004) report that 50% of all companies with more than 5000 employees use an element of virtual teams for conducting business. However, virtual teams have a number of challenges ranging from technological challenges to cultural challenges. This research will look at some of the challenges within virtual teams with a particular focus on the communication challenges and the use of unified communication to address these challenges (Aldea, Popescu, Draghici, & Draghici, 2012).

This chapter introduces the research topic, the research objectives and provides a comprehensive background and introduction to virtual teams and unified communications. The relationship between the research problem and the research objectives are discussed and the motivation for writing this paper is also covered.

1.2 Research Problem and Objectives of the Research

Globalisation is defined as a process which lessens the need for international boundaries. Modern communication technology, from telephone, radio, television and the internet make it possible for people to connect and interact with each other despite the large geographical distances between them (Crane & Matten, 2010). With globalisation, the geographical

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boundaries are blurred as organisations compete for the same customer base regardless of their location. Organisations that are best geared to take advantage of opportunities created by globalisation have changed their teams from traditional co-located teams to dispersed virtual teams (Montoya, Massey, Hung, & Crisp, 2009).

Globalisation has resulted in companies servicing customers in multiple countries throughout the world. Company resources are located in different continents, regions and time-zones. To service this global customer base many organisations have created virtual teams. Virtual teams are on the increase with the total number reaching a quarter of a billion people in 2008 (Bergiel, Bergiel , & Balsmeier, 2008). Due to globalisation, many organisations have decentralised their work processes using virtual teams with team members geographically dispersed to manage their day-to-day activities using electronic means and communication technologies (Guido, Susanne, & Udo, 2005).

Virtual teams are defined as geographically dispersed teams who work together across time and space using information and communication technologies to accomplish one or more organisational tasks (Piccoli, Powell, & Ives, 2004). Virtual teams however, have their own challenges. As virtual team members are physically distributed, they often need to work together as teams without ever meeting each other using only technology and electronic communication to collaborate, communicate and share information (Piccoli, Powell, & Ives, 2004).

Successful organisations today use Information Technology as an enabler and can rapidly adapt to the fast-paced competitive environment to meet customer demands (Davidow & Malone, 1992). One of the building blocks to achieving this competitive edge is through the use of virtual teams (Piccoli, Powell, & Ives, 2004). A number of enablers are used to create successful, effective and sustainable virtual teams. It is vital for leaders of virtual teams to understand these enablers and to optimise the output of their teams. The key enablers for virtual teams are discussed in later chapters. As a result of globalisation and the blurred global boundaries, virtual teams are expected to grow substantially in the near future (Lipnack & Stamps, 1999).

To effectively lead or manage virtual teams around the globe, leaders require a specialised set of skills and communication tools (Curseu, Schalk, & Wessel, 2008). Previous studies have shown that electronic tools are ineffective and does not aid in building trust and common understanding in a virtual team environment. The lack of face-to-face contact has been reported as one of the main challenges when managing virtual teams (Oertig & Buergi, 2006).

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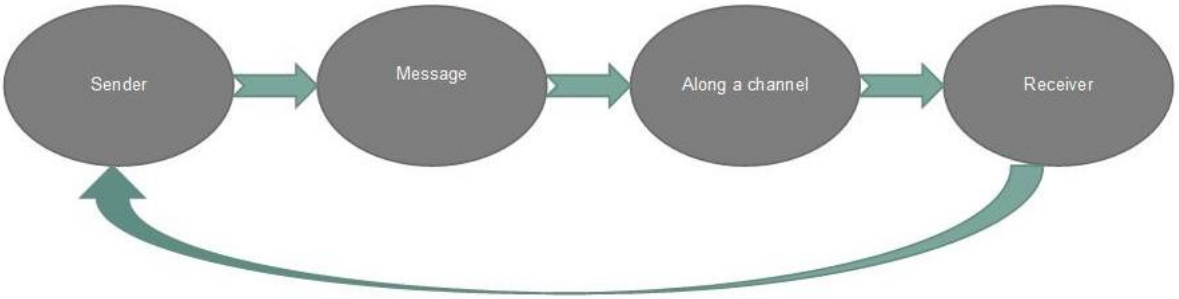
Piccoli, Powel and Ives (2004) suggested that regular face-to-face meetings may still be necessary even within a virtual team environment, thereby limiting the use of electronic communication to coordinate tasks such as scheduling activities, and sharing of results and documentation. This study challenges these previous findings and assesses the use of unified communication as an effective tool for leading virtual teams.

Leadership has been traditionally studied and implemented where team members were in close proximity to each other using face-to-face communication. With the increase in globalisation and advancement in information and communication technology, a new type of leadership was required for virtual teams as the traditional face-to-face communication was no longer practical. Leadership styles required adjustment to deal with the virtual team environment (Yoo & Alavi, 2004). The leadership styles suitable for a virtual team environment are discussed in later chapters.

1.3 Communication Defined

Before analysing unified communication, at a fundamental level, communication is about breaking down barriers. At a basic level, the telephone breaks distance and time barriers so that people can communicate anywhere in the world when they are not together. The trend in telecommunications is the migration of networks to voice over IP (Internet Protocol) which uses the internet for voice communication (Wang & Katz, 2001). A simplified communication model consists of the sender's message received unimpeded by the recipient (Cronje, Neuland, & Reenen, 1989).

Figure 1-1 A Simple communication model (Cronje, Neuland, & Reenen, 1989)



According to van der Smagt (2000), communication is either a two way monologue or a dialogue. In virtual teams, to ensure successful communication, dialogue should be the primary style of communication (van der Smagt, 2000). As communication in virtual teams is

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crucial for the success and effectiveness of these teams, communication tools and technology to replace two way monologues by dialogue are essential (van der Smagt, 2000). Electronic communication enable team members to link across time, distance, culture, departments, and organisations to create a mechanism where communication can take place at anytime and anyplace. Communication in virtual teams is expected to be swift, dynamic and greater in volume making it one of the significant contributors to successful virtual teams (Desanctis & Monge, 1998).

Technology comes with a number of benefits. However, with the advent of technology there are also a number of challenges to overcome (Oertig & Buergi, 2006). People use a variety of tools and devices to communicate, ranging from wireless phones, personal digital assistants, personal computers, laptop computers, thin client devices to slate devices. There are new forms of communication such as instant messaging, e-mail, social networking portals like Facebook and Twitter, professional networking sites like Linked-in, Skype and online chat sites. With so many devices and tools available, users have a range of communication options from which to choose. The number of different options makes integration of the various tools complex.

The concept of unified communications (UC) involves people using different modes of communication, different infrastructure, different tools, different media, and different devices to communicate to anyone, anywhere, at any time (Wang & Katz, 2001). It is quite common for a person to own and use a number of diverse communication devices, ranging from a mobile phone to a slate device (Aldea, Popescu, Draghici, & Draghici, 2012). This demand has created the need for unified communication which integrates the various communication mechanisms in a seamless fashion. Unified messaging focuses on allowing users to access voice, e-mail, fax, video and other mixed media independent of the access device (Wang & Katz, 2001).

The aim of this research paper is to ascertain whether the use of unified communication (UC) tools enable leaders to effectively manage virtual teams. Can unified communications completely replace face-to-face communications? Is unified communication an effective tool? Can organisations create virtual teams with confidence and expect the same results as traditional face-to-face teams. What type of leadership style will be effective when managing virtual teams?

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1.4 Scope of Research

The research was limited to Australia, Austria, Denmark, Egypt, El Salvador, England, France, Guatemala, India, Ireland, Japan, Kenya, Lebanon, Lithuania, Malaysia, Namibia, New Zealand, Nigeria, Pakistan, Panama, Poland, Portugal, Saudi Arabia, Singapore, Slovenia, South Africa, Sweden, Thailand, The Netherlands, Trinidad & Tobago, Turkey, United Arab Emirates, United Kingdom and the United States of America. These countries have been selected as they represent both developed and developing nations of the world. These countries have also been selected based on ease-of-access to leaders and virtual teams. Surveys were sent to a number of individuals, the majority of which, worked at a large multinational organisation. Additional surveys were sent to virtual team members who were active members on a virtual team blog, started by Michael Watkins, a Professor at Harvard University (Watkins, 2013).

1.5 Research Motivation

"If technology is the foundation of the virtual business relationship, communication is the cement." (Hulnick, 2000, p.33).

Communication in virtual teams has been found to be a major challenge (Grosse, 2002). Team conflicts due to misunderstanding and miscommunication are high, and cultural differences further amplify this challenge (Mogale & Sutherland, 2010). Furthermore, virtual teams often feel isolated from the organisation (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). Leaders are also required to trust virtual team members to manage and complete their tasks independently without much supervision (Mogale & Sutherland, 2010). The lack of face-to-face communication meant that the type of leadership for virtual teams needed to be different to that of traditional teams (Bergiel, Bergiel , & Balsmeier, 2008). Some team members have experienced that the response rate to urgent tasks are not always efficient as the virtual teams are not exposed to the urgency around each business requirement (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). These are just some of the challenges faced by virtual teams.

Virtual teams communicate and build relationships almost exclusively using information and communication technology tools. The use of these tools is vital for the success of virtual teams, compelling the organisations to often invest further in unified communication tools (Montoya, Massey, Hung, & Crisp, 2009).

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Robey, Khoo and Powers (2000) stated that face-to-face communication and meetings among virtual team members early in the project nurtures the ability to build close interpersonal relationships between the team members. These face-to-face meetings should focus on relationship building and strengthening cultural understanding to ensure long term, sustainable success on projects (Jarvenpaa & Leidner, 1998). When face-to-face meetings are not feasible, other techniques need to be considered to enable the team members to connect on a social level. Teams that engage in more social communication achieve higher trust and build improved social bonds and relationships amongst the team members (Sarker & Sahay, 2002).

According to Piccoli, Powell and Ives (2004), a number of communication challenges are faced by virtual teams ranging from time delays in sending feedback, lack of a common frame of reference, differences in interpretation and understanding of written text, and guarantee of team participation. Nonverbal communication such as body language or gestures are often missing from the communication in virtual teams, which often leads to misunderstanding or misinterpretation of the message communicated (Sproull & Kiesler, 1986).

Piccoli, Powell and Ives (2004) suggested that team discussions in virtual teams could be lengthy and confusing, leading to poorer understanding and comprehension of the topics discussed compared to traditional face-to-face discussions. According to Horwitz, Bravington and Silvis (2006), face-to-face teams performed better when compared to virtual computer-mediated teams. In virtual teams the use of e-mail, instant messaging, electronic video conferencing, telephone conferencing or voice-mail channels are used as a medium for communication but these tools offer only limited information and are not interactive.

The communication challenges faced by virtual teams range from the inability to interpret different accents and nonverbal cues, such as facial expressions, body language and gestures, to the lack of face-to-face interaction (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). “The written word can be harsher than the spoken word; even a critique needs to be phrased positively” (Horwitz, Bravington, & Silvis, 2006, p.472).

Tan, Wei, Huang and Guet-Ngoh (2000) stated that virtual teams initially tend to be less effective compare to traditional teams but this improves as virtual team members develop shared understanding over time. However, many business problems need to be addressed immediately so virtual teams may be ineffective at inception or at the initial stages of a project. Mogale, et al. (2009) supported these findings and added technological difficulties, communication amongst team members and trust as the key challenges when managing

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virtual teams. With the increase in the use of technology in virtual teams, non-verbal and visual cues impact the speed in which decisions are made by the virtual team members. Technology usage and the lack of face-to-face communication has been cited as the key factor why virtual teams take longer to make decisions and are less able to make inferences about the other team members. They are also less likely to anticipate responses from other team members (Martins, Gilson, & Maynard, 2004).

With the number of communication challenges and leadership challenges experience by virtual teams, it needs to be determined whether unified communication is a viable solution for effectively leading virtual teams. The ideal leadership style for virtual teams also needs to be determined. The remainder of this research paper aims to address these questions.

1.6 Layout and Structure of Research

This research paper consists of seven chapters. Chapter 1 introduced the research problem and provided a comprehensive background and introduction to virtual teams and unified communications. The relationship between the research problem and the research objectives were discussed and the motivation for undertaking the research paper was also explained.

Chapter 2 contains a detailed literature review that reveals various arguments in academic literature around virtual teams and unified communication. The literature review also discusses the challenges faced by virtual teams, the aspects that work well in virtual teams, the leadership styles effective for virtual teams, the differences between virtual teams and face-to-face teams, communication within virtual teams and mind-set changes required when operating in a virtual team environment.

Chapter 3 contains the research questions, and the remaining chapters' focus on answering the research question. Chapter 4 discusses the research methodology used, together with an explanation of the population and sample. The instruments used to collect the data are also defined and discussed. Chapter 5 comprises of the results of the data analysis. Tables, graphs and information from the survey responses are presented, thereby conveying a message from the data gathered. Chapter 6 contains a detailed analysis of the data with particular focus on answering the research questions.

The concluding Chapter 7 emphasises the significant findings from the research. It also provides recommendations from the research findings and provides exclusive recommendations for future research.

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CHAPTER 2: THEORY AND LITERATURE REVIEW

2.1 Introduction

Globalisation and advancement in information and communication technology has changed the competitive landscape for businesses. Businesses compete for the same customer base irrespective of their geographical location. Access to global resources provide added benefits to organisations as the best skilled resources are accessed anywhere in the world regardless of their location. This change in the business landscape has led to the creation of virtual teams (Yoo & Alavi, 2004).

Virtual teams however, are quite different to traditional face-to-face teams in aspects such as communication and reliance on information and communication technology (Lipnack & Stamps, 1999). Communication challenges was also highlighted as a major challenge in virtual teams in the literature review that follows. With this as the background, the use of unified communication is explored as a tool to overcome the challenges faced by virtual teams.

As virtual teams require a 'new-breed' of leadership, the leadership styles for leading and managing virtual teams are different to that of traditional face-to-face teams. Effective leaders in virtual teams are known to create a beneficial environment where socialisation amongst the virtual team members is encouraged through regular chat sessions (Kayworth & Leidner, 2002). With this as the background, the use of unified communication is explored as a tool to enable effective leadership virtual teams.

This chapter contains a detailed literature review that presents the various arguments in academic literature regarding virtual teams and unified communication. The academic literature referenced is fairly recent, using authors who are considered experts in the field of virtual teams and globally dispersed teams. The literature review elaborates on globalisation and its impact on the formation of virtual teams, the challenges faced by virtual teams, the aspects that work well in virtual teams, the various leadership styles for virtual teams, the differences between virtual teams and face-to-face teams, communication within virtual teams and mind-set changes that are required when operating in a virtual team environment. The purpose of this chapter is to review and refine the research problem statement, thereby demonstrating the need for this research.

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2.2 Globalisation and its impact on virtual teams

Globalisation is defined as a process which lessens the need for international boundaries. Modern communication technology, from telephone, radio, television and the internet make it possible for people to connect and interact with each other despite the large geographical distances between them (Crane & Matten, 2010). Yoo and Alavi (2004) stated that globalisation and advancement in information and communication technologies are stimulating a move towards new organisational structures such as virtual teams. The changing face of the business environment with technological changes, and increased global competition have forced businesses to distribute their products more widely and adapt to these changes to remain competitive (Hough, Neuland, & Bothma, 2003).

Many organisations are designing and implementing more flexible structures to meet the demands of the fast-changing marketplace. This restructuring is in response to global mergers and acquisitions, competition, globalisation and corporate layoffs (Lurey & Raisinghani, 2001). In order to remain competitive, businesses need to achieve their goals and objectives using speed, lower cost, higher quality and faster response times. However, traditional organisational structures cannot always accomplish these objectives. This led to the creation of virtual teams where team members can be geographically dispersed and no longer need to be co-located or work face-to face to function as a team (Lurey & Raisinghani, 2001).

Every country has varying quantities and forms of resources each with their own cost structures. This results in similar resources around the globe but with different cost structures. Because of these differences, some countries may have a comparative cost benefit over another country. This fundamental principle led to the creation of virtual teams as it enables organisations to utilise resources from any part of the globe and create products and services in a cost effective manner (Hough, Neuland, & Bothma, 2003).

2.3 Virtual Team Defined

“A team is a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems, and who manage their relationship across organisational boundaries” (Cohen & Bailey, 1997, p. 241).

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Virtual teams have many definitions listed in various academic journals. Even though these definitions vary, there are overlapping and common overarching themes throughout these different definitions.

According to Merroll, Sayeed and Hightower (1997) virtual teams are defined as geographically distributed knowledge workers who collaborate on a variety of workplace tasks. Hayward (2002) further defined virtual teams as groups of individuals who collaborate on the execution of a specific project while located at multiple sites. Townsend, DeMarie and Hendrickson (1998) expressed virtual teams as "groups of geographically and/or organisationally dispersed co-workers that are assembled using a combination of telecommunications and information technologies to accomplish and organise tasks. Virtual teams are groups of temporally dispersed individuals brought together via information and telecommunication technologies". Virtual teams are further defined as "groups of geographically and/or organisationally dispersed co-workers that are brought together by information and telecommunication technologies to accomplish one or more organisational tasks" (Desanctis & Monge, 1998; Jarvenpaa & Leidner, 1998; Yoo & Alavi, 2004).

Virtual teams have emerged due to the advancement in communication technologies (Matlala, 2011). With virtual teams, resources can be based anywhere in the world and these resources collaborate to deliver on agreed commitments to the organisation. Organisations can now hire the best resources regardless of their location in the world.

Virtual teams could range from employees working from their homes to small groups or teams in offices all around the world. The growth of globalisation, advancement of technology and increase in outsourcing globally may mean that virtual teams will become the norm in the way business is done (Lurey & Raisinghani, 2001). According to Lipnack and Stamps (1999), virtual teams have been recognised as an effective way to organise resources for flexible and cost effective operations. Lipnack and Stamps (1999) further stated that with the recent advances in technology, team members no longer need to be based in the same location but could use technology across distance, time zones and boundaries of the organisation.

Virtual teams are reconfigurable, meaning that their boundaries are blurred; their relationships are more contractual than traditional teams. In as much, there is greater switching of tasks, roles and work assignments allowing work to be dynamically allocated across borders, depending on the workload (Desanctis & Monge, 1998). Benefits derived from the use of virtual teams range from access to less expensive labour resources, reduced office space, greater utilisation of resources, larger pool of available resources, greater access to technical

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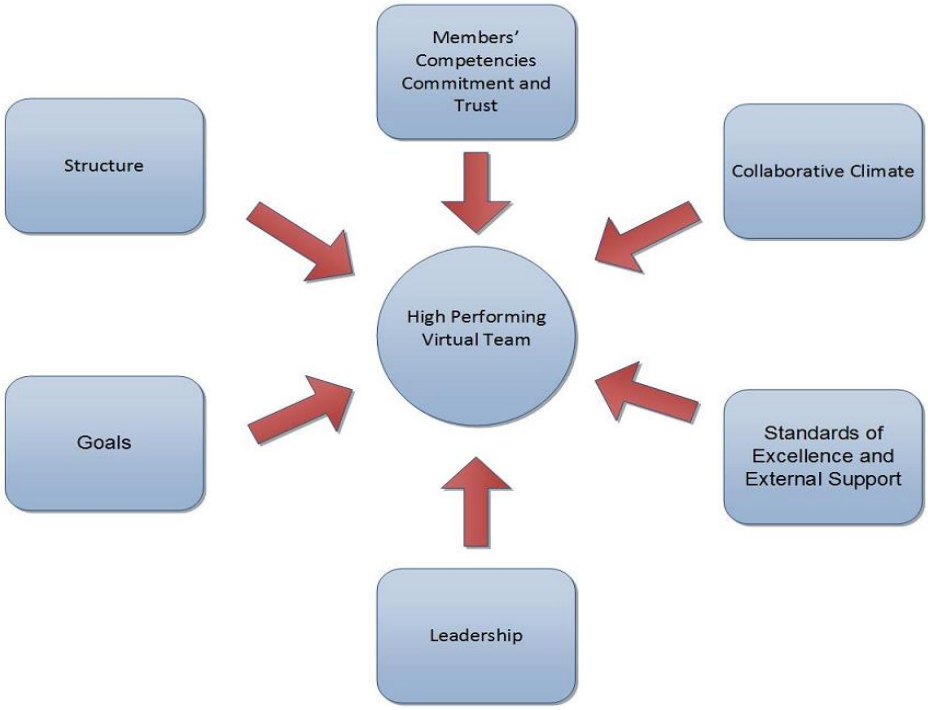
resources, to most importantly, the different time zones provide access to a continuous and consistently available workforce.

The most common themes noted across the various definitions of virtual teams include geography, time zones, location and organisational boundaries (Martins, Gilson, & Maynard, 2004). Contrasted to traditional teams, virtual teams are not constrained to one location as the virtual team members could physically be located anywhere in the world (Martins, Gilson, & Maynard, 2004).

There are a number of varying definitions of virtual teams. For the purpose of this study, the definition by Piccoli, Powel and Ives (2004) is used. Virtual teams are defined as *"geographically dispersed teams who work together across time and space using information and communication technologies to accomplish one or more organisational tasks"* (Piccoli, Powel and Ives, 2004, p.359).

2.4 Elements of a High Performing Virtual Team

Figure 2-1 Elements of a high-performing virtual team (Aldea, Popescu, Draghici, & Draghici, 2012)



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The fundamental elements making up a high performing virtual team (Figure 2.1) comprises of team goals, structure, member competencies, collaboration climate, standards of excellence and leadership style. As virtual teams are typically based in different locations all over the world, their goals need to be clear, concise and unambiguous to ensure that every team member works towards the same objective (Oertig & Buergi, 2006).

Virtual team structural characteristics include team composition, organisation of the team, tools and processes, communication systems and the facilities available in the organisation. As virtual teams could potentially be globally dispersed, it is vital for all roles, responsibilities and accountabilities to be clear. Processes to coordinate the various activities including scheduling of activities, communication of deadlines, coordination of efforts, assignment of responsibilities and feedback on individual performance is vital for the success of the virtual team (Grosse, 2002).

In virtual teams, the level of competency of each team member is crucial for the success of the entire team. Their technical skills, knowledge, abilities, attitude, drive, passion and their ability to collaborate, communicate and contribute to the larger team is vital. Furthermore, team members need to have strong interpersonal skills, and have a high level of comfort with technology (Aldea, Popescu, Draghici, & Draghici, 2012). Mediocrity is not an option and only the best skills should be hired for virtual teams (Bartlett, 2001).

Another basic element for the success of a high performing virtual team is the ability of its leader to create an environment open to collaboration, trust and reliability. In traditional organisation structures, trust is earned by constant face-to-face interaction between the various stakeholders. As virtual teams by nature involve very little face-to-face interaction, team members must rely on technology and communication tools to achieve the same result (Oertig & Buergi, 2006).

Support structures must be in place to ensure that virtual teams have the necessary infrastructure, tools and processes to effectively perform their duties (Grosse, 2002). In summary, for a virtual team to be considered as a high performing team, a few fundamental elements must be in place. The literature review related to these basic elements correlates to the findings of this research, which is discussed in later chapters.

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2.5 Virtual Teams versus Face-to-Face Teams

Virtual teams differ from traditional face-to-face teams in aspects such as communication, the number of team-member relationships and the ability to work in a global context (Lipnack & Stamps, 1999). Luse, McElroy, Townsend and DeMarie (2013) stated that virtual teams differ from face-to-face teams where the virtual teams are physically separated from one another and rely on technological devices for communication and exchange of information. However, even though technology provides great ways for virtual teams to communicate, it is inadequate to completely replace face-to-face communication (Desanctis & Monge, 1998). These conflicting views will be further discussed in later chapters.

Contrasted to traditional teams, virtual teams are not constrained to one location as the virtual team members could physically be located anywhere in the world (Martins, Gilson, & Maynard, 2004). With the technological advances available today, team members can work together from any distance as though they were sitting next door to one another in a typical office setting (Lipnack & Stamps, 1999).

According to Lipnack and Stamps (1999), successful virtual teams depend more on people than they do on technology. The best technologies will not work unless people issues are addressed first (Lipnack & Stamps, 1999). Even though this statement seems obvious, virtual teams consist of global resources with different cultures and languages who potentially work in different time zones. Appreciating and understanding these differences is vital for the success of a virtual team.

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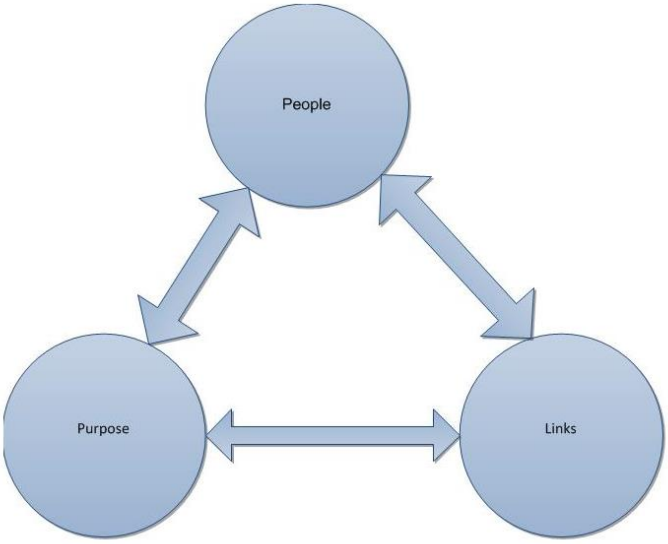
Figure 2-2 Virtual Team Model (Lipnack & Stamps, 1999)



Lipnack and Stamps (1999) suggested a model for virtual teams that comprises of three components, namely people, purpose and links. This model suggests that people are the core component of virtual teams. The type of person in a virtual team is crucial to the success of the team. Virtual team members must be autonomous, self-reliant, independent yet interdependent. This means that they must be able to work alone yet understand the bigger picture and work with other team members to achieve the overall success of the virtual team (Lipnack & Stamps, 1999). The second component of the model relates to purpose. Virtual teams must have a purpose that can be easily translated into actions. The third component of the model is known as links. These links do not just refer to the connections or technology but also refer to face-to-face conversations or communication technologies (Lipnack & Stamps, 1999).

In contrast, Martins, Gilson and Maynard (2004) suggested that researches are shifting away from defining virtual teams as different to traditional or face-to-face teams, and are instead focusing on the virtual nature as a characteristic of all teams. In traditional face-to-face teams, team members are more inclined to look within their known networks for additional team members. This could include their affiliations with other teams, departments, organisations and cultural groups. Martins, Gilson and Maynard (2004) stated that in virtual teams, members are selected based on 'what they know' rather than 'who they know'. Piccoli, Powel and Ives (2004) stated that virtual teams tend to be more task focused and less social-focused than traditional face-to-face teams. Luse, McElroy, Townsend and DeMarie (2013) stated that the unique and specialised skill one brings to a team is a more important for a virtual team than

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for a traditional team. These characteristics show that virtual teams are not that different to traditional face-to-face teams as the aspects that are important to the success of traditional teams are also important for virtual teams.

Luse, McElroy, Townsend and DeMarie (2013) stated that the experience and skills one brings to a team are more important selection criteria for virtual teams than for traditional face-to-face teams. Personal characteristics such as race, gender, attractiveness and attitudinal similarity influence the selection process for face-to-face teams. However, for virtual teams, the ability to provide the skills required is what matters most.

When comparing face-to-face teams with virtual teams around conflict management, Martins, Gilson & Maynard (2004) stated that conflicts are more likely to occur in virtual teams. However, when virtual team members have a perception of a common group identity, the amount of conflict is substantially reduced (Martins, Gilson, & Maynard, 2004). Traditional face-to-face teams have a higher level of team cohesion than virtual teams. However, while virtual teams begin with lower team cohesion, over time this changes and matures into strong team cohesion due to the regular interaction and exchange of information between the team members (Lind, 1999).

The lack of face-to-face contact has been reported as one of the main challenges when managing virtual teams (Oertig & Buergi, 2006). Piccoli, Powel and Ives (2004) suggested that regular face-to-face meetings may still be necessary, even in a virtual team environment, limiting the use of electronic communication to activities such as documentation, scheduling activities and sharing of results.

This section emphasised the key similarities and differences between virtual teams and traditional face-to-face teams. The majority of the authors referenced in this section of the literature review agree that effective communication tools are vital for the success of virtual teams however Desanctis and Monge (1998) state that these tools provide great ways for virtual teams to communicate, but is inadequate to completely replace face-to-face communication.

2.6 Advantages and Enablers of Virtual Teams

Virtual teams are often known for their flexible membership as specific skills and roles can be added or changed as the need arises within the project (Martins, Gilson, & Maynard, 2004). Since virtual teams have specialised skills and virtual team members are known to work

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independently, these teams are often used to address complex projects of significant importance (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). These teams are often assembled for a specific purpose in response to a business need and are typically short lived. In addition, the specification of a clear team structure, establishing shared norms and regular team building exercises contribute to the success of virtual teams (Piccoli, Powell, & Ives, 2004).

Companies support the creation of virtual teams as it produces business benefits that include access to global skills, reduced workspace costs, increased productivity, availabity of resources across time-zones, new ways of enhancing customer service, better access to global markets and environmental benefits (Merroll E, Sayeed, & Hightower, 1997). Many studies have highlighted the factors that contribute to a successful virtual team. These include effective team building (Piccoli, Powell, & Ives, 2004), team cohesiveness (Maznevski & Chudoba, 2000), effective communication techniques (Robey, Khoo, & Powers, 2000), the use of appropriate technology (Yoo & Alavi, 2004) and conflict management (Suda, 2013).

Due to the nature of virtual teams, these teams enable organisations to be flexible and adaptive, allowing organisations to respond quickly and efficiently to competitive pressure. The communication and technologies virtual teams require provide added advantages to the organisation. Virtual team members can work in parallel rather than sequentially thus speeding up project completion (Suchan & Hayzak, 2001).

On 10th June 2013, Professor Michael Watkins from Harvard University initiated a blog on virtual teams questioning the aspects that make a virtual team successful and the typical challenges experienced in a virtual team (Watkins, 2013). The details from his findings are documented in later chapters in this research paper. However, in summary, he listed the following themes as vital components to successful virtual teams: the need for face to face communication as a strategic success factor; clearly defined roles, responsibilities, tasks, processes and goals; an agreed communication charter; use of the best communication technologies; building a consistent and regular rhythm with the virtual team; agreement on a common language to ensure that no misinterpretations occur; creation of an environment conducive to sharing information; clarification and tracking of progress on team and individual commitments and the creation of a leadership culture based on trust are the most vital building blocks to a successful virtual team.

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The advantages highlighted by the authors that were reviewed in this section were compared to the feedback from responses received from the virtual team survey. The similarities and differences are evaluated and discussed in later chapters.

2.7 Challenges with Virtual Teams

While virtual teams provide numerous benefits, virtual teams also have several challenges to contend with (Piccoli, Powell, & Ives, 2004). Some organisations have projects spanning across multiple nationalities, across geographical distances and different time zones. The lack of face-to-face contact has been reported as one of the main challenges when managing virtual teams (Oertig & Buergi, 2006). Piccoli, Powel and Ives (2004) suggested that regular face-to-face meetings may still be necessary even within a virtual team environment, thereby limiting the use of electronic communication to tasks such as administration activities, documentation, scheduling activities and sharing of results.

Other challenges listed were related to cultural and language barriers, communication and technological challenges, time-zone differences and the need for effective leadership when managing virtual teams (Oertig & Buergi, 2006). A summary of challenges faced by virtual teams is provided in Appendix-D. Piccoli, Powel and Ives (2004) stated that cultural and language barriers are common in virtual teams and this leads to communication and coordination difficulties. This cultural barrier can be mitigated when there is a conscious effort to understand, accept and appreciate cultural differences.

When global virtual teams are composed of diverse members with different ethnic, national, as well as organizational backgrounds, they tend to filter information based on their regional and cultural backgrounds. These differences in culture could result in a potentially broad range of misinterpretations or distortions in communication (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). Piccoli, Powel and Ives (2004) stated that the degree in which virtual teams engage in socialisation is directly related to the cultural inclinations and preferences of the team members.

As virtual teams are geographically dispersed, the teams may consist of resources from different continents, regions, religion, culture and language. As English may not be the home language for these diverse team members, their competence in the language may impact the levels of communication between the virtual team members.

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Another challenge facing virtual teams is their ability to work collaboratively and interactively without physically meeting each other (Hayward, 2002). The ability to work across time zones is also a challenge as meetings scheduled by one team member may not be suitable or convenient for another. This delay in the ability of team members to contact each other could increase the time taken to reach consensus or agreement on business issues (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002).

These delays may also impact the team and the deliverables expected from the team when they cannot proceed without an answer from a colleague. Technology can aid in this respect but it does not alleviate the inability to communicate face-to-face (Horwitz, Bravington, & Silvis, 2006). Managing these teams from a distance is also difficult because managers need to build trust and improve productivity whilst minimising conflict between team members.

The lack of common understanding and shared knowledge at inception of a project tend to hamper team communication in virtual teams. With team members distributed across the globe, some members assume that others are communicating and sharing information which may not be the case (Piccoli, Powell, & Ives, 2004).

With technology as their primary method to keep in touch, the effectiveness of virtual teams is hampered by any technology limitations. Hardware reliability, software ease of use, incorrect software configuration, network stability, incorrect email addresses or bandwidth constraints negatively impact virtual teams (Piccoli, Powell, & Ives, 2004). These technology challenges can significantly impact the success of a project when team members have technology as their primary means of communication (Kayworth & Leidner, 2002). However, technological support and collaboration across distributed teams which was once a challenge for virtual teams is now readily accessible with virtual support teams available across the globe (Piccoli, Powell, & Ives, 2004).

Leadership in any team is important but in virtual teams this competency is even more relevant. Given the diverse social environment and background in virtual teams, leaders must be able to build and maintain an environment necessary for ensuring team congruence, harmony and cohesiveness whilst focusing on effective delivery (Yoo & Alavi, 2004).

Management styles and techniques for managing virtual teams differ from the styles and techniques used in managing traditional teams. With virtual teams, managers do not always know what their team members are working on. This makes performance evaluation complex as a level of trust needs to exist between the team and their manager (Horwitz, Bravington, &

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Silvis, 2006). Due to the complex and ambiguous nature of work in virtual teams, it is difficult to coach, assess and provide feedback to team members. Managers must be able to manage teams, build trust, efficiently measure productivity and performance, assess the team's strengths and weaknesses, assess rewards and recognition for each team member, manage conflicts, manage and coordinate main activities all whilst having limited face-to-face interaction (Merroll E, Sayeed, & Hightower, 1997).

Table 2-1: Summary of Challenges for Virtual Teams (Kayworth & Leidner, 2002)

Type of Challenge	Description
Communication	• Traditional social mechanisms are lost or distorted. • Communication dynamics such as facial expressions, vocal inflections, verbal cues and gestures are altered. • Distinctions among member's social and expert status are lost or distorted. Inhibition in building trust. • Communication process dysfunction.
Culture	• Potential for multiple cultures require greater communication skills • Unrealistic cultural expectations • Communication may be distorted through cultural misunderstanding or biases.
Logistics	• Multiple time zones making scheduling meetings and travelling very difficult.
Technology	• Technophobia

The table above summarises the main challenges discussed in the literature review into four major themes, namely communication challenges, culture challenges, logistical challenges and technological challenges. The data analysis in Chapter 5 delves into the challenges faced by virtual teams as highlighted by the participants of the virtual team survey instrument used for this research.

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2.8 Overview of Unified Communications

Many organisations use different tools such as e-mail, instant messaging, IM presence, conference calls, voice calls and video calls. The concept around unified communications is the integration of data, voice and video into a single product.

Most information technology users have a number of heterogeneous communication devices such as mobile phones, pagers, personal digital assistant (PDA), laptop computers, personal computers, slate devices as well as a variety of applications such as e-mail, instant messaging or chat-rooms. The concept behind unified communication is to integrate the various communication mechanisms in a meaningful manner so that its users are constantly connected (Wang & Katz, 2001).

A unified collaboration system enables users to integrate all their messages and communication through a single service that can be accessed by several devices (Wang & Katz, 2001). A user can monitor and reply to e-mail from a cell phone, make and receive telephone calls from a laptop computer from any area with a wireless network, participate in video conference calls from anywhere in the world using a range of electronic devices and send and receive text messages using Instant Messaging functionality from a slate device.

Figure 2-3 Unified Communication

Source (http://www.techprognosis.com/unified-communications)

Unified communication systems must be user friendly as the success is largely dependent on the usability and ease of use. People with various skill levels including those that are not fluent in technology trends use unified communication. Communication products and tools have

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been developed to improve communication but it has also been developed to improve the efficiencies of virtual teams (Aldea, Popescu, Draghici, & Draghici, 2012). Virtual teams rely heavily on web-based technologies and web-based information systems as these technologies enable collaboration and substitute the need for face-to-face communication.

Video and audio functionalities are powerful tools of unified collaboration. The ability for virtual team members to speak, listen and see other team members who may be located in different regions around the globe creates a sense of belonging amongst team members (Aldea, Popescu, Draghici, & Draghici, 2012).

The ability to record conference calls and virtual meetings allows team members to replay the recording and better understand or clarify any points from the communication session. Virtual team managers may be based in different countries with different time zones. Therefore, it may not always be feasible to contact the virtual manager. These recordings play an important role in answering questions that team members may have.

Some countries around the globe may have bandwidth constraints and video conference calls may not always be possible. Instant messaging allows team members to chat using text based messages. If a team member has a quick question or requires clarity, a simple 'Instant Message' to another virtual team member may be a powerful tool that works in partnership for maximum communication clarity.

Modern unified collaboration tools allow users to share information in real time. A team member could be based in one continent and deliver a slide presentation that could be viewed by members all over the globe (Aldea, Popescu, Draghici, & Draghici, 2012). Furthermore, a team member based anywhere in the world could take control of the presenter's machine to continue the presentation (Aldea, Popescu, Draghici, & Draghici, 2012). These aspects of unified communication simulate face-to-face meetings, breaking the distance barrier within virtual teams. The effectiveness of the simulation of face-to-face meetings remains to be ascertained.

The use of these products to improve the effectiveness of managing virtual teams was analysed as part of this research. There are many components that constitute a unified communication suite, but this research aims to determine if all the components of a unified communication suite are vital for leading the virtual team. The results from this analysis are revealed in subsequent chapters of this research.

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2.9 Technology and Unified Communication in Virtual Teams

The distinguishing features of a virtual team is its reliance on communication technology and information technology (IT) to communicate with each other, its flexible nature and its ability to traverse across time zones and organisational boundaries (Piccoli, Powell, & Ives, 2004). According to Aldea, Popescu, Draghici and Draghici (2012), information and communication technology has been recognised as a vital component for the effectiveness of a virtual team.

Virtual teams use a variety of information and communication tools and technologies to support team collaboration including chat, video-conferencing, email, group support systems, instant messaging and collaboration forums. In recent years more communication takes place without being face-to-face than ever before (Rutkowski, Vogel, van Genuchten, & Saunders, 2008).

Organisations today seek rapid responses and feedback to customer needs; flexibility as those needs change and resources with the correct skills to address those needs. These organisations require structures that support communication that promote speed, customer responsiveness and flexibility to address the customer needs and to remain competitive. To achieve this, many organisations have turned to virtual teams to provide remote support to their customer base. These organisations have used technology and advances in telecommunication to transition to the use of virtual teams (Suchan & Hayzak, 2001).

Virtual team reliance on integrated communication and collaboration tools make these teams unique (Suchan & Hayzak, 2001). The degree of technology used in virtual teams is different to that of traditional face-to-face teams. However, it is considered that as long as the majority of interaction within the team occurs electronically, the team is then regarded as a virtual team. The proportion of electronic communication that is sufficient to be regarded as a virtual team still remains unclear (Martins, Gilson, & Maynard, 2004). The greater use of technology by virtual teams means that communication cues and non-verbal cues are often missed during information exchange (Sayeed & McHaney, 1998).

There are a variety of technologies to supplement or replace traditional or face-to-face interaction. These technologies differ in their ease of use, richness, cost, speed and the extent to which they enable synchronous collaboration (Martins, Gilson, & Maynard, 2004). The choice of technology in virtual teams varies, based on the preferences of the team members. These preferences are typically based on ease-of-use, the need for documentation or the tools that best suit the communication channel (Robey, Khoo, & Powers, 2000). Virtual team

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members typically use a variety of technologies to match the communication requirements of the task at hand. When new technologies are introduced, it is found that virtual teams need time to adapt but have ultimately adapted satisfactorily (Maznevski & Chudoba, 2000). Maznevski and Chudoba (2000) stated that effective virtual teams are also able to adapt the technology used to match the team structure.

Modern virtual teams use a range of information technology products and platforms, hardware and software products and are linked by the internet, intranet and extranet. This allows the virtual team members to acquire, share, transfer, integrate and use information in collaborative way (Aldea, Popescu, Draghici, & Draghici, 2012). Virtual collaboration refers to the ability for team members to share and integrate knowledge and information through virtual media. This collaboration can benefit organisations as it incorporates participation and involvement from a broad range of virtual team members from remote locations (Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007). Virtual collaboration also creates the opportunity to bring skills together from remote parts of the organisation for short period of time that would otherwise not have had the opportunity to engage in discussions together. These global skills have the potential to create enhanced benefits for the organisation as a whole (Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007).

Modern web-based internet technologies have been developed over the recent years to not only support the ease of communication within virtual teams but also work processes where distributed functionality is needed to support virtual or distributed teams (Aldea, Popescu, Draghici, & Draghici, 2012). According to Aldea, Popescu, Draghici and Draghici (2012), the main functionalities required by virtual teams to effectively collaborate and communicate include sound and audio functionalities, video functionalities, video streaming, instant messaging, display or whiteboard functionality and application sharing functionality.

Sound functionality includes the ability for virtual team members to speak, hear and see one another. This is probably the most used option and helps to create trust and confidence amongst team members (Aldea, Popescu, Draghici, & Draghici, 2012).

Video streaming functionality allows team members to record a meeting or discussion which can be replayed at any time. This is particularly useful in a virtual team environment where team members can replay a meeting recording for clarification. As virtual teams are dispersed and resources may not always be available due to time zone differences, video streaming and replay of recorded sessions are useful to provide clarity to any discussion or topic needing additional clarification (Aldea, Popescu, Draghici, & Draghici, 2012).

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Instant Messaging functionality allows virtual team members to send text messages to one another or to specified groups. This allows for quick discussions or clarification on any aspects without engaging in lengthy e-mail communication (Aldea, Popescu, Draghici, & Draghici, 2012). An example of instant messaging functionality is provided in Appendix B.

Display or whiteboard functionality allows virtual team members to share diagrams, images, spread sheets or any visual image with other team members or with the virtual team or group as a whole (Aldea, Popescu, Draghici, & Draghici, 2012). Some unified collaboration tools allow for desktop sharing which enables team members to share their desktop screens so that all team members, irrespective of their location, can view the screen image.

Application sharing allows an application that is running on one team member's computer to be viewed by all other team members in real time. A participant in a virtual team meeting can 'take control' of the presenter's computer to handle remote content (Aldea, Popescu, Draghici, & Draghici, 2012).

Virtual teams today use complex software tools to create a collaborative working environment. Aldea, Popsecu, Draghici and Draghici (2012) stated that organisations using virtual teams must empower their teams with the best tools and must ensure that conference calls are aided by white board sharing and web tools to create an effective and collaborative virtual environment.

Organisations can gain competitive advantage by harnessing the power of virtual teams using the right collaboration and communication technologies. The literature review and analysis in this section confirms the competitive advantages that organisations have when using a unified communication suite including sound and audio functionalities, video functionalities, video streaming, instant messaging, display or whiteboard functionality and application sharing functionality.

2.10 Global mind-set in Virtual Teams

According to Beechler and Baltzley (2008), companies that have a global mind-set will have a competitive advantage in the global market. Gregersen, Morrison and Black (1998) suggested that international projects and assignments, working in international teams, international training and formal education, diverse locations for team meetings and having a deep understanding and respect for foreign cultures are methods to develop a global mind-set.

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Team members from different cultures have different styles and behaviours in their communication patterns. One of the major dimensions of cultural variability is individualism versus collectivism (Hofstede, 2001). According to Hofstede (2001), in individualistic cultures, the needs, values and goals of the individual take precedence over the needs, values and goals of the group. In collectivist cultures, the needs, values and goals of the group takes precedence over the individuals' needs, value and goals. When working with virtual teams, it is essential to develop intercultural sensitivity to understand the cultural temperament of the team. Appreciating the inherent culture of the various team members enables the leaders to maximise the output of these teams (Hambley, O'Neill, & Kline, 2007).

According to Jarvenpaa and Leidner (1998), individuals from individualistic cultures are less focused on group membership, have greater skills in joining and leaving new groups and engage in more open and clear communication. These team members also have a better ability to respond to ambiguous messages than individuals from collectivist cultures.

Grosse (2002) suggested that when virtual team leaders communicate across cultures, they need to do the following:

- show intercultural sensitivity,
- build trust and understanding amongst the virtual team members,
- understand how diversity strengthens the virtual team,
- develop a network of good relationships,
- overcome communication barriers,
- show respect for other languages and cultures and
- understand the advantages and limitations of technology for any given situation.

The data analysis in subsequent chapters supports the literature review in this section. For virtual teams to be effective, team members must develop a global mind-set. The crucial element to developing a global mind-set is the ability of virtual team members to learn, respect, understand and appreciate diverse cultures. The detailed data analysis related to global mind-set is discussed in subsequent chapters.

2.11 Team Dynamics and Trust in Virtual Teams

According to Martins, Gilson and Maynard (2004), virtual teams are regarded as teams first, with the cybernetic nature of the team merely regarded as a characteristic. Suda (2013) stated

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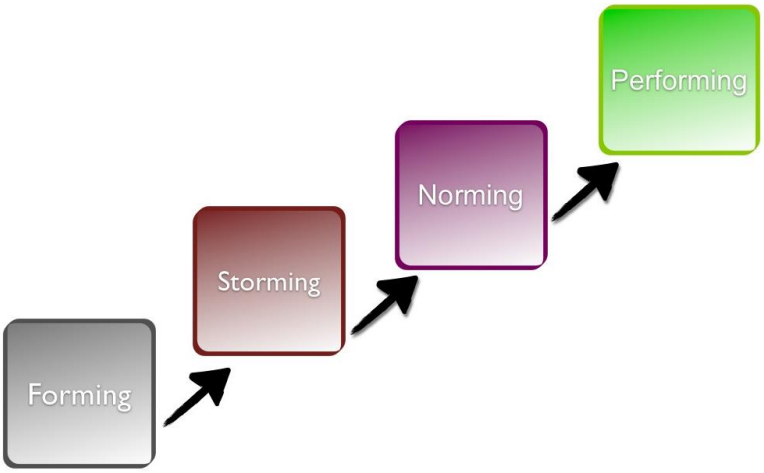
that the greatest challenge virtual teams faced related to 'leadership and direction setting', 'communication and information sharing' and 'coaching and development'. These three areas were identified as key challenges based on research performed on over 200 virtual project leaders responsible for leading complex international projects. In addition, 'social dynamics' was also listed as one of the most challenging areas.

Social dynamics refers to the challenges faced when brainstorming ideas, problem solving during complex projects, physical separation from other team members, cultural understanding and dynamics and the limitations of technology when dealing with complex situations which makes it difficult for team members to speak their minds openly and freely (Suda, 2013). Piccoli, Powel and Ives (2004) stated that virtual teams face difficulty in building strong relationships, cohesion and trust which is a fundamental building block for a successful and effective team.

Figure 2-4 Tuckman Model (Tuckman & Jensen, 1977)



The Tuckman Model postulated that a team progresses through the various phases of forming, norming, storming and performing, thereafter leading to better communication, decision making and performance amongst the team members (Tuckman & Jensen, 1977). According to Suda (2013), this model has severe limitations in a virtual team environment. Suda (2013) elaborated that the Tuckman Model is not sufficiently dynamic when applied to complex virtual teams as these teams are challenged by multicultural issues. Virtual team members must be skilled and experienced enough to deal with these dynamics. Suda (2013) suggested a model that provides a list of social stages for virtual teams. A summarised list of key challenges in virtual teams is provided in Appendix-D.

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One of the major challenges faced by virtual teams is the complexity around knowledge transfer, especially since team members are all part of a dynamic global environment with each team member holding some key knowledge (Suda, 2013). To overcome this challenge, Suda (2013) recommended the use of simulation techniques. Simulation provides an ideal context for individuals and teams to share virtual team learning experiences and deal with real life conflicts and challenges that would typically be encountered in a virtual team environment. Team members can directly experience the emotional tension and the social and cultural issues typically encountered in a virtual team environment (Suda, 2013).

Trust is another crucial success factor in virtual teams. A team member trusts the team and the leadership when the group behaves in accordance with any implicit or explicit commitments made, is honest in all negotiations preceding such commitments and does not take excessive advantage of one another when an opportunity arises (Jarvenpaa & Leidner, 1998).

Another factor that promotes trust in virtual teams is the anticipation of future association. This anticipation of future association where the team members have the opportunity to work together on other engagements is higher among co-located group members than amongst virtual dispersed teams (Piccoli, Powell, & Ives, 2004). According to Jarvenpaa and Leidner (1998), face-to-face meetings are considered irreplaceable for both building trust and repairing shattered trust.

Trust in any team is vital but in virtual teams, with team members dispersed across the globe, trust is absolutely crucial as it is built and maintained via electronic communication. The data analysis in subsequent chapters supports the findings of the literature review in this section, confirming that the correct team dynamics and trust elements are crucial components of a successful virtual team.

2.12 Leadership in Virtual Teams

Yukl (1998) defined leadership as "*influence exerted over other people to guide, structure, and facilitate relationships in a group*". Leadership is a vital element to effective virtual teams as leaders can make a critical impact to a team's success and effectiveness (Morgeson, 2005). Effective leaders in virtual teams are known to create a beneficial environment where socialisation amongst the virtual team members is encouraged through regular chat sessions (Kayworth & Leidner, 2002). Luse, McElroy, Townsend and DeMarie (2013) suggested that

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personality and cognitive styles of individuals and leaders are crucial factors to the success of virtual teams. Virtual teams are different to traditional teams so the leaders that oversee these teams are also different (Hambley, O'Neill, & Kline, 2007). This new breed of leadership is referred to as 'e-leadership' or 'virtual leadership.

Hambley, O'Neill and Kline (2007) stated that there are a number of theoretical approaches to leadership but the well-known or popular framework is the transformational style of leadership. Leadership challenges are amplified in a virtual environment due to the lack of face-to-face interaction (Bal & Theo, 2000). It is essential for leaders to develop strong relationships with team members before commencing a virtual working relationship. This is important for building the foundation of trust that serves to promote creativity, motivation, morale, good decisions, and fewer process losses (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). Leaders in virtual teams need to discuss cultural similarities and differences to establish a benchmark for communication.

A number of theories exist that define effective leadership. These theories are grouped into three categories, namely Trait Theory, Behavioural Theory and Contingency theory (Yoo & Alavi, 2004). It is vital to distinguish between these different theories and understand the ideal leadership behaviour and style suitable for virtual teams.

Trait theory postulates that effective leaders possess some inherent characteristics such as social maturity, passion, motivation, emotional intelligence and strong human relations. This theory further elaborates that such leaders are "born, not made" (Kayworth & Leidner, 2002). However, trait theories have failed to differentiate between effective and ineffective leaders (Yoo & Alavi, 2004).

Behavioural leadership focuses on the behaviour and actions rather than the inherent characteristics of the leader. This leadership style can be measured by the actual observable activities performed by the leader (Kayworth & Leidner, 2002). The flaw with this leadership style is that it fails to take the context of the environment into account when evaluating a leader. An autocratic leader may work well in a military environment by may fail dismally in a corporate environment (Yoo & Alavi, 2004). However, behavioural theories have failed to identify a flawless relationship between various leader behaviours and leadership effectiveness (Yoo & Alavi, 2004) .

The contingency style of leadership postulates that leadership style needs to vary, based on individual situations. The effectiveness of a leader will depend on his/her ability to adapt to a

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particular situation (Kayworth & Leidner, 2002). The leader must be able to deal with ambiguous situations and adjust leadership styles based on the particular situation.

Subordinates also recognise leaders who can adjust their leadership style as more effective leaders. Effective virtual leadership will result in highly satisfied teams, which ultimately leads to more effective results (Kayworth & Leidner, 2002).

2.12.1 Transformational Leadership

Transformational leaders provide a new direction of thinking, strategizing and providing a fresh sense of inspiration and behaviour. Transformational leaders keep the long term vision of the company in mind and ensure that there is mutual alignment between the organisation's interests and their own. A basic characteristic of a transformational leader is the focus of winning the respect of the team. This creates a symbiotic relationship whereby both leader and follower inspire each other to reach organisational goals. A transformational leader listens attentively and gives the follower complete attention, even if there are opposing views. This focus appeals to the follower because the follower appreciates the attention and feels that he/she is being heard (Bass, Avolio, Jung, & Berson, 2003).

Transformational leaders are deemed to be charismatic in their approach. Individuals who are charismatic in nature exude a high level of charm, grace and style. They are also very confident and have high self- esteem. They have a magnetic effect on the followers who enjoy the energy and passions produced from such behaviour and view the individual as a role model that they can aspire to imitate. A charismatic leader has the ability to get in touch with others on a highly emotive level and can easily inspire, motivate and gain the respect of the followers (Parolini, Patterson, & Winston, 2009).

There is a fine line between being charismatic and being self-centred. A leader should be aware of this potential pitfall and ensure a selfless and humble nature. Transformational leaders are generally humble thereby attracting a huge following and support (Parolini, Patterson, & Winston, 2009). They realise that the basic act of offering the apology when due, could be the start of transformation. Apologising when a mistake is made is seen as strength rather than a weakness. Apologising is a form of humility and demonstrates that even leaders make mistakes and are willing to learn and grow from them (Bass, Avolio, Jung, & Berson, 2003).

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The transformational leader provides the team with an identity by encouraging and inspiring them to challenge themselves and the *status quo*. This in turns releases the best from the team and encourages them to be innovative, creative and unique.

2.12.2 Transactional Leadership

Transactional leaders are also referred to as servant leaders. They understand the goals already set up by the company and ensure that policies and procedures are adhered to, in order to meet the goals already defined. Where transformational leadership recognizes individual talents and builds enthusiasm by appealing to emotions, values, and belief systems, transactional leadership promotes compliance by appealing to the needs and wants of individuals (Parolini, Patterson, & Winston, 2009).

Transformational Leadership is more inclined towards meeting organisational strategic objectives. This leadership personality style is generally charismatic and the leader exudes the behaviour of a good role model in terms of morals, ethics and integrity. Transactional Leadership however places emphasis on individual needs and growth and incentivises staff for achieving agreed objectives. Transactional managers can grow in time into transformational leaders as they gain better understanding of the organisation's long term strategic objectives. A leader possessing both Transformational and Transactional traits can address any situation quite easily by switching between the two styles of leadership (Parolini, Patterson, & Winston, 2009).

2.13 Conclusion

The various definitions of virtual teams in the current literature review were explored. For the purpose of this study, the definition by Piccoli, Powel and Ives (2004) is used to define virtual teams. Virtual teams are geographically dispersed teams who work together across time and space using information and communication technologies to accomplish one or more organisational tasks (Piccoli, Powell, & Ives, 2004).

The conflicting arguments in academic literature concerning virtual teams and unified communication were explored and discussed. The academic literature referenced is fairly recent, using authors who are considered experts in the field of virtual teams and globally dispersed teams. This section elaborated on the challenges faced by virtual teams, the aspects that work well in virtual teams, the various leadership styles effective in a virtual team

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environment, the differences between virtual teams and face-to-face teams, the basic elements that make up a successful virtual team, communication within virtual teams and global mind-set changes that are required when operating in a virtual team environment.

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CHAPTER 3: RESEARCH QUESTIONS

3.1 Introduction

The difference technology makes in leading global virtual teams is explored through the research questions in this chapter. The usefulness and effectiveness of a unified communication tool is questioned. The leadership style for an effective virtual team is questioned. Finally, the various enablers to create a conducive and sustainable virtual team are also explored. This chapter summarises the purpose of the research study. The underlying research question is based on the effectiveness of unified communication in a virtual team environment.

3.2 Research Question 1: Is Unified Communication an effective tool for leading Virtual Teams?

A number of different information and communication tools exist in a virtual team environment. A unified collaboration and communication system enable users to integrate all their messages and communication through a single service that can be accessed by several devices (Wang & Katz, 2001). Virtual teams rely on web-based technologies and web based information systems to communicate, collaborate and share information in the absence of face-to-face communication. However, Horwitz, Bravington and Silvis (2006) disagree and state that technology provides a great mechanism for virtual teams to communicate but cannot completely replace face-to-face communication.

The question sought to understand the need for unified communication tools in leading virtual teams. A unified communication tool consists of a number of components. Are all the components really needed or are some components simply nice to have? There are numerous challenges that virtual teams face. Does unified communication alleviate or reduce these challenges making it an effective tool for leading virtual teams? The outcome of this question emphasises the effectiveness of unified communication as a tool to lead virtual teams.

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3.3 Research Question 2: Is there a specific leadership style that will suit virtual teams using Unified Communications?

Leadership style and traits in a virtual team differ from traditional teams. With virtual teams, leaders are not always aware of what the virtual team members are working on as resources could be spread across the globe and across time-zones. This makes leading and managing virtual teams' complex (Horwitz, Bravington, & Silvis, 2006). Leadership challenges in a virtual team context are further amplified due to the lack of face-to-face interaction whilst being able to lead multi-cultural teams across the globe.

The question sought to comprehend what the characteristics and traits of an effective leader for virtual teams are. Do virtual teams require a different type of leader? Will unified communication enable this type of leader to perform effectively? The outcome of this question stresses the type of leader who will be effective in a virtual team environment.

There are different types of leadership styles ranging from participative, authoritative, coaching and neutral, to transformational and transactional leadership (Matshekga, 2009). Is there a particular style of leadership that is suitable for the management of virtual teams? What are the traits of an effective leader in a virtual team context?

3.4 Research Question 3: What are the enablers for effective virtual teams?

Virtual teams consist of members with specialised skills who are known to work independently without supervision. These teams are assembled to address complex projects often accessing the best skills around the globe to deliver projects (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). These teams are known to be flexible and adaptive allowing organisations to respond quickly to competitive pressure. How do virtual teams achieve these results?

The question sought to understand the various enablers that aid in a successful virtual team. A number of advantages and enablers exist for virtual teams. What are the common themes that are regarded as vital components or enablers that lead to successful, effective and sustainable virtual teams?

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3.5 Conclusion

The answers to the questions above aim to reveal the effectiveness of unified communication in leading a virtual team, the type of leadership suitable for leading virtual teams and whether unified communication can replace traditional face-to-face communication in a virtual team environment.

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CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

To answer the research questions posed in chapter 3, a survey questionnaire was used to gather the required data to perform this research. The survey questions was based on previous research and adapted to address the research questions. It was setup using an online tool, SurveyMonkey™ and the link was e-mailed an initial pre-test pilot group. Based on the response from the pilot group, the survey was amended to ensure that the research questions were being addressed. The qualitative data was edited to remove spelling and grammar errors and is available in Appendix-I. The quantitative data was analysed using Principle component analysis and Kaiser-Meyer-Olkin (KMO) index.

Based on the data collected, tests for normality were run to determine if parametric or non-parametric tests would be used for the data set. As the sample size was greater than 50, the Kolmogorov-Smirnov test was used (Weiers, 2011). The Shapiro-Wilk test was also used as this is usually used for samples less than 50 but suitable for sample sizes up to 2000. These tests compare the distribution of the sample with a comparable normal distribution curve.

In order to understand if unified communication is a vital tool for leading virtual team, a Spearman rank correlation was conducted. This allowed the researcher to understand and verify the significant associations. A detailed view of these correlations is provided in Appendix-J, Appendix-K and Appendix-L.

This chapter discusses the research methodology used and elaborates on the reasons for using the selected methodology. The population and sample is also discussed and the instruments used to collect the data are defined and discussed. Advantages and limitations of the research instruments are also covered and the process used to analyse the data is discussed whilst reasons are provided for the selected approaches used for data analysis. The chapter concludes with some of the limitations of this research emphasising some potential flaws in the research process.

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4.2 Research Approach

This study aimed to understand whether unified communication is an effective tool for leading virtual teams. The benefits of using virtual teams are also explored and discussed in this research paper. To effectively lead virtual teams it is important to understand the importance of unified communication as a tool. It needs to be determined whether virtual teams can be successful without the use of a unified communication tool, and whether all components of a unified communication tool are vital or if some components are simply nice to have. These fundamental questions are investigated.

4.3 Research Method

A combined quantitative and qualitative study was carried-out through the administering of online questionnaires using SurveyMonkey™ as a tool for this purpose. This research started with the design of the research questionnaire on virtual teams. The questionnaire was based on questions adapted from the Bolman Deal Leadership model questionnaire (Bolman, 2013), which was customised by Beaty (2005) and later used by Mogale (2009) and again by Mogale and Sutherland (2010).

Questionnaires are known to have a number of disadvantages, ranging from low response rates, ambiguity of questions, respondent bias, respondent not understanding the question due to cultural differences or poor wording of the questions to the respondent assuming a frame of reference other than what the researcher intended (Weiers, 2011). Another disadvantage of using questionnaires when conducting online research is that researchers can encounter problems with their sampling of data as little information may be known about the characteristics of people in online communities aside from their available demographic information (Wright, 2005) . Self-selection bias is another disadvantage of online surveys as there are some individuals who are more likely to complete the online survey than others. There is an inclination of some individuals to respond to online surveys while others ignore it, leading to a systematic bias (Wright, 2005). For this research that focuses on virtual teams, the survey however was an effective tool to gather information as it provided the perfect mechanism to access virtual team members around the globe.

To overcome the challenges highlighted above, a pre-test questionnaire was used. Pre-test questionnaires may however not completely mitigate the misinterpretation of questions but

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any flaws identified in the questionnaire design based on the responses from the pilot group can be rectified, before the survey is sent to a wider audience.

The advantage of using questionnaires is their cost effectiveness and the ability to collect data from geographically dispersed regions. The advantage of online survey research is that it leverages the ability of the Internet to provide access to organisations, groups and individuals who would otherwise be difficult to reach (Wright, 2005). Researchers find the internet an ideal domain for conducting research and a number of virtual communities are available online with a wide audience regularly participating in online discussions in almost every topic (Wright, 2005). Another advantage is that Internet-based survey research may save time for researchers as it allows the researcher to collect information as they focus on other tasks or activities (Wright, 2005).

According to Saunders & Lewis (2012), a number of common factors threaten the reliability of research findings and conclusions. These factors range from subject error, subject bias, observer error to observer bias (Saunders & Lewis, 2012). Saunders and Lewis further stated that the two sources of error that may be encountered are random sampling and systematic (non-sampling) error. Due to the volume and experience of many researchers in this field, random sampling error may have occurred. However by implementing a pilot survey first and through careful re-construction of the questions used, this was minimised.

4.4 Research Design

According to Saunders and Lewis (2012), the two main approaches to research are either through deduction or induction. The purpose of research design is to answer the research questions and propositions discussed earlier. According to Saunders & Lewis (2012), the five stages in deductive research include, defining the research questions; specify the way in which the questions should be answered; seek answers to the questions defined; analyse the results; confirm the initial theory or modify it and repeat the five steps.

To answer these questions, this research paper followed the ‘induction approach. Saunders and Lewis (2012) stated that the induction approach takes specific observations to broader generalisations and theories. Inductive reasoning uses observations and measures so that repeated patterns can be observed. These patterns are then used to formulate hypotheses.

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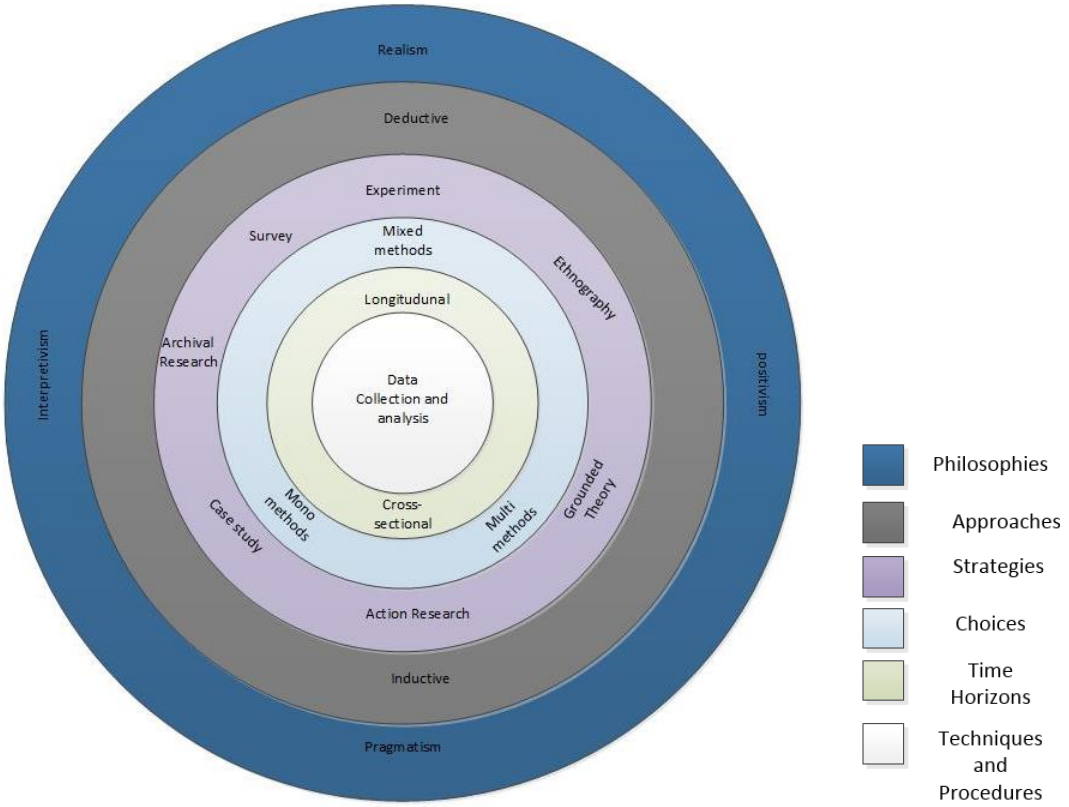
Figure 4-1 The Research Onion (Saunders & Lewis, 2012)



4.4.1 The Research Onion

Saunders and Lewis (2012) used the metaphor of the various layers of an onion to describe the research process. The outer layers describes the research philosophies and approaches, the central layers describe the various research strategy and choices and the centre of the onion represents the time horizons, techniques and procedures used for data collection and data analysis.

The research philosophy layer defines the different ways that data can be collected and analysed. Saunders and Lewis (2012) defined a number of philosophies ranging from positivism, realism, interpretivism to pragmatism. The next layer of the research onion described the two types of approaches that could be used to conduct research. Saunders and Lewis (2012) defined deduction as "*a research approach which involved the testing of a theoretical proposition by using a research strategy specifically designed for the purpose of its testing".* Saunders and Lewis (2012) also defined induction as "*a research approach which involves the development of theory as a result of analysing data already collected".*

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There are various strategies that a researcher could adopt when conducting research. According to Saunders and Lewis (2012), these strategies could include experiments, surveys, case studies, actions research, grounded theory, ethnography and archival research. The next layer in the research onion is choice. According to Saunders and Lewis (2012), the researcher can use qualitative, quantitative or both methods to conduct research. The next layer described the time horizons which stipulate the time limit for the research. The final layer in the research onion is the data collection and data analysis layer. This layer is discussed in detail later in this chapter.

4.4.2 Sampling Technique

The sampling method used in this research was based on the non-probability (subjective) sampling technique using the convenience sampling technique (Saunders & Lewis, 2012). The snowball technique was used to gather the sample data set. The reason for selecting the snowball technique was based on the fact that the managers who lead virtual teams often knew other managers or subordinates who participated in a global virtual context. Non-probability convenient sampling technique was also used. Michael Watkins, a Harvard Professor started a blog earlier in 2013 that focuses on the factors that make virtual teams successful (Watkins, 2013). Almost all active members on this blog, who were researchers, academics, managers and virtual team practitioners from around the globe, participated in the research survey for this paper. According to Saunders and Lewis (2012), sampling makes it possible to generate findings that are representative of the whole population without necessarily collecting data from the whole population.

4.4.3 Data Collection Technique

Data collected can fall into two categories, namely primary or secondary data. Primary data is generated by the researcher to solve a problem or answer the research questions while secondary data has been collected by someone else for some other purpose. Secondary data can be used by researchers if the information available in the dataset can assist in answering their research questions. Secondary data can fall into two categories, namely internal data or external data. Internal data is data generated from within the researcher's firm or organisation while external data is generated from outside the organisation (Weiers, 2011).

Primary data was collected using a both a qualitative (exploratory) approach as well as a quantitative approach. The qualitative, exploratory data included an open ended question in an expert survey (Appendix-F) which allowed respondents to document their significant

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challenges within virtual teams as wells the aspects that worked well within their virtual teams. A full list of these responses is provided in Appendix-I (Part 1).

A quantitative, descriptive research method was also used. According to Saunders and Lewis (2012), surveys are ideal for exploratory and descriptive research as they allow for the collection of the same type of information from a large number of respondents in a cost-effective way. A detailed survey questionnaire (Appendix F) was sent to number selected participants.

4.4.4 Survey Approach

The survey (Appendix F) was set-up on SurveyMonkey™ which is an online survey tool used for gathering information. The initial survey link was e-mailed to a selected target audience who were identified as the pilot group for this survey. 100% response rate was received from the pilot group. The results of the feedback were analysed to ensure that the research questions were being answered. Slight modifications were then made to the survey and the link was e-mailed to the selected sample audience. Of the 220 survey invites that were sent to the target audience, 213 responses were received, achieving a response rate of roughly 97%.

4.5 Research Instrument

4.5.1 Questionnaire Design

The study required the collection of data from virtual team members from around the globe and was built on work previously done. The questionnaire used was adapted from the Bolman Deal Leadership model questionnaire which was customised by Beaty (2005) and later used by Mogale (2009) and again by Mogale and Sutherland (2010). In addition to the survey questions that required respondents to choose an answer based on a Likert scale, open-ended questions were also used to allow respondents to capture their experiences around what makes virtual teams. It allowed respondents to list those elements that made virtual teams successful as well as the opportunity to highlight challenges that would typically be faced in a virtual team context. Saunders and Lewis (2012) stated that open-ended questions are used when the researcher is unsure of the response and desires the respondents' views on a particular area.

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4.5.2 Pre-testing of the Questionnaire

Once the questions to be administered were finalised, the next step of data collection involved a pilot-test of the questionnaire. The pilot test enabled the researcher to determine if the data collected from the questionnaire did, in fact, answer the research question. The pre-testing involved the administration of the questionnaire to 20 individuals. These 20 individuals were selected based on convenience. The pre-testing of the questionnaire allowed the researcher to understand if there were problems in the design of the questionnaire and instructions and to understand if there were gaps in the questions asked. This also allowed the researcher to understand if the questions were interpreted correctly and uncovered any potential misunderstandings regarding the questions that were asked.

The pre-test did in fact reveal a few gaps but in general the strategic research questions were being answered. The survey was amended to address the shortcomings of the pilot survey and sent to the wider audience of 220 participants in 37 countries.

4.6 Data Collection

In order to understand virtual teams holistically, the enablers of virtual teams, the inhibitors of virtual teams, leadership in virtual teams and unified communication within virtual teams, respondents were asked to complete an online questionnaire on Survey Monkey™ (an online survey tool). The survey questionnaire was based on Likert scale questions as well as open-ended questions. The open-ended questions allowed for respondents to add and elaborate on any significant points and possibly explain their answers. The closed-ended questions were based on a four point Likert scale which included ‘Not important at all’, ‘Somewhat important’, Very important’ and ‘Critically important’. A sample of the questionnaire is provided in Appendix-F. All questions were administered in English.

4.7 Population and Sampling

According to Saunders and Lewis (2012), population is defined as the complete collection or complete set of group members to be studied. The relevant population for this research was any person working in a virtual team anywhere in the world. It included any person who interacted with another person not based in the same office.

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The sample population is defined as a sub-group of the whole population (Saunders & Lewis, 2012). The sample included virtual team members who were either managers of a virtual team, a subordinate in a virtual team or a person who played both roles being a manager and a subordinate within a virtual team. The sample was based on the premise that even though virtual teams could exist in the same city, the focus of this research paper was on virtual teams operating in different countries. The sample was restricted to 37 countries, based on convenience.

The sampling technique used was based on non-probability (subjective) sampling technique. The snowball technique was used to gather the sample data set. Data was collected from one large multinational that has offices in 112 countries as well as virtual team members around the globe. The non-probability convenient sampling technique was also used where members in an active virtual team blog were asked to participate in this survey. The sample size of 220 individuals, representing virtual team members was originally targeted for this research. Data was collected over a three month period with two hundred and thirteen (213) responses received from thirty seven (37) countries.

The survey (Appendix-F) was arranged on SurveyMonkey™, an online survey tool used for gathering information. The initial pilot-survey link was e-mailed to a selected target audience who were identified as the pilot group of 20 virtual team members for this survey. A 100% response rate was received from the pilot group. The results of the feedback were analysed to ensure that the research questions were being answered. Slight modifications were then made to the survey and the link was e-mailed to the selected sample audience. From the 220 invites that were sent to the target audience, 213 responses were received achieving a response rate of roughly 97%.

While the primary aim of the research is to understand whether unified communication is a vital tool for leading virtual teams, further dissection by region or culture would have been appropriate, however insufficient data was collected, and thus dissection by different regions was not suitable for this study. This represents a limitation on the findings and interpretation of the results. All data was stored electronically on the researcher's computer and a back-up of data from all questionnaires is stored on a cloud based system.

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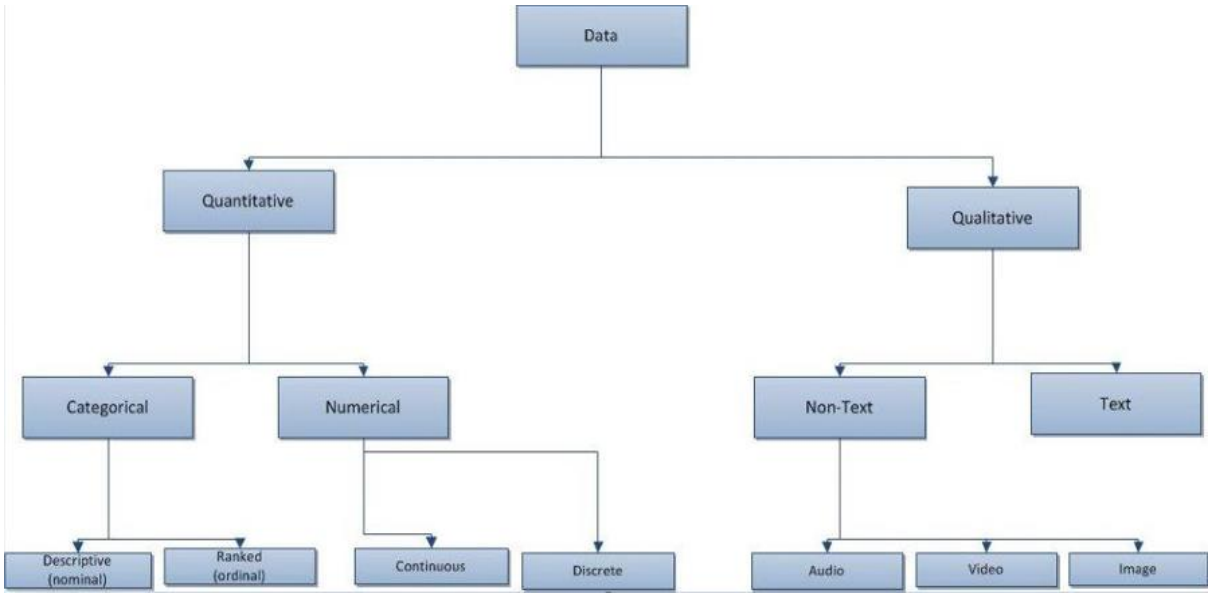
4.8 Data Analysis Approach

According to Saunders and Lewis (2012), data is classified into two different types, namely quantitative data and qualitative data. Quantitative data is further divided into categorical data and numerical data. Categorical data has values of observations that can be sorted into groups or categories. Bar charts and pie charts are typically used to represent categorical data. Categorical data is further divided into nominal values or ordinal values (Weiers, 2011).

Figure 4.2: Types of data (Saunders & Lewis, 2012)



Nominal values or observations can be assigned a code in the form of a number where the numbers are simply labels. This data can be counted but cannot be ordered or measured. Examples are sex, and eye colour of the respondents. Mode is used to measure central tendency for this type of data. Ordinal values or observations can be ranked or placed in order or have a rating scale attached. This type of data can be counted and sorted but cannot be measured. Examples are the number of years that the respondents worked in a virtual team environment. The median is used to measure central tendency for this type of data (Weiers, 2011).

The survey data was grouped and analysed according to three broad areas. The three areas analysed were ‘enablers for virtual teams’, ‘unified communication in virtual teams’ and ‘leadership in virtual teams’.

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Saunders and Lewis (2012) stated that numerical data is made up of continuous or discrete data. Numerical data are values or observations that can be measured and can be placed in ascending or descending order. Scatter plots and line graphs are used to graph numerical data (Weiers, 2011).

If the data is normally distributed the mean is used to measure for central tendency. If the data is not normally distributed, the median is used. Numerical data consists of either discrete values or continuous values. Discrete values or observations can be counted and these values are distinct and separate. Examples are the number of respondents to this survey or the number of countries from the data set received. Continuous values can be measured. Values or observations may take on any value within a finite or infinite interval. Examples are the height of respondents, time that the respondents completed the survey (Weiers, 2011). Weiers (2011) stated that four stages of data-cleansing are required prior to data analysis which includes the editing, coding, data entry and data analysis phases.

4.8.1 Data Editing

The data collected from the online questionnaires, in particular, the open-ended questions were subject to some editing. The open ended questions had spelling and grammatical errors. These were corrected, updated and attached in Appendix-I. Legibility was not an issue for the survey responses, as all questionnaires were completed online using the SurveyMonkey™ tool.

4.8.2 Coding of Data and Data Entry

The data was coded after the completion of the editing phase. This coding allowed for the responses received to be converted into numerical values. The open-ended questions were not coded, but rather grouped into general themes, which assisted in identifying specific categories of data that were common. The categories ranged from “enablers of virtual teams”, to ‘inhibitors in virtual teams’, and ‘unified communication in virtual teams’ as well as ‘leadership in virtual teams’. The coded data was captured on Microsoft Excel for further analysis. This allowed for statistical analysis using the IBM® SPSS® statistics package. A detailed report of this analysis is provided in Appendix-J, Appendix-K and Appendix-L.

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4.8.3 Normal Distribution

Normal distributions are used to describe a symmetrical, bell-shaped curve, which has the greatest frequency of scores in the middle and smaller frequencies on either side of the bell-shaped curve (Weiers, 2011). Normal distribution is defined as a family of distributions, each member of which is bell-shaped and symmetrical (Weiers, 2011). Normality can be analysed by using skewness and kurtosis. For this research, normal distribution is assumed. A detailed extract of the descriptive statistics showing the skewness and kurtosis is provided in Appendix-R.

Figure 4-3 A typical normal distribution curve (Weiers, 2011)

4.9 Principle Component Analysis (PCA)

When dealing with a large dataset, a common data reduction technique is applied to the dataset. The data reduction test allows for large datasets to be reduced to a smaller number of factors (Weiers, 2011). PCA is a method of data reduction so that only those variables with the greatest variance remain to be analysed (Weiers, 2011). The output of the PCA analysis for “Enablers of Virtual teams”, “Leadership in Virtual Teams” and “Unified Communication in Virtual Teams” is provided in Appendix-J, Appendix-K and Appendix-L, respectively.

4.10 Kaiser-Meyer-Olkin (KMO) Index

The Kaiser-Meyer-Olkin (KMO) index is part of the Principle Component Analysis (PCA) test and tests whether the PCA is appropriate for the variables being tested. KMO measures greater than 0.6 are suggested for a good factor analysis. To ensure that factor analysis is appropriate, Barlett’s test of sphericity needs to be significant which means that the significant value for the test must be less than 0.05 (Weiers, 2011). These tests were conducted on the

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data to ensure that factor analysis and more specifically the principle component analysis was appropriate in this study as a data reduction tool.

4.11 Correlation

In order to understand if unified communication is a vital tool for leading virtual team, a Spearman rank correlation was conducted. This allowed the researcher to understand and verify the significant associations. A detailed view of these correlations is provided in Appendix-J, Appendix-K and Appendix-L. The Spearman rank correlation was used as it measures the strength and direction of relationship between paired observations in which two variables are at least ordinal (Weiers, 2011).

4.12 Research Limitations

The primary aim of this research was to understand if unified communication is a vital tool for leading virtual teams. Further dissection by region or culture would have been appropriate, however insufficient data was collected, and thus dissection by different regions was not suitable for this study. Another angle that could have been pursued is the research was based on industry specific data. Industries differ in their aims, objectives and culture based on their location. Thus when analysing multiple industries together these may not allow for the industry specific trends to be analysed and evaluated. In hindsight, the use of mobile devices should have been included in the survey questions as this is probably the most used electronic device today.

The researcher's experience when using non-probability sampling is a vital aspect to analysis. The research may not have adequate experience in the field. The questionnaire was only sent out in English. As responses were received from 37 countries around the globe where English may have not been the first language of the virtual team members, there is a possibility that the respondents may have interpreted or completed the questionnaire incorrectly.

4.13 Conclusion

This chapter discussed the research methodology used to accomplish the goals and objectives of this study. The research method used and the reasons for using the chosen methodology was exposed in this chapter. The population, sampling frame and sampling

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technique for this research were defined. The design of the questionnaire was discussed with the advantages and disadvantages of the questionnaire technique also documented. The data collection techniques used was discussed, including the relevant reasoning for the chosen methodology. The population and sampling frame was defined, the sampling technique that was used, and the rationale for the selected method was also discussed. The design of the questionnaire and the process used to collect the necessary data was discussed.

The limitations and shortcoming of the research methodology were emphasised and discussed. The researcher was aware of these limitations and the implications of these limitations on the final analysis of the dataset. A detailed analysis and interpretation of the data collected through the above methods is discussed in the next chapter.

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CHAPTER 5: PRESENTATION OF RESULTS

5.1 Introduction

The questionnaire used to survey virtual team respondents from around the globe for this research paper was adapted from the Bolman Deal Leadership model questionnaire which was customised by Beaty (2005) and later used by Mogale (2009) and again by Mogale and Sutherland (2010).

The survey was initially sent to a selected pilot group consisting of 20 team members from virtual teams around the globe. These individuals, worked for a large multinational organisation with offices in 112 countries. All 20 team members responded, resulting in a 100% response rate on the survey pilot group. The data was then analysed to determine whether the research questions were in fact being answered. Based on this analysis, additional questions were added to the survey. The updated survey was sent to 220 virtual team members, of which 213 responded resulting in a 97% response rate on the virtual team survey. The remaining sections of this chapter offer a presentation of the results from this survey.

Results indicated by Kolmogorov-Smirnov and Shapiro-Wilk tests exposed that the data is not normally distributed thus non-parametric tests were used. The results from the Kolmogorov-Smirnov and Shapiro-Wilk test for normality are provided in Appendix-S. When data is normally distributed, valid inferences can be made from the sample dataset. For the purposes of this research, normal distribution was assumed and non-parametric tests were used (Weiers, 2011).

Principle Component Analysis (PCA) is typically used on large datasets. As the result of PCA is considered acceptable if the data set is above 200, principle component analysis was used for this research. PCA is a method of data reduction so that only those variables with the greatest variance remain to be analysed. The output of the PCA analysis for “Enablers of Virtual teams”, “Leadership in Virtual Teams” and “Unified Communication in Virtual Teams” is provided in Appendix-J, Appendix-K and Appendix-L respectively (Weiers, 2011).

The correlation matrix was used to analyse correlations between variables that were too high (e.g. 0.9 and higher). PCA is a data reduction technique and is used to reduce the number of variables that need to be analysed. When the correlation is too high, meaning that the r-value is high, these items were removed from the data analysis as it could be measuring the same

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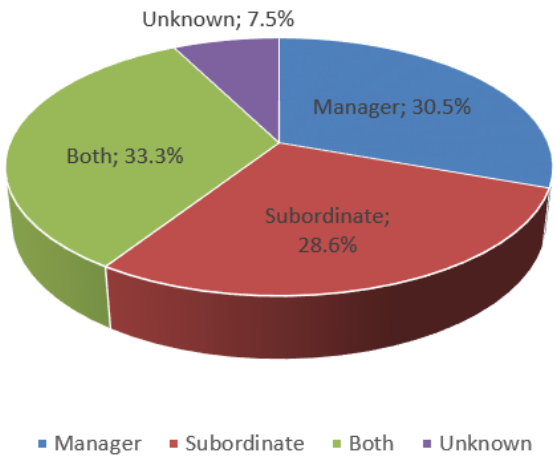
thing. In the virtual team data set, any item with r-value < 0.3 was excluded from the analysis. Items with r-value > 0.3 indicated a strong association and were included in the analysis (Weiers, 2011).

This chapter contains samples of the results from the data analysis. Tables, graphs and information from the survey responses are presented conveying detailed messages and important themes from the data gathered.

5.2 Descriptive Data

5.2.1 Question 1: What role do you perform in a virtual team?

Figure 5-1 What role do you perform in a virtual team environment?



From the 213 responses, 16 respondents did not specify their role within the virtual teams. 65 respondents were managers, 61 respondents were subordinates and 71 respondents were both managers as well as subordinates within virtual teams. The respondents that did not specify their role accounted for 7.5% of the total responses. Managers accounted for 30.5%, subordinates accounted for 28.6% and team members who were both subordinates as well as virtual managers accounted for 33.3% of the total responses.

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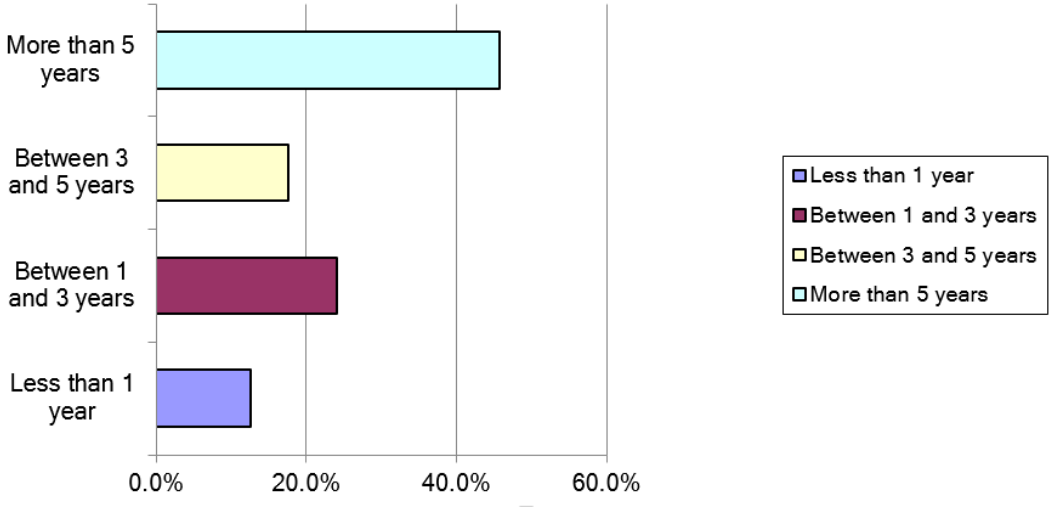
5.2.2 Question 2: How long have you worked in a virtual team?

Figure 5-2 How long have you worked in a virtual team?



From the 213 responses, 14 respondents did not specify the number of years they had worked in or were part of a virtual team. 25 respondents had worked less than one year in a virtual team environment, 48 respondents had worked between one and three years, 35 respondents worked between three and five years whilst 91 respondents worked for longer than five years in a virtual team environment. This implied that the bulk of the responses received where from experienced virtual team members.

5.2.3 Question 3: In which country are you based?

From the 213 responses, 30 respondents did not specify the country where there are based. The remaining 183 respondents were from literally all around the globe. Respondents ranged from Australia, Austria, Denmark, Egypt, El Salvador, England, France, Guatemala, India, Ireland, Japan, Kenya, Lebanon, Lithuania, Malaysia, Namibia, New Zealand, Nigeria, Pakistan, Panama, Poland, Portugal, Saudi Arabia, Singapore, Slovenia, South Africa, Sweden, Thailand, The Netherlands, Trinidad & Tobago, Turkey, United Arab Emirates, United Kingdom and the United States of America. A detailed list of all survey responses per country is provided in Appendix-I (Part 2).

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5.2.4 Question 4: What skills or characteristics do you regard as important for effectively managing virtual teams?

Figure 5-3 Leadership skills effectively managing Virtual Teams

Leadership Skills - Critically Important	Not important at all	Somewhat Important	Very Important	Critically Important	Rating Average	Response Count
Interpersonal skills (ability to interact with others)	0	4	65	129	3.63	198
Good listener	0	11	78	109	3.49	198
Ability to energise and inspire others	0	12	96	90	3.39	198
Ability to excite and motivate	0	24	90	83	3.30	197

Leadership Skills - Very Important	Not important at all	Somewhat Important	Very Important	Critically Important	Rating Average	Response Count
Concern for people	0	30	114	50	3.10	194
Attention to detail	1	41	106	47	3.02	195
Caring and support for others	3	35	106	47	3.03	191
Ability to make good decisions	0	21	103	74	3.27	198
Ability to succeed in the face of conflict and opposition	1	20	103	69	3.24	193
Analytical skills (ability to visualize, articulate and solve	0	39	102	55	3.08	196
Imagination and creativity	7	58	99	29	2.78	193
Ability to coach and develop people	2	25	99	72	3.22	198
Clear, logical thinking	2	19	97	73	3.26	191
Ability to energise and inspire others	0	12	96	90	3.39	198
Being a humanist (concern for human welfare, values, and	0	53	96	45	2.96	194
Being a visionary (having foresight, imagination and	6	39	96	53	3.01	194
Networking skills (Developing and using contacts in	3	42	96	55	3.04	196
Inspirational leader	2	36	92	67	3.14	197
Ability to excite and motivate	0	24	90	83	3.30	197
Skilled negotiator	2	47	90	57	3.03	196
Being a networker	6	51	89	47	2.92	193
Ability to build strong alliances	2	29	88	79	3.23	198

Based on the descriptive statistics from the survey responses, skills that were regarded as critically important for effectively managing virtual teams were interpersonal skills, the ability to excite and motivate others, good listening skills and the ability to energise and inspire others. Also regarded as very important but not critically important were analytical skills, networking skills, skilled negotiators, inspirational leaders, ability to make good decisions, ability to coach and develop people, ability to build strong alliances and the ability to energise and inspire others, attention to detail, concern for people, ability to succeed in the face of conflict and opposition, clear logical thinking, caring and support for others, imagination and creativity, being a humanist, being a networker and being a visionary. These categories were all highly ranked by the respondents as significant characteristics for leading virtual teams.

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5.2.5 Question 5: What are Enablers for effective Virtual Teams

Table 5-1: Enablers and Unified Communication for Virtual Teams

Enablers for Virtual Teams - Critically Important	Not Important at all	Somewhat Important	Very Important	Critically Important	Rating Average	Response Count
Knowing how to build a good relationship with a person without meeting them face to face	1	12	67	113	3.51	193
Embedding a common vision within the team	0	10	74	109	3.51	193
Using the right technology to communicate	0	10	81	101	3.47	192
Clearly defined roles and responsibilities	1	5	65	121	3.59	192
Team members being able to work independently	1	15	78	97	3.42	191
Manager understanding different working environments	1	15	82	94	3.40	192

Enablers for Virtual Teams - Very Important	Not Important at all	Somewhat Important	Very Important	Critically Important	Rating Average	Response Count
Building strong team identity	2	22	115	53	3.14	192
Properly structured communication forums	0	23	113	57	3.18	193
Celebrating successes	0	20	108	65	3.23	193
Team meetings enabling enough time to have informal discussions	3	49	107	33	2.89	192
Identifying and engaging quiet people during conference calls	3	32	104	54	3.08	193
Feeling cared for by managers	4	48	104	35	2.89	191
A manager being a good role model	0	28	102	63	3.18	193
Continuous coaching on how to perform work better	2	46	99	46	2.98	193
Data systems accessible to everyone	2	23	87	81	3.28	193
Use of Tele Conferencing	4	31	81	76	3.19	192
Ensuring that all team members receive the same message at the same time	8	38	79	68	3.07	193
Use of Instant Messenger or chat	7	38	78	70	3.09	193
Meeting face to face as a team at least once every 2 months	18	86	53	35	2.55	192

Based on the survey responses, the following “enablers for virtual teams” were regarded as critically important: Embedding a common vision within the team, clearly defined roles and responsibilities, team members being able to work independently, manager understanding different working environments, knowing how to build good relationships and using the right technology were highly ranked as critical enablers for virtual team leadership. Also regarded as very important to “Enablers for Virtual Teams” but not critical, was: building a strong team identity, managers being good role models, continuous coaching on how to perform work better, the ability to identify and engage quite people during conference calls, being cared for by managers, ensuring that all team members receive the same information, celebrating successes and proper communication forums.

From a unified communication perspective, using the right communication tools to communicate was ranked as a critical ‘Enabler for Virtual Teams”. The use of video conferencing, however, was not regarded as a critical enabler. The use of teleconferencing, instant messenger and chat, the use of presence to indicate current communication status, the use of data sharing and electronic whiteboards, providing technology for social interaction and the use of photographs to visualise the person or an organogram were all ranked as critical components or “Enablers for Virtual Teams”.

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5.2.6 Question 6: Which of these factors inhibit the effective leadership of Virtual Teams?

Table 5-2: Inhibitors for Virtual Teams

Inhibitors for Virtual teams	Don't prevent at all	Somewhat prevent	Definitely prevent	Extensively prevent	Rating Average	Response Count
Lack of trust	3	15	54	115	3.50	187
Delays in resolving conflicts	4	17	79	85	3.32	185
Availabilty of electronic tools to communicate	9	35	68	77	3.13	189

Inhibitors for Virtual teams	Don't prevent at all	Somewhat prevent	Definitely prevent	Extensively prevent	Rating Average	Response Count
Inability to make decisions in the absence of a manager	7	37	111	35	2.92	190
Difficulty in communicating with people from other cultures	3	28	95	63	3.15	189
Not considering different time zones when setting up	1	25	90	74	3.25	190
Lack of knowledge about virtual team environment	5	55	88	42	2.88	190
Misunderstanding instructions given	4	24	84	78	3.24	190
Lack of feedback and coaching	3	31	84	72	3.18	190
Lack of sharing knowledge and cross team learning	5	29	84	69	3.16	187
Being task driven rather than building relationships	9	79	82	19	2.59	189
Delays in resolving conflicts	4	17	79	85	3.32	185

Based on the survey response, the most critical inhibitor was the lack of trust, the availability of electronic tools to communicate and delays in resolving conflicts. Other inhibitors that were emphasised included the lack of knowledge about the virtual environment, not considering different time zones when setting up meetings, leaders being task driven rather than focusing on building relationships, the inability of team members to make decisions in the absence of a manager, difficulties when communicating with team members from different cultures, misunderstanding or not comprehending the instructions given, lack of feedback and coaching and the lack of knowledge sharing and cross-team learning.

5.2.7 Question 7: When leading virtual teams, what are some of the challenges that you face and what are some of the aspects that work well?

This section of the questionnaire was open-ended, allowing the respondents to document their fundamental challenges within their virtual teams and what aspects of the virtual teams worked well. A comprehensive list of this feedback is provided in Appendix-I.

A few common themes emerged as key challenges as well as aspects that work well in virtual teams through the various responses. The summary below is a graphical representation of this information.

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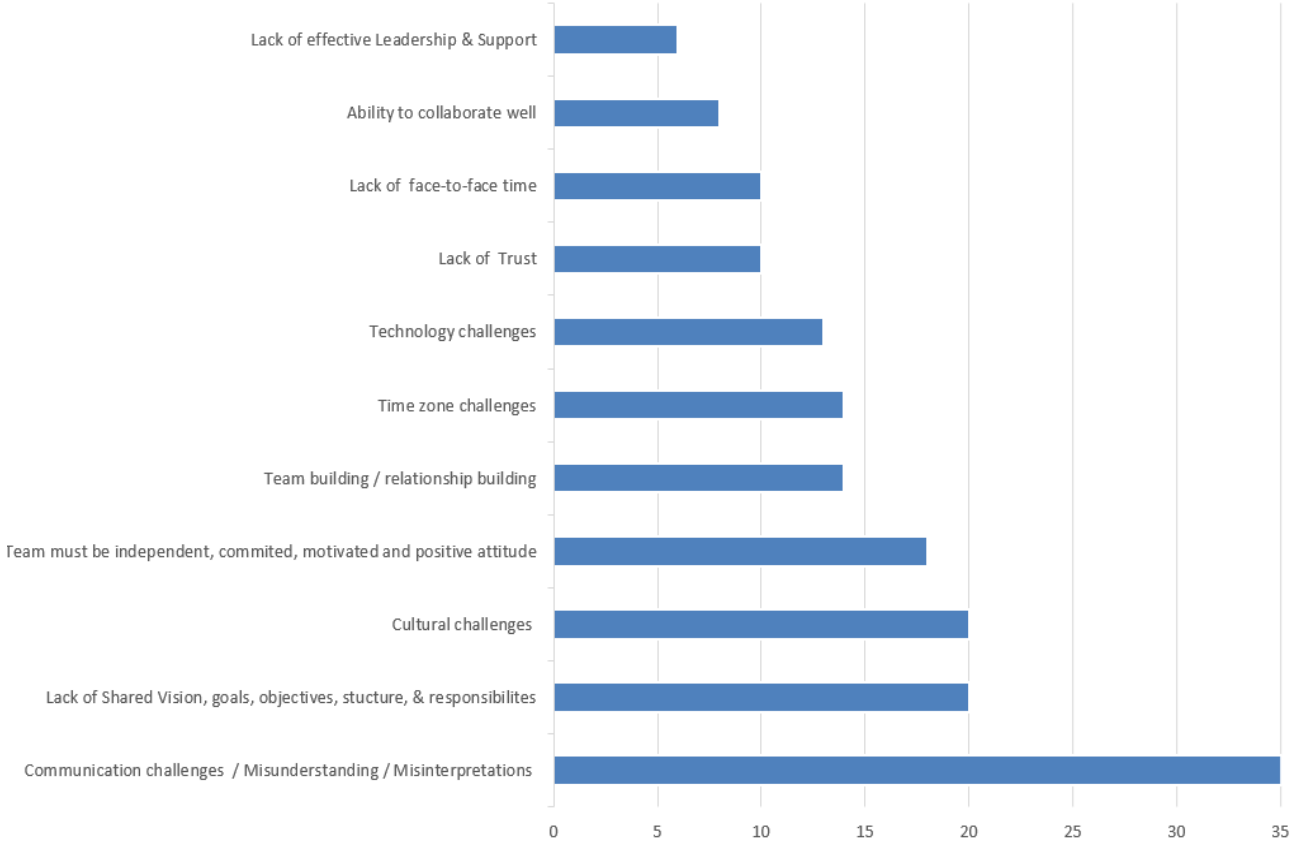
Figure 5-1 Challenges faced by Virtual Teams (Common themes from open-ended questions)



Significant themes that emerged as challenges were: communication challenges within virtual teams, misunderstanding and misinterpretation of information, lack of share vision and goals, lack of common objectives, lack of structure within teams, roles and responsibilities not clearly defined, cultural challenges ranging from communication issues to conflicts due to misunderstanding the various cultures to cultural prejudice within virtual teams. Independence, commitment, motivation, positive attitude and the ability to work without supervision were also listed as challenges.

Even though virtual teams may be literally distributed around the globe, the need for team building and relationship building amongst the virtual team was also a common theme from the responses. Technology challenges ranged from bandwidth issues to the lack of appropriate tools for working in virtual teams. Other challenges that were mentioned included lack of trust, lack of sufficient face-to-face time and lack of appropriate leadership were also amongst the common themes.

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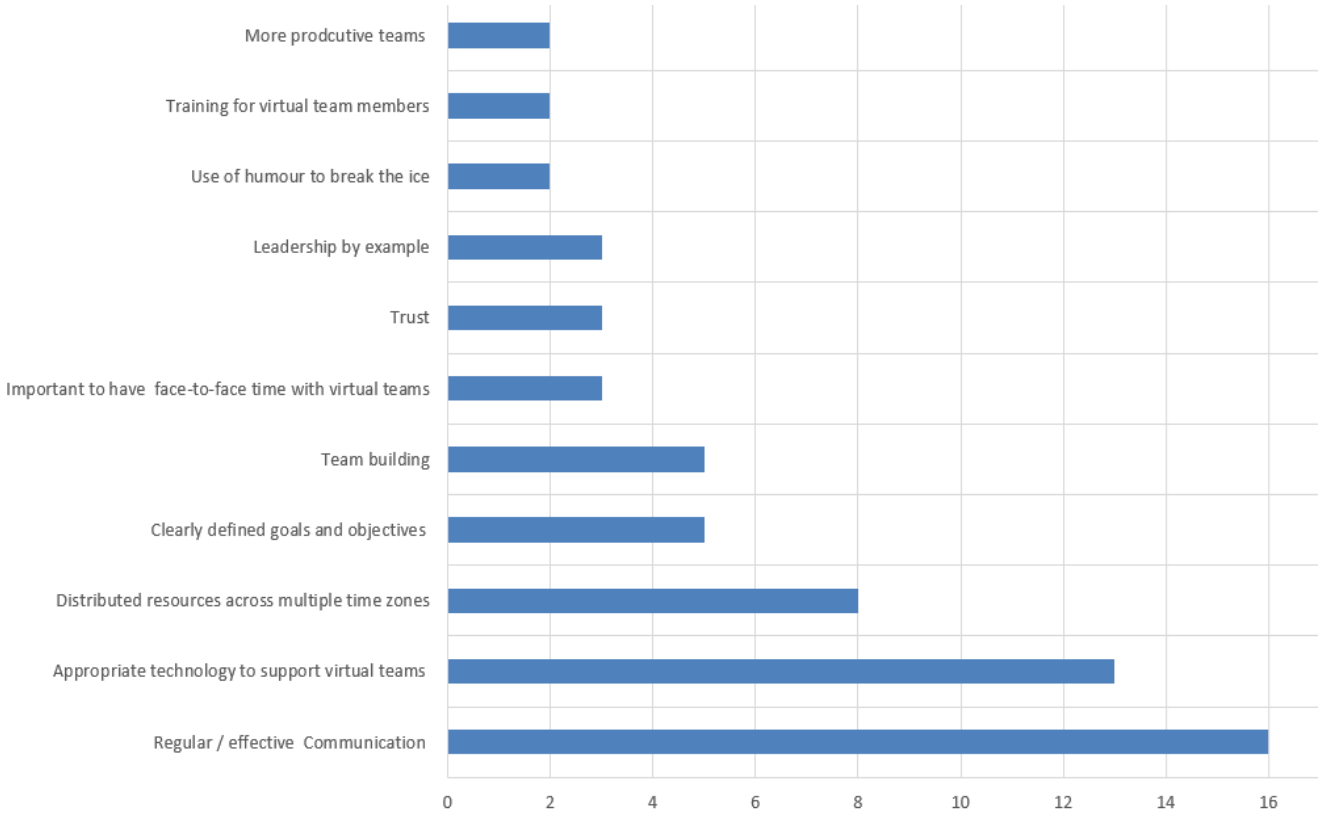
Figure 5-2 Aspects that work well in Virtual Teams



Even though communication was emphasised as a challenge, respondents also noted that regular and effective communication was a crucial factor that signified the success of their virtual teams. Technology was also listed as a vital enabler for virtual teams. The use of appropriate technology and unified communication tools were also listed as such. Working across time zones was seen as a success factor for virtual teams where support could be offered around the clock. When resources in one country went offline in the evening, another country could go online because it could have been early morning in that country. This ability to offer continuous uninterrupted support over 24 hours to organisations was seen as a significant benefit of a virtual team. Leading by example and having the right style of leadership for virtual teams also ranked as an important trait for successful virtual teams.

Clearly defined goals, objectives, roles and responsibilities were emphasised as crucial enablers for virtual teams. Team building, relationship building, the ability to meet face-to-face and building trust were highly ranked in the responses. Training for virtual team members leading to more productive teams were also listed. A few respondents suggested the use of humour to break the ice when initiating virtual teams.

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5.2.8 Challenges in virtual teams based on open-ended questions from the survey response (full list of responses in Appendix-I)

An extract from some of the verbatim responses included:

- A respondent from USA wrote “Accessibility is more important than distance. It doesn't matter where I am in the world if people can reach me. Some people have offices next door to their boss but they can't get to him. Others are separated by thousands of miles but communicate all the time. Leaders need to be accessible”.

- A respondent from USA wrote “Face time up front is absolutely critical. It is important to establish relationships and build trust. If you don't, you never recover”.

- A respondent from Guatemala wrote “Challenge: trust between teams - respect teams schedule or activities communicate quickly; find solutions instead guilty; zone time”.

- A respondent from Australia wrote “Challenges are remaining connected, ensuring communication is clear and ensuring response rates are agreed and efficient”.

- A respondent from Nigeria wrote “Challenges arises when the structure is not well defined, identification of roles and responsibilities and misinterpretation of people’s reactions will be well managed when there is a well-defined structure. There will be free flow of communication and excellent networking so that information could be central”.

- A respondent from Portugal wrote “Challenges: The time and effort that takes to build the team spirit and team belonging / Country cultural differences has to be understood as they affect someway or other the team performance”.

- A respondent from Saudi Arabia wrote “Challenges: Time zone coverage. Different cultures to address and understand. Human interface feeling and body language that has a different effect.”

- A respondent from USA wrote “Different cultures can be challenging and you have to learn how to deal with it, however there are some tools that can help address this gap. A negative factor is the lack of personal contact that could help building and strengthen the relationships among team mates”.

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- A respondent from South Africa wrote “Inability to read all the signals, body language, emotions and language barriers. The interpretation of the spoken word have different meanings in different countries and cultures”.

- A respondent from Pakistan wrote “Cultural differences, sense of motivation, conflicts among team members, Internet and bandwidth availability are some of the challenges while better networking and communication, trust among the members and proper leadership and guidance work well”.

- A respondent from USA wrote “It's important to establish a team charter and operational modalities, and ensure that team members have full access and training on virtual collaboration and communication tools”.

- A respondent from South Africa wrote “Keeping in contact over different time zones are challenging. Having a daily feedback communication via email alleviates this issue somewhat. Documenting all tasks via a weekly report keeps everyone informed work well. Assigning and dealing with issues immediately. It's important that everyone performs the tasks assigned to them as it is assigned. Change control is imperative”

- A respondent from USA wrote “Major challenge is aligning the team to a common purpose and set of goals. Must be able to recognize misalignment and address it immediately. Having clearly understood policies and processes is essential consistency and proper team function”.

- A respondent from India wrote “What doesn't work is when you have a supervisor or manager not sensitive enough to understand the specific needs of virtual teams and not really caring to make a sincere effort in establishing that important personal connect with his/her team members. Inhibitions are unfairly easier to creep in a virtual team environment if the leadership is not trained to engage people in a virtual reality environment”.

- A respondent from Malaysia wrote “The main challenge I encountered was diverging objectives being neither clearly identified, nor efficiently managed. Each person has local priorities which most of the time overtake the "virtual team” priorities. Who helps each virtual team member with this, and how”.

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5.2.9 Some aspects that work well in virtual teams based on open-ended questions from the survey response (full list of responses in Appendix-I)

An extract from some of the verbatim responses included:

- A respondent from South Africa wrote “You will always need strong independent self-starter who have loads of confidence to succeed in a remote role”
- A respondent from Kenya wrote “What works well - IM, Conference calls, Yammer, Phones equipped with all these communications mechanisms provide ways of always being in-touch with virtual teams.
- A respondent from Guatemala wrote “Work well: very clear defined process, very clear roles, clear defined project objects and scope, business training for team members to combine business knowledge with technical knowledge”.
- A respondent from Australia wrote “What works well is agreeing at the very beginning the expectations of the role and the person, not concentrating on the fact that the person is working virtually.”
- A respondent from USA wrote “Aspects that work well include Instance Messaging, Forces written communications so less subject to interpretation, Go extra mile to over-communicate”
- A respondent from Saudi Arabia wrote “Aspects will work well: Benefit of distributed resources. Lower the cost of communication to gather the team rather than face-to-face. Being virtual means be almost everywhere and anywhere, and that is a big plus”.
- A respondent from USA wrote “Virtual teams can work really well if you have at least some time dedicate to spend together in person (like events during the year, All Hands, etc.) the proper tools in place, like a good way to communicate, video to see each other and be available for your stakeholders. I really believe that there are much more benefits of working virtually than negatives”.
- A respondent from Denmark wrote “The support of top management is essential, and the business strategy must be very clear. In addition, it is salient that the manager and its members have the necessary decision mandate”.

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- A respondent from India wrote “Video Conference (Jabber) is the best thing about the virtual team management; however there should be a MOM or an email confirmation about critical/technical/business discussions to ensure everything is clear. (This is already happening, need to make sure 100%) Bandwidth can be increased to have seamless video discussions during peak hours”.

- A respondent from India wrote “Making the complete team work on a time critical delivery or 24/7 support requirement becomes easier, having folks from different time zones working on a team”.

- A respondent from South Africa wrote “Respect the differences and don’t impose narrow minded views on all teams. It’s important for all roles and responsibilities to be clearly defined and understood. It's easy to lose track of virtual team members, out of sight, out of mind. Being disciplined in regular communication using free tools, unified communication tools can help foster a virtual environment that feels much like their non-virtual counterpart”.

- A respondent from USA wrote “The key to managing the modern, mobile workforce is to truly relinquish “line of sight” control, and instead focus on cultivating teamwork, creativity, responsiveness and, ultimately, productivity. Equip your employees with the technology, resources and tools to be successful and that keep them one-step ahead. Be transparent and always communicate decisions to your team. Your expertise at virtual leadership is invaluable to your company, and something more of us will need to embrace, faster than you think”.

- A respondent from UAE wrote “Working well:

    - Team identity, taking as much time to connect informally with team members virtually as well as formally.

    - Having 1-1 as well as 1-many conversations, ensuring formal meetings are minuted, to ensure call quality or miscommunication of actions/intent can be circumvented.

    - Planning vitally important in order to synch diaries across time zones.

For a full list of all responses to the open ended questions, refer to Appendix-I (Part 1)

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5.3 Data Analysis

5.3.1 Analysis: Enablers for effective Virtual Teams

The matrix below shows the analysis for the “Enablers for Virtual teams” dataset. To reduce the number of variables in the dataset, correlations or r-value below 0.1 were excluded from the dataset. These are highlighted in yellow in the table below. To reduce the number of variables further, correlations below 0.3 or where the r-value was below 0.3 were also excluded. These items are highlighted in grey in the table below. The items that remained were all variables where the r-values were greater than 0.3 (Weiers, 2011).

As an example, “team identity” and “independent work” have an r-value of 0.339 indicating a strong association between these two variables. These items are reflected in the blocks that are not highlighted (white blocks). An extract of the Spearmen’s Correlation Matrix is provided in Appendix-Q.

Table 5-3: Correlation Matrix - Enablers for effective Virtual Teams (extracted from Appendix-J)

Correlation Matrix - Enablers for Virtual Teams							
		EnablersCommonVision	ClearRoleReponsibility	IndependentWork	ManagerDiffWorkingEnviron	DailyCheckin	TeamIdentity
Correlation	EnablersCommonVision	1.000					
	ClearRoleReponsibility	.153	1.000				
	IndependentWork	.326	.331	1.000			
	ManagerDiffWorkingEnviron	.263	.268	.375	1.000		
	DailyCheckin	.332	.150	.344	.360	1.000	
	TeamIdentity	.269	.325	.339	.444	.220	1.000
	ManagerRoleModel	.333	.267	.211	.258	.192	.430
	VirtualRelatioshipBuilding	.273	.160	.282	.226	.221	.359
	ContCoaching	.170	.299	.179	.172	.082	.194
	EngagingIntroverts	.335	.090	.385	.306	.254	.225
	FeelingCaredforbyManager	.214	.081	.208	.187	.125	.380
	UniformCOmm	.227	.188	.273	.147	.211	.249
	CelebrateSuccess	.126	.289	.118	.131	-.039	.274
	Timeforinformaldiscussion	.203	.174	.218	.204	.254	.147
	CommForums	.171	-.010	.129	.196	.260	.128
	FacetoFace2mnths	.152	.258	.251	.175	.172	.190
	r < 0.3	Can be excluded					
	r > 0.3	Indicates strong association					

The full component matrix is provided in Appendix-J which shows the component matrix for “Enablers for Virtual Teams”.

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Table 5-4: Total Variance – Enablers for effective Virtual Teams

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.206	26.286	26.286	4.206	26.286	26.286
2	1.680	10.498	36.783	1.680	10.498	36.783
3	1.320	8.249	45.033	1.320	8.249	45.033
4	1.121	7.005	52.037	1.121	7.005	52.037
5	1.024	6.398	58.435	1.024	6.398	58.435

The table above indicates the components extracted for “Enablers for Virtual Teams”. Five (5) components were extracted from ‘Enablers for Virtual Teams”, explaining 58.44% of the variance in the dataset. It shows the Eigen values for the five components extracted for the “Enablers for Virtual Teams” data set.

Table 5-5: KMO and Barlett's Test for Enablers of Virtual Teams

KMO and Bartlett's Test - Enablers for Virtual Teams		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	634.276
	df	120
	Sig.	.000

The Kaiser-Mayer-Olkin test (KMO) and the Bartlett’s test measured whether the Principle Component Analysis (PCA) is appropriate for the variables being tested. In the data set for this research, the KMO measure of sampling adequacy > 0.6 showed that the PCA was appropriate. If the significant value for this test was less than 0.05, then the null hypothesis that the correlations in the test are appropriate for the Principle Component Analysis would have been rejected (Weiers, 2011). A detailed Kaiser-Mayer-Olkin test (KMO) and the Bartlett’s test statistics are provided in Appendix-M.

The data descriptives in Appendix-R illustrates the Kurtosis and skewness of the dataset. This information simply provides an indication of whether the data is flat, peaked or skewed to the left or right (Weiers, 2011).

5.3.2 Analysis: Leadership in Virtual Teams

The matrix below shows the analysis for the “Leadership in Virtual teams” dataset. To reduce the number of variables in the dataset, correlations or r-value below 0.1 were excluded from the dataset. These are highlighted in yellow in the table below. To reduce the number of

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variables further, correlations below 0.3 or where the r-value was below 0.3 were also excluded. These items are highlighted in grey in the table below. The items that remain are all variables where the r-values were greater than 0.3.

As an example, “interpersonal” and “listening” skills had an r-value of 0.308 indicating a strong association between these two variables (Weiers, 2011). These items are reflected in the blocks that are not highlighted (white blocks). An extract of the Spearmen’s correlation Matrix is provided in Appendix-Q.

Table 5-6: Correlation Matrix - Leadership in Virtual Teams (extracted from Appendix-K)

			Correlation Matrix - Leadership						
	SkillsAnalytical	Interpersonal	Networking	MotivateExcite	TechnicalExpert	Listenining	Negotiator	InspirationalLeader	GoodDecision
SkillsAnalytical	1.000								
Interpersonal	-.042	1.000							
Networking	.250	-.068	1.000						
MotivateExcite	.193	.199	.225	1.000					
TechnicalExpert	.510	.043	.146	.224	1.000				
Listenining	.080	.308	.204	.212	.306	1.000			
Negotiator	.231	.149	.223	.145	.310	.221	1.000		
InspirationalLeader	.087	.212	.127	.293	.267	.191	.297	1.000	
GoodDecision	.436	.002	.178	.266	.514	.180	.302	.305	1.000
Coach	.055	.361	.158	.317	.082	.346	.108	.227	-.015
Aliances	.220	.074	.213	.261	.244	.079	.395	.201	.226
EnergiseInspire	.218	.164	.157	.373	.285	.269	.318	.311	.127
AttentionDetail	.248	.117	.096	.249	.344	.095	.289	.336	.358
ConcernPeople	.139	.214	.205	.246	.148	.423	.235	.140	.162
SucceedinConflictOpposition	.375	-.003	.203	.182	.373	.068	.401	.242	.359
Charamatic	.093	.314	.023	.124	.140	.278	.253	.275	.180
r < 0.3	Can be excluded								
r > 0.3	Indicates strong association								

The full component matrix is provided in Appendix-K which confirms the component matrix for “Leadership in Virtual Teams”.

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Table 5-7: Total Variance - Leadership in Virtual Teams

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.835	24.313	24.313	5.835	24.313	24.313
2	2.472	10.299	34.612	2.472	10.299	34.612
3	1.905	7.938	42.549	1.905	7.938	42.549
4	1.371	5.712	48.261	1.371	5.712	48.261
5	1.259	5.246	53.507	1.259	5.246	53.507
6	1.068	4.450	57.957	1.068	4.450	57.957
7	1.032	4.300	62.257	1.032	4.300	62.257

The table above indicates the components extracted for “Leadership in Virtual Teams” dataset. For “Leadership in Virtual Teams”, seven components were extracted explaining 62.26% of the variance in the dataset. It shows the Eigen values for the seven components extracted.

Table 5-8: KMO AND Bartlett's Test for Leadership in Virtual Teams

KMO and Bartlett's Test - Leadership in Virtual Teams		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.814
Bartlett's Test of Sphericity	Approx. Chi-Square	1318.013
	df	276
	Sig.	.000

The Kaiser-Mayer-Olkin test (KMO) and the Bartlett’s test measured whether the Principle Component Analysis (PCA) is appropriate for the variables being tested. In the data set for this research, the KMO measure of sampling adequacy > 0.6 showed that the PCA was appropriate. If the significant value for this test was less than 0.05, then the null hypothesis that the correlations in the test are appropriate for the Principle Component Analysis would be rejected (Weiers, 2011). A detailed Kaiser-Mayer-Olkin test (KMO) and the Bartlett’s test statistics are provided in Appendix-M.

The data descriptives in Appendix-R illustrates the Kurtosis and skewness of the dataset. This information simply provides an indication of whether the data is flat, peaked or skewed to the left or right (Weiers, 2011).

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5.3.3 Analysis: Unified Communication in Virtual Teams

The matrix below demonstrates the analysis for the "Unified Communication in Virtual Teams" dataset. To reduce the number of variables in the dataset, correlations or r-value below 0.1 were excluded from the dataset. These are highlighted in yellow in the table below. To reduce the number of variables further, correlations below 0.2 or where the r-value is below 0.2 were also excluded. These items are highlighted in grey in the table below. The items that remain are all variables where the r-values were greater than 0.2.

As an example, "Right technology to communicate" and "Data systems accessible to everyone" have an r-value of 0.499 indicating a strong association between these two variables. These items are reflected in the blocks that are not highlighted (white blocks). An extract of the Spearmen's correlation Matrix is provided in Appendix-Q.

Table 5-9: Correlation Matrix - Unified Communication (extracted from Appendix-L)

Correlation Matrix - Unified Communication									
		DatasystemsaccesibleEvryone	RightTecComm	UseVideoConf	UseTelecon	UseIM	UsePresenceStatus	UseElectronicWhiteBoard	UseSocialInteraction
Correlation	DatasystemsaccesibleEvryone	1.000							
	RightTecComm	.499	1.000						
	UseVideoConf	.086	.248	1.000					
	UseTelecon	.216	.257	.401	1.000				
	UseIM	.137	.223	.281	.406	1.000			
	UsePresenceStatus	.136	.212	.321	.311	.392	1.000		
	UseElectronicWhiteBoard	.180	.237	.242	.289	.259	.391	1.000	
	UseSocialInteraction	.170	.108	.056	.109	.039	.144	.178	1.000
	TrainingtouseCommTech	.204	.110	.071	.070	.058	.196	.214	.153
	UseImage	.071	.148	.022	.001	.098	.131	.173	.046

The full component matrix is provided in Appendix-L which shows the component matrix for "Unified Communication in virtual teams".

Table 5-10: Total Variance - Unified Communication in Virtual Teams

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.818	28.181	28.181	2.818	28.181	28.181
2	1.282	12.819	41.000	1.282	12.819	41.000
3	1.089	10.893	51.893	1.089	10.893	51.893

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The table above indicates the components extracted for “Unified Communication in Virtual Teams”. For ‘Unified Communication in Virtual Teams’, three components were extracted explaining 51.89% of the variance in the dataset. It shows the Eigen values for the three components extracted.

Table 5-11: KMO and Bartlett's Test for Unified Communication in Virtual Teams

KMO and Bartlett's Test - Unified Communication		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.748
Bartlett's Test of Sphericity	Approx. Chi-Square	268.307
	df	45
	Sig.	.000

The Kaiser-Mayer-Olkin test (KMO) and the Bartlett’s test measured whether the Principle Component Analysis (PCA) is appropriate for the variables being tested. In the data set for this research, the KMO measure of sampling adequacy > 0.6 showed that the PCA was appropriate. If the significant value for this test was less than 0.05, then the null hypothesis that the correlations in the test are appropriate for the Principle Component Analysis would be rejected (Weiers, 2011). A detailed Kaiser-Mayer-Olkin test (KMO) and the Bartlett’s test statistics are provided in Appendix-M.

The data descriptives in Appendix-R illustrates the Kurtosis and skewness of the dataset. This information simply provides an indication of whether the data is flat, peaked or skewed to the left or right (Weiers, 2011).

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CHAPTER 6: DISCUSSION OF RESULTS

6.1 Introduction

The findings and results of the data analysis is presented in this chapter. Survey responses were grouped into common themes and analysed with a focus on answering the research questions. The findings of the analysis suggested that unified communication is in fact a vital tool for effectively leading virtual teams. One of the key challenges facing virtual teams relate to communication and collaboration. A unified communication suite allows virtual teams to address these challenges leading to a more effective and productive team.

The analysis also suggested ideal traits, characteristics and leadership style for an effective leader of a virtual team. These included strong analytical skills, the ability to visualise and articulate and solve problems, the ability to make good decisions, being a technical expert as well as having the ability to succeed in the face of conflict and opposition. Leadership traits also included strong interpersonal skills (ability to interact with others), being a good listener, ability to coach and develop people, being charismatic, ability to energise and inspire others , concern for people, caring and support for others, having concern for human welfare, having the ability to energise and inspire others, being a skilled negotiator, having the ability to make good decisions, clear logical thinker, attention to detail, ability to build strong alliances , having imagination and creativity were all highly ranked in the survey responses.

The analysis of enablers for virtual teams suggested that the vital elements for a an effective virtual team included embedding a common vision within the team, the ability for team members to work independently, the ability to engage quiet people and introverts during conference calls, conduct daily check-in to ensure that each virtual team member clearly understands what is expected from them, clearly defined roles and responsibilities, building a strong team identity, manager being a good role model, knowing how to build a good relationship with a person without meeting them face-to-face and continuous coaching and mentoring as important contributors or enablers to successful virtual teams.

This chapter contains a detailed discussion of the data analysed with particular focus on answering the research questions. The discussion of these results is closely linked to the literature review to reflect how literature supports, rejects or supplements this research paper. This chapter links the research problem, the theory and literature review and the research questions to the data analysis to formulate a perspective regarding the research questions.

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6.2 Review of the Research Objectives

In Chapter 1, the research problem was defined. The researcher stated that the aim of this paper was to analyse the effectiveness of unified communication tools in leading virtual teams. In Chapter 2, the conflicting arguments in the academic literature regarding virtual teams and unified communication were explored and discussed. The challenges faced by virtual teams, the aspects that work well in virtual teams, the various leadership styles effective in a virtual team environment, the differences between virtual teams and face-to-face teams, the basic elements that make up a successful virtual team, communication within virtual teams and global mind-set changes required when operating in a virtual team environment we explored and discussed. Chapter 3 revealed the fundamental questions of this research that focused on the effectiveness of unified communication in leading virtual teams:

- Is unified communication an effective tool for leading virtual teams?
- Is there a specific leadership style that will suit the management of virtual teams using unified communications?
- What are the enablers for effective virtual teams?

6.3 Discussion of Results

To effectively manage virtual teams around the globe, leaders require a specialised set of communication tools (Curseu, Schalk, & Wessel, 2008). Companies support the creation of virtual teams as it produces business benefits ranging from reduced workspace costs, increased productivity, new ways of enhancing customer service, better access to global markets and environmental benefits (Horwitz, Bravington, & Silvis, 2006). Communication in virtual teams is a major challenge as virtual team members are required to make a concerted effort in active communication for the team dynamics to work (Curseu, Schalk, & Wessel, 2008). The aim of this paper is to analyse the effectiveness of unified communication tools in leading virtual teams.

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6.3.1 Results Question 1: Is unified communication an effective tool for leading virtual teams?

Table 6-1: Unified communication in virtual teams (extracted from Appendix-L)

Correlation Matrix - Unified Communication									
		DatasystemsaccesibleEvryone	RightTecComm	UseVideoConf	UseTelecon	UseIM	UsePresenceStatus	UseElectronicWhiteBoard	UseSocialInteraction
Correlation	DatasystemsaccesibleEvryone	1.000							
	RightTecComm	.499	1.000						
	UseVideoConf	.086	.248	1.000					
	UseTelecon	.216	.257	.401	1.000				
	UseIM	.137	.223	.281	.406	1.000			
	UsePresenceStatus	.136	.212	.321	.311	.392	1.000		
	UseElectronicWhiteBoard	.180	.237	.242	.289	.259	.391	1.000	
	UseSocialInteraction	.170	.108	.056	.109	.039	.144	.178	1.000
	TrainingtouseCommTech	.204	.110	.071	.070	.058	.196	.214	.153
	UseImage	.071	.148	.022	.001	.098	.131	.173	.046

Note: The blocks in white represent a strong correlation

The matrix above demonstrates the analysis for the "Unified Communication in Virtual Teams" dataset. To reduce the number of variables in the dataset, correlations or r-value below 0.1 were excluded from the dataset. To reduce the number of variables further, correlations below 0.2 or where the r-value is below 0.2 were also excluded. These items are highlighted in grey in the table above. The items that remain are all variables where the r-values were greater than 0.2. These variables where the r-value is greater than 0.2 indicate a strong association between these two variables. These items are reflected in the blocks that are not highlighted (white blocks). An extract of the Spearmen's correlation Matrix is provided in Appendix-Q.

The survey analysis for Unified Communication in Virtual Teams showed the following correlations (information extracted from Appendix-L):

Table 6-2: Unified Communication: Data Systems Accessible to all team members

	DatasystemsaccesibleEvryone
RightTecComm	.499
UseTelecon	.216
TrainingtouseCommTech	.204

- There is a strong correlation between "Data Systems accessible to everyone" and:

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- Using the right technology to communicate
- Use of tele-conferencing
- Training on how to use communication technology

This correlation implies that by having the correct data systems available to all virtual team members and by ensuring that the right technologies are available for communications (such as tele conferencing facilities) whist providing virtual team members with the correct training to use the required communication tools, could lead to an effective and successful virtual team. Interesting to note that not all components of the unified communication suite were regarded as vital when associated with the variable "Data Systems accessible to everyone". The use of instant messaging, video conferencing, user-presence and electronic whiteboards did not have a strong correlation with "Data Systems accessible to everyone" implying that only a subset of the unified communication suite was regarded as vital.

These findings are supported by Rutkowski, Vogel, van Genuchten and Saunders (2008) and Piccoli, Powell and Ives (2004) who suggested that a variety of information and technology tools are required for effective virtual teams.

Table 6-3: Unified Communication: Using the right technology to communicate

	RightTecComm
UseVideoConf	.248
UseTelecon	.257
UseIM	.223
UsePresenceStatus	.212
UseElectronicWhiteBoard	.237

- There is a strong correlation between "Using the right technology to communicate" and:

  - Use of video conferencing
  - Use of Tele-conferencing
  - Use of Instant Messenger or chat (IM)
  - Use of presence to indicate current communication status
  - Use of data sharing such as electronic whiteboards.

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This correlation implies that successful virtual teams should have the right technology to communicate such as video conferencing facilities, tele-conferencing facilities, instant messaging or chat, presence to indicate communication status and the use of electronic whiteboards for data sharing. All components of unified communication were regarded as vital when associated with the variable “Using the right technology to communicate”. These findings are supported by Aldea, Popescu, Draghici and Draghici (2012) who suggested that a range of hardware and software platforms are required by virtual team members to acquire, share, integrate and collaborate effectively.

Table 6-4: Unified Communication: Use of video conference facilities

	UseVideoConf
UseTelecon	.401
UseIM	.281
UsePresenceStatus	.321
UseElectronicWhiteBoard	.242

- There is a strong correlation between “Use of Video conferencing” and:

    - Use of tele-conferencing
    - Use of Instant Messenger or chat (IM)
    - Use of presence to indicate current communication status
    - Use of data sharing such as electronic whiteboards.

This correlation implies that virtual team members who use video conferencing facilities also use tele-conferencing facilities, instant messaging and chat, presence to indicate communication status and electronic whiteboards for data sharing. All components of unified communication were regarded as vital when associated with the variable “Use of video conferencing”. These findings are supported by Rutkowski, Vogel, van Genuchten and Saunders (2008), Piccoli, Powell and Ives (2004) and Suchan and Hayzak (2001).

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Table 6-5: Unified Communication: Use of tele-conference facilities

	UseTelecon
UseIM	.406
UsePresenceStatus	.311
UseElectronicWhiteBoard	.289

- There is a strong correlation between "Use of Tele-conferencing" and:

  - Use of Instant Messenger or chat (IM)
  - Use of presence to indicate current communication status
  - Use of data sharing such as electronic whiteboards.

This correlation implies that virtual team members who use tele conferencing facilities also use instant messaging, presence to indicate communication status and electronic whiteboards for data sharing. These findings are supported by Rutkowski, Vogel, van Genuchten and Saunders (2008), Piccoli, Powell and Ives (2004) and Suchan and Hayzak (2001) who suggested that a variety of communication and information technologies are required to make up for the lack of face-to-face communication.

6.3.1.1 Summary of findings: Unified Communication in virtual teams

The strong correlations listed above may imply that the use of the correct systems and tools, the use of right technology, the use of teleconferencing facilities, video conferencing facilities, the correct training on communication technology, the use of instant messenger or chat, IM-Presence indicating the communication status of the various team members, the use of data sharing technologies such as electronic whiteboards are all vital components for effective communication within virtual team.

In summary, the correlations listed above imply that unified communication may be a crucial component for an effective virtual team. Even though Horwitz, Bravington and Silvis (2006) state that technology provides a great mechanism for virtual teams to communicate but cannot completely replace face-to-face communication, Rutkowski, Vogel, van Genuchten and Saunders (2008); Piccoli, Powell and Ives (2004); Suchan and Hayzak (2001) and Aldea, Popescu, Draghici and Draghici (2012) in their different studies disagree and support the findings highlighted above, stating that technology is great enabler for virtual teams.

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6.3.2 Results Question 2: Is there a specific leadership style that will suit the management of virtual teams using unified communications?

Table 6-6: Leadership in virtual teams (extracted from Appendix-K)

Correlation Matrix - Leadership									
	SkillsAnalytical	Interpersonal	Networking	MotivateExcite	TechnicalExpert	Listenining	Negotiator	InspirationalLeader	GoodDecision
SkillsAnalytical	1.000								
Interpersonal	-.042	1.000							
Networking	.250	-.068	1.000						
MotivateExcite	.193	.199	.225	1.000					
TechnicalExpert	.510	.043	.146	.224	1.000				
Listenining	.080	.308	.204	.212	.306	1.000			
Negotiator	.231	.149	.223	.145	.310	.221	1.000		
InspirationalLeader	.087	.212	.127	.293	.267	.191	.297	1.000	
GoodDecision	.436	.002	.178	.266	.514	.180	.302	.305	1.000
Coach	.055	.361	.158	.317	.082	.346	.108	.227	-.015
Aliances	.220	.074	.213	.261	.244	.079	.395	.201	.226
EnergiseInspire	.218	.164	.157	.373	.285	.269	.318	.311	.127
AttentionDetail	.248	.117	.096	.249	.344	.095	.289	.336	.358
ConcernPeople	.139	.214	.205	.246	.148	.423	.235	.140	.162
SucceedinConflictOpposition	.375	-.003	.203	.182	.373	.068	.401	.242	.359
Charamatic	.093	.314	.023	.124	.140	.278	.253	.275	.180
r < 0.3	Can be excluded								
r > 0.3	Indicates strong association								

Note: The blocks in white represent strong correlation

The matrix above shows the analysis for the "Leadership in Virtual teams" dataset. To reduce the number of variables in the dataset, correlations or r-value below 0.1 were excluded from the dataset. To reduce the number of variables further, correlations below 0.3 or where the r-value was below 0.3 were also excluded. These items are highlighted in grey in the table above. The items that remain are all variables where the r-values were greater than 0.3. As an example, "interpersonal" and "listening" skills had an r-value of 0.308 indicating a strong association between these two variables (Weiers, 2011). These items are reflected in the blocks that are not highlighted (white blocks). An extract of the Spearmen's correlation Matrix is provided in Appendix-Q.

The survey analysis for Leadership in Virtual teams showed the following correlations (information extracted from Appendix-K):

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Table 6-7: Leadership: Use of Analytical Skills

	SkillsAnalytical
TechnicalExpert	.510
GoodDecision	.436
SucceedinConflictOpposition	.375

- There is a strong correlation between "Analytical skills (ability to visualise and articulate and solve problems)" and:

  - Being a technical expert
  - Ability to make good decisions
  - Ability to succeed in the face of conflict and opposition

This correlation implies that leaders of virtual teams should have strong analytical skills and should preferably be technical experts in their field. This technical background will aid virtual team leaders to deal with conflict and opposition by being able to debate and challenge views from other team members who may also consider themselves as experts in their field.

Table 6-8: Leadership: Use of Interpersonal Skills

	Interpersonal
Listenining	.308
Coach	.361
Charamatic	.314
CaringSupportOther	.473

- There is a strong correlation between "Interpersonal skills (ability to interact with others)" and:

  - Being a good listener
  - Ability to coach and develop people
  - Being charismatic
  - Caring and support for others

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This correlation implies that leaders of virtual teams should ideally possess strong interpersonal skills by being charismatic, caring and supporting team members whilst having the ability to coach and develop team members to perform at their best. These findings are supported by Parolini, Patterson and Winston (2009) who stated that the virtual team leader must be able to get in touch with other team members on an emotional level and should be able to inspire motivate and gain the respect of other team members.

Table 6-9: Leadership: Ability to motivate and excite others

	MotivateExcite
Coach	.317
EnergiseInspire	.373

- There is a strong correlation between "Ability to motivate and excite others" and:

  - Ability to coach and develop people
  - Ability to energise and inspire others.
  - Caring and support for others

This correlation implies that leaders of virtual teams should ideally possess the ability to motivate and excite their team members, be able to energise and inspire their team members whilst being able to coach and mentor them. These findings are supported by Bass, Avolio, Jung and Berson (2003) in their studies around transformational leadership.

Table 6-10: Leadership: Being a technical expert

	TechnicalExpert
Listenining	.306
Negotiator	.310
GoodDecision	.514
AttentionDetail	.344
SucceedinConflictOpposition	.373
BeingAnalyst	.319

- There is a strong correlation between "Being a technical expert" and:

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- Being a good listener
- Being a skilled negotiator
- Ability to make good decisions
- Attention to detail
- Ability to succeed in the face of conflict and opposition
- Being an analyst

There is a very strong correlation between being a technical expert and being a good decision maker suggesting that a virtual team leader must possess technical skills to be able to make the correct decisions. These technical skills will also assist the leader in dealing with conflicts and opposition. These finds are supported by Kayworth and Leidner (2002).

Table 6-11: Leadership: Being a skilled negotiator

	Negotiator
GoodDecision	.302
Aliances	.395
EnergiseInspire	.318
SucceedinConflictOpposition	.401
ToughnessAgressiv	.327

- There is a strong correlation between “Being a skilled negotiator” and:

  - Ability to make good decisions
  - Ability to build strong alliances
  - Ability to energise and inspire others.
  - Ability to succeed in the face of conflict and opposition
  - Toughness and aggressiveness

There is a strong correlation between a virtual team leader being a skilled negotiator and a leader’s ability to deal with conflict and opposition suggesting that virtual leaders must be able to handle conflicts, negotiation and opposition. The strong negotiation skills will also enable the virtual team leader to build strong alliances which is essential for the success of the virtual team. The strong correlation with ‘toughness and aggressiveness’ suggests that the virtual team leader must be able to deal with difficult discussions and confrontational situations.

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Table 6-12: Leadership: Being an inspirational leader

	InspirationalLeader
GoodDecision	.305
EnergiseInspire	.311
AttentionDetail	.336
ImaginationCreative	.383

- There is a strong correlation between "Being an inspirational leader" and:

  - Ability to make good decisions
  - Ability to energise and inspire others
  - Attention to detail
  - Imagination and creativity

The correlation highlighted above suggests that the inspirational virtual team leader must also be able to energise and inspire the virtual team members whilst having an eye for detail. These traits should enable the leader to make better decisions for the virtual team. These findings are supported by Parolini, Patterson and Winston (2009).

Table 6-13: Leadership: Attention to detail

	AttentionDetail
SucceedinConflictOpposition	.470
Charasmatic	.489
ClearLogicalThink	.336
CaringSupportOther	.384
ToughnessAgressiv	.352
ImaginationCreative	.412
BeingAnalyst	.306

- There is a strong correlation between "Attention to detail" and:

  - Ability to succeed in the face of conflict and opposition
  - Being charismatic
  - Clear, logical thinking

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- Caring and support for others
- Toughness and aggressiveness
- Imagination and creativity
- Being an analyst.

The strong correlation highlighted above suggests that the virtual team leader must enjoy great attention to detail which will provide the necessary facts to address and deal with any conflict and opposition. The correlation also suggests that a successful virtual team leader must be charismatic, clear logical thinker whilst showing care and support for others. These findings are supported by Bass, Avolio, Jung and Berson (2003); Parolini, Patterson and Winston (2009) and Hambley, O'Neill and Kline (2007).

Table 6-14: Leadership: Ability to coach and develop people

	Coach
EnergiseInspire	.419
ConcernPeople	.475
CaringSupportOther	.414
BeingHumanist	.314

- There is a strong correlation between "Ability to coach and develop people" and:

  - Ability to energise and inspire others
  - Concern for people
  - Caring and support for others
  - Being a humanist (concern for human welfare, values and dignity)

The strong correlation highlighted above suggests that the virtual team leader must enjoy strong interpersonal skills. The ability to energise and inspire others, concern for people, caring and support for others, concern for human welfare, values and dignity all suggest that the virtual team leader must possess great interpersonal skills and must be authentic to be successful in a virtual team environment.

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6.3.2.1 Summary of findings: Leadership in virtual teams

The strong correlations listed above may imply that key leadership traits for virtual teams should include strong analytical skills, the ability to visualise and articulate and solve problems, the ability to make good decisions, being a technical expert as well as having the ability to succeed in the face of conflict and opposition. Leadership traits including strong interpersonal skills (ability to interact with others), being a good listener, ability to coach and develop people, being charismatic, ability to energise and inspire others , concern for people, caring and support for others, having concern for human welfare, having the ability to energise and inspire others, being a skilled negotiator, having the ability to make good decisions, clear logical thinker, attention to detail, ability to build strong alliances , having imagination and creativity, were also strongly correlated suggesting that these traits may be important for a virtual team leader to possess.

There was also a strong correlation between “Ability to succeed in the face of conflict and opposition” and “Toughness and aggressiveness” suggesting that a passive leadership style may not be ideal in a virtual team environment. A strong correlation between “Being a humanist (concern for human welfare, values and dignity)” and “Being and networker” suggests that the leader should be authentic and influence others through good values and by being a role model.

A strong correlation between “Being a networker” and “Being a visionary (having foresight, imagination and vision)” suggests that the leader should be able to build strong relationship with others and use their input and ideas to create a vision or future goals.

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6.3.3 Results Question 3: What are the enablers for effective virtual teams?

Table 6-15: Enablers of virtual teams (extracted from Appendix-J)

Correlation Matrix - Enablers for Virtual Teams							
		EnablersCommonVision	ClearRoleReponsibility	IndependentWork	ManagerDiffWorkingEnviron	DailyCheckin	TeamIdentity
Correlation	EnablersCommonVision	1.000					
	ClearRoleReponsibility	.153	1.000				
	IndependentWork	.326	.331	1.000			
	ManagerDiffWorkingEnviron	.263	.268	.375	1.000		
	DailyCheckin	.332	.150	.344	.360	1.000	
	TeamIdentity	.269	.325	.339	.444	.220	1.000
	ManagerRoleModel	.333	.267	.211	.258	.192	.430
	VirtualRelatioshipBuilding	.273	.160	.282	.226	.221	.359
	ContCoaching	.170	.299	.179	.172	.082	.194
	EngagingIntroverts	.335	.090	.385	.306	.254	.225
	FeelingCaredforbyManager	.214	.081	.208	.187	.125	.380
	UniformCOmm	.227	.188	.273	.147	.211	.249
	CelebrateSuccess	.126	.289	.118	.131	-.039	.274
	Timeforinformaldiscussion	.203	.174	.218	.204	.254	.147
	CommForums	.171	-.010	.129	.196	.260	.128
	FacetoFace2mnths	.152	.258	.251	.175	.172	.190
	r < 0.3	Can be excluded					
	r > 0.3	Indicates strong association					

Note: The blocks in white represent strong correlation

The matrix above shows the analysis for the "Enablers for Virtual teams" dataset. To reduce the number of variables in the dataset, correlations or r-value below 0.1 were excluded from the dataset. To reduce the number of variables further, correlations below 0.3 or where the r-value was below 0.3 were also excluded. These items are highlighted in grey in the table above. The items that remained were all variables where the r-values were greater than 0.3 (Weiers, 2011).

As an example, "team identity" and "independent work" have an r-value of 0.339 indicating a strong association between these two variables. These items are reflected in the blocks that are not highlighted (white blocks). An extract of the Spearmen's Correlation Matrix is provided in Appendix-Q. The survey analysis showed the following correlations for Enablers in Virtual Teams (information extracted from Appendix-J):

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Table 6-16: Enablers of virtual teams - Embedding a common vision within the team

	EnablersCommon Vision
IndependentWork	.326
DailyCheckin	.332
ManagerRoleModel	.333
EngagingIntroverts	.335

- There is a strong correlation between “Embedding a common vision within the team” and

  - Team members being able to work independently
  - Conducting daily check-in
  - A manager being a good role model
  - Identifying and engaging quite people or introverts during conference calls.

The strong correlation highlighted above suggests a number of enablers for successful virtual teams. The correlation between embedding a common vision with team members and being able to work independently suggests that even though resources are independent and may work in different parts of the globe, alignment to a common vision is crucial for the success of the team. The ability to engage introverts in conference calls and in online discussions is also seen as an enabler for successful teams. Daily check-in may be necessary to ensure absolute alignment between team members. These findings are supported by Watkins (2013).

Table 6-17: Enablers of virtual teams - Clear defined roles and responsibility

	ClearRoleReponsibility
IndependentWork	.331
Team Identity	.325

- There is a strong correlation between “Clearly defined roles and responsibilities” and

  - Team members being able to work independently
  - Building a strong team identity.

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The correlation between clear defined roles and responsibilities and the ability of team members to work independently may lead to the creation of virtual teams with a strong team identity. These findings are supported by Desanctis and Monge (1998) and Watkins (2013).

Table 6-18: Enablers of virtual teams - Team members' ability to work independently

	IndependentWork
ManagerDiffWorkingEnviron	.375
DailyCheckin	.344
TeamIdentity	.339
EngagingIntroverts	.385

There is a strong correlation between "Team members being able to work independently" and

- Manager understanding different working environments
- Conducting daily check-in
- Building a strong team identity
- Identifying and engaging quiet people during conference calls.

The correlation suggests enablers for successful virtual teams includes understanding different working environments, different cultures and the ability to work across different time zones. These findings are supported by Oertig and Buergi (2006) who highlighted key challenges of virtual teams as projects that span across multiple nationalities, geographical distances and multiple time zones. Understanding this complexity whilst being able to work independently is a crucial success factor for the virtual team.

Table 6-19: Enablers of virtual teams - Knowing how to build a good relationship with a person without meeting them face to face

	VirtualRelatioship Building
EngagingIntroverts	.323
FeelingCaredforbyManager	.354

- There is a strong correlation between "Knowing how to build a good relationship with a person without meeting them face to face" and

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- Identifying and engaging quite people or introverts during conference calls.
- Feeling cared for by managers

The correlation suggests enablers for successful virtual teams includes understanding how to build sustainable relationships with virtual team members without meeting face-to-face. These findings are supported by Luse, McElroy, Townsend and Demarie (2013).

6.3.3.1 Summary of findings: Enablers for virtual teams

The strong correlations between “Embedding a common vision within the team” and the ability for team members to work independently, the ability to engage quiet people and introverts during conference calls and conducting daily check-in suggests that a clear vision should be communicated where each virtual team member clearly understands what is expected from them. Once this common goal is understood, the virtual team member should be able to work independently with very little supervision. Daily check-in is suggested as way to ensure alignment within the virtual team members. It is also suggested that quiet and introverted individuals should be given the opportunity to speak and engage in discussions.

The strong correlation between “Clearly defined roles and responsibilities” and “Team members being able to work independently” and “Building a strong team identity” suggests that in order to work independently in a virtual team environment, clearly defined roles and responsibilities must be communicated. This will enable virtual team members to work independently whilst creating a strong team brand and identity.

Enablers for virtual teams suggested that building a strong team identity, the virtual team manager being a good role model, knowing how to build a good relationship with a person without meeting them face-to-face and feeling cared for by managers as important contributors or enablers to successful virtual teams.

The strong correlation between “Continuous coaching on how to perform work better” and “Identifying and engaging quite people or introverts during conference calls” implies that the leader must get the best from the virtual team members. This could take the form of coaching or mentoring resources or simply engaging quiet introverted individuals during discussions to ensure that all viewpoints are heard and understood.

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There is a strong correlation between “Meeting face-to-face as a team at least once every two months” and “Properly structured communication forums”. This implies that even though technology may be used to communicate, face-to-face meetings may still be necessary.

6.4 Enablers for Successful Virtual Teams?

In his Harvard Business Review blog titled “Making Virtual Teams work: Ten basic principles”, Professor Michael Watkins listed the critical factors that ensure successful and effective virtual teams (Watkins, 2013). Professor Watkins initiated this blog on 10 June 2013 to analyse and understand the factors that make virtual teams successful as well as the factors that inhibit virtual teams. It is interesting to note that the common themes in Professor Watkins’ findings correlates to the data analysis in Chapter 5 as well as the fundamental findings of the literature review in Chapter 2.

One respondent on Watkins’ blog wrote *“I’ve run a virtual team for the past 18 months in the development and launch of a website. I am located in Toronto, Canada. The website was designed in Zagreb, Croatia. The software was developed in St. John’s, Newfoundland; Zagreb, Croatia; Delhi, India; and Los Angeles, USA. Most of the communication was via email with periodic discussions via Skype. I had one face-to-face meeting with the team lead for the technology development this past December.”* This description emphasised the extent to which virtual teams are used today and the ability to create a competitive edge for the organisation (Watkins, 2013).

Watkins (2013) received a number of responses and summarised a list of significant findings. This list ranged from meeting the team together physically early-on, defining roles, responsibilities tasks, processes and goals, commitment to a communication charter, usage of the best communication technologies available, building a consistent, regular rhythm with the virtual team, gaining mutual agreement on a shared and common language, creation of an informal and social environment conducive to sharing of information, creation of a mechanism to track commitments to creating a leadership culture of trust.

6.4.1 Face-to-face meetings

Even though virtual teams are mostly about not having face-to-face communication, the trend found in most responses is that face-to-face communication is vital, especially in the early phases of the project. Face-to-face communication is essential for building strong

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relationships and nurturing trust between the virtual team members. If face-to-face meetings are not possible, a virtual team building event is also suggested to ensure that the team members bond and become more familiar with each other. These initial sessions are vital for the team as the ground rules are agreed for the remainder of the engagement (Watkins, 2013).

6.4.2 Clearly define roles, responsibilities, tasks processes and goals

As with any project team, defining roles, responsibilities, tasks processes and goals is vital for the success of that team. In virtual teams, this is more important as the team members are not co-located and absolute alignment is vital for the success of the team. The message must be crisp and clear as every resource must have a full understanding regarding what is expected from them. Regular, periodic reviews must be scheduled to ensure that there are no misunderstandings around the goals. Any changes or adjustments needed to the roles, responsibilities, tasks, processes or goals must be implemented and tracked (Watkins, 2013).

6.4.3 Agree on a communication charter

It is interesting to note that communication challenges, misunderstanding and misinterpretation has been rated as fundamental challenges within virtual teams (Figure 5.3 - Challenges with virtual teams). It is also evident that regular, effective communication is rated as the most important contributor for effective and successful virtual teams (Figure 5.4 - Aspects that work well in virtual teams). Based on this information, communication can be easily regarded as the most critical component in a successful virtual team environment. Body language and communication cues are often misinterpreted due to cultural differences. A communication charter can aim to establish acceptable behaviour, etiquette and norms when participation is required in virtual team meetings. The charter must also include guidelines on which communication mechanism would be best suited and which medium should be used for different situations. The charter should also emphasise the need to engage all individuals in the conversation. Typically, individuals who are very vocal tend to take over a discussion, leaving little opportunity for the less vocal individuals to participate. The charter should create a mechanism that allows quiet people to engage and participate so that their views and ideas are also shared (Watkins, 2013).

6.4.4 Usage of the best communication technologies

Most information technology users have many heterogeneous communication devices such as mobile phones, pagers, Personal Digital Assistant (PDA), laptop computers, personal

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computers, slate devices as well as a variety of applications such as e-mail, instant messaging or chat-rooms. The concept behind unified communication is to integrate the various communication mechanisms in a meaningful manner so that its' users are constantly 'connected' (Wang & Katz, 2001). The use of unified communication makes communication within virtual teams and leading virtual teams easier (Watkins, 2013). Feedback from respondents stated that it is not necessary to use the latest leading edge technologies when operating in a virtual environment. However, the focus should be on reliability of the tools used and ease of use.

6.4.5 Build a consistent and regular rhythm with the team

When some or all of the members of a team are working separately, it can become all-too-easy to get disconnected from the normal rhythms of work life. One antidote is to be disciplined in creating and enforcing rhythms in virtual team work. This means, for example, having regular meetings, ideally on the same day and time each week. It also means establishing and sharing meeting agendas in advance, having clear agreements on communication protocols, and starting and finishing on time. If team members work in different time zones, do not place the entire time-zone burden on the same team members; rather, establish a regular rotation of meeting times to spread the load equitably.

6.4.6 Agree on a common language

One of the strategic contributors to successful virtual teams was the appreciation and understanding of diverse cultures (Figure 5.4 - Aspects that work well in virtual teams). Multi-cultural teams add to the complexity of leading virtual teams where communication is already a challenge. Understanding the diverse cultures is absolutely crucial to the success of a virtual team. A common language must be agreed upon to ensure that the interpretations and messages conveyed are consistent and understood by all team members. Some cultures use the English word "yes" to be polite but may not have clearly understood the task required.

6.4.7 Create an informal environment conducive for sharing of information

The creation of an informal environment conducive for information sharing is vital in any team but more so in a virtual team. Information sharing creates and reinforces social bonds. The building of trust, as well as professional and social relationships between team members creates a strong bond within the virtual team. Regular virtual team-building exercises and fun events are other ways to create strong bonds between virtual team members. Enterprise

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collaboration and social media also help the team members feel more connected to each other.

6.4.8 Clarify and track the progress on commitments

With virtual teams who are literally located around the globe, it is difficult to clearly understand and manage each resource to understand their progress on tasks assigned to them. Careful design, breakdown and assignment of tasks are crucial to the success of these teams. Regular, scheduled status checks and progress meetings can partly address this challenge. Team members need to be self-sufficient and manage their own deliverables to track and ensure progress on the tasks allocated to them. The progress and deliverables of the team must be made visible to all team members to ensure absolute collaboration between the virtual team members (Watkins, 2013).

6.4.9 Creating a leadership culture of trust

With virtual teams, trust was rated as one of the critical success factors for virtual teams (Figure 5.4 - Aspects that the leader a leader of a virtual team). With team members dispersed across the globe, an element of trust has to exist for the team to work. Team members in virtual teams are usually driven individuals who focus on delivery without much supervision (Aldea, Popescu, Draghici, & Draghici, 2012). Leaders of virtual teams need to assign responsibility to team members and trust them to deliver. Sharing leadership responsibilities across the team was also suggested by a number of respondents as this reaffirms management trust in the team and helps motivate the team members. It is vital for leaders to have one-on-one sessions with the various team members to ensure that they feel connected to the rest of the team. Coaching and guiding these individuals also increases their trust with the leadership team.

6.5 Conclusion

This chapter discussed the survey results focusing on the research questions. The three areas of focus were unified communication in virtual teams, leadership in virtual teams and enablers in virtual teams. The results showed that use of the correct systems and tools and the use of appropriate technology are crucial contributors to an effective virtual team.

The results also emphasised the significant leadership traits for virtual teams that included the leader’s ability to visualise, articulate and solve problems, the ability to make good decisions,

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being a technical expert as well as having the ability to succeed in the face of conflict and opposition, strong interpersonal skills (ability to interact with others), being a good listener, ability to coach and develop people, being charismatic, ability to energise and inspire others, concern for people, caring and support for others, having concern for human welfare, being a skilled negotiator, having the ability to make good decisions, clear logical thinker, attention to detail, ability to build strong alliances and having imagination and creativity were some of the areas emphasised in the results.

The results also stressed the importance of enablers in virtual teams. These enablers ranged from the importance of a common vision within the virtual team, the ability of team members to work independently, the ability to engage quiet people and introverts during conference calls, conducting daily check-in, clearly defined roles and responsibilities, building a strong team identity, being a good role model, knowing how to build a good relationship with a person without meeting them face-to-face, continuous coaching, and feeling cared for by managers as important contributors or enablers to successful virtual teams.

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CHAPTER 7: RECOMMENDATIONS AND CONCLUSION

7.1 Introduction

This concluding chapter emphasises the significant findings from the research in line with its main objective. It also provides recommendations from the research findings and provides high level recommendations for future research.

7.2 Summary of Objectives and Purpose of the Research

In Chapter 1, the research problem was defined and the objectives of the research were confirmed. The researcher stated that the aim of this paper was to analyse the effectiveness of unified communication tools in leading virtual teams. To set the background and context to this research paper, globalisation was defined. The impact of globalisation resulted in companies servicing customers in multiple countries throughout the world. In order to service this global customer base, virtual teams were created (Bergiel, Bergiel , & Balsmeier, 2008). To effectively manage and lead virtual teams around the globe, specialised communication tools were required (Curseu, Schalk, & Wessel, 2008). With a number of challenges experienced by virtual teams, the effectiveness of unified communication was questioned as the research objective. The scope of the research was highlighted and the research motivation was also discussed.

In Chapter 2, the conflicting arguments in the academic literature around virtual teams and unified communication were explored and discussed. The literature review discussed the challenges faced by virtual teams, the aspects that work well in virtual teams, the various leadership styles effective in a virtual team environment, transactional and transformational leadership, the differences between virtual teams and face-to-face teams, the basic elements that make up a successful virtual team, communication within virtual teams and global mind-set changes required when operating in a virtual team environment.

Chapter 3 revealed the fundamental questions of this research paper, focusing on the effectiveness of unified communication in leading virtual teams. The questions posed were:

- Is unified communication an effective tool for leading virtual teams?
- Is there a specific leadership style that will suit the management of virtual teams
- What are the enablers of virtual teams?

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Chapter 4 explained the research approach, research method and research design. The research instrument used was also discussed, and the questionnaire design and the data collection technique were demonstrated. The population and sample for the research were defined, the data analysis approach discussed and the statistical methods used to analyse the data was also covered.

Chapter 5 and Chapter 6 focused on the analysis of the survey data and the presentation of the research's findings.

7.3 Research Findings and Conclusion

In a business environment, globalisation has led to increased international competition. Companies are now competing for the same customer base irrespective of their location. Modern leaders are challenged to develop flexible organisations in response to these changes. To maintain a competitive edge, virtual teams have been created by many organisations and the popularity of virtual teams is increasing (Horwitz, Bravington, & Silvis, 2006). Virtual teams enable organisations to become more flexible by providing rapid responses to customer needs. Using the latest communication and information technology, virtual teams can consist of the best skilled resources located anywhere in the world.

As communication and information technology is a vital component for successful virtual teams, this research focused on the effectiveness of a unified communication tool for virtual teams. A unified communication tool provides a mechanism for businesses to stay ahead of their competitors.

7.3.1 Unified Communication in Virtual Teams

Unified communication and collaboration is gaining popularity. Most smartphones today allow access to e-mail, conferencing facilities, video calls and instant messaging. New hardware, together with software applications such as social networking sites, allows users to stay 'connected' and online (Aldea, Popescu, Draghici, & Draghici, 2012).

With unified communication, employees can use the method of communication that makes the most sense regardless of where they are located. They can take advantage of instant messaging, teleconferencing, video conferencing and voice capabilities and switch to a method of communication that is most feasible, based on the situation or surroundings. For example, a user could use a video conference facility but if bandwidth challenges are

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experienced, the user could simply swap to a voice conference facility (Piccoli, Powell, & Ives, 2004).

With an increase in the number of virtual teams, it was succinctly explored whether these unified communication tools alleviate some of the current communication challenges faced by virtual team leaders. Furthermore, the effectiveness of these virtual teams compared to face-to-face communication was determined, and the efficient sharing of information was concluded as imperative for virtual teams.

This research delineated that effective communication is the fundamental construct for a successful virtual team. Communication tools are essential. The use of the correct systems and tools, the use of right technology, the use of teleconferencing facilities, video conferencing facilities, the correct training on communication technology, the use of instant messenger or chat, IM-Presence indicating the communication status of the various team members, the use of data sharing technologies such as electronic whiteboards are all contributors to a successful virtual team. Aldea, Popescu, Draghici and Draghici (2012) were found to support these findings. In summary, the findings of this research paper support the use of unified communication as an effective tool for virtual teams.

7.3.2 Leadership in Virtual Teams

The research also surfaced significant leadership traits for virtual teams. Strong analytical skills, the ability to visualise and articulate and solve problems, the ability to make good decisions, being a technical expert as well as having the ability to succeed in the face of conflict and opposition were regarded as essential leadership traits for virtual team leaders. Other leadership traits included strong interpersonal skills (ability to interact with others), being a good listener, ability to coach and develop people, being charismatic, ability to energise and inspire others, concern for people, caring and support for others, having concern for human welfare, having the ability to energise and inspire others, being a skilled negotiator, having the ability to make good decisions, clear logical thinker, attention to detail, ability to build strong alliances, having imagination and creativity. Hambley, O'Neill and Kline (2007) supported these findings. In research completed by Purvanova and Bono (2009), 39 leaders who led both face-to-face and virtual teams were studied. The research revealed that the best leaders for virtual teams possessed transformational leadership qualities. Virtual team member satisfaction also increased when led by a transformational leader (Purvanova & Bono, 2009).

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7.3.3 Enablers in Virtual Teams

The research identified potential enablers for successful virtual teams. Enablers included communicating a common vision within the team, defining roles, responsibilities tasks, processes and goals, gaining mutual agreement on a shared and common language, the ability for team members to work independently, the ability to engage quiet people and introverts during conference calls, conducting daily check-ins, commitment to a communication charter, usage of the best communication technologies available, building a consistent regular rhythm with the virtual team, building a strong team and brand identity, creation of a mechanism to track commitments that create a leadership culture of trust and the creation of an informal and social environment conducive to sharing information. Enablers for virtual teams also included building a strong team identity, ensuring that the virtual team manager is a good role model, understanding how to build good relationships with team members without meeting them face-to-face, caring for team members and continuous coaching as vital contributors or enablers to successful virtual teams. These findings were supported by Watkins (2013).

7.4 Recommendations for Future Research

The primary aim of this research was to understand if unified communication is a vital tool for leading virtual teams. Further dissection by region or culture would have been appropriate, however insufficient data was collected, and thus dissection by different regions was not suitable for this study. Another perspective that could have been pursued is the research was based on industry specific data. Industries differ in their aims, objectives and culture based on their location. Thus when analysing multiple industries together these may not allow for the industry specific trends to be analysed and evaluated. A research paper focusing on particular industries may provide varying results.

This research highlighted a number of skills and traits required by virtual team members as well as virtual team leaders. Further research should be conducted on how to develop these skills in order to be effective in a virtual team environment. Talent acquisition for virtual team members will be substantially different to that of traditional teams. Human resource management, training and skills development for HR professionals to understand the complexity around virtual teams is essential to support the growth of virtual teams.

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APPENDICES

Appendix-A: Example of a Unified Collaboration Suite

- Source (http://www.techprognosis.com/unified-communications)

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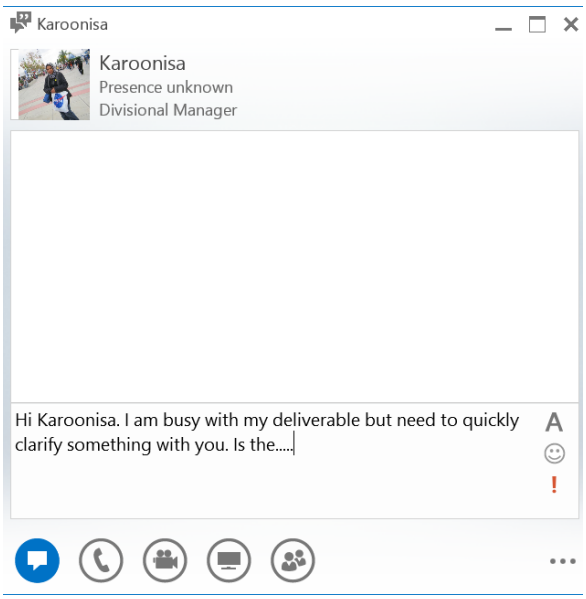
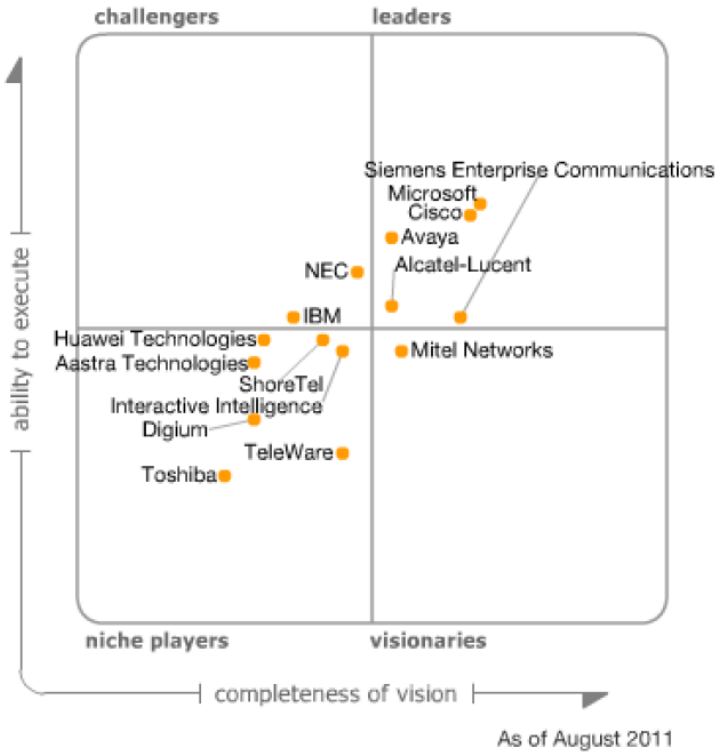
Appendix-B: Example of Instant messaging functionality



Appendix-C: Magic Quadrant for Unified Communications



Source: Gartner (August 2011)

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Appendix-D: Challenges of Virtual Teams

Type of challenge	Description
Communications	Traditional social mechanisms are lost or distorted
	Communication dynamics such as facial expressions, vocal inflections, verbal cues, and gestures are altered
	Distinctions among member's social and expert status lost or distorted
	Inhibition in building trust
	Communication process dysfunction
Culture	Potential for multiple cultures requires greater communication skills
	Unrealistic cultural expectations
	Communication may be distorted through cultural misunderstandings/biases
Logistics	Multiple time zones make scheduling meetings as well as travel very difficult
Technology	Technophobia
	Need for proficiency across a wide range of technologies
	Team membership bias toward individuals skilled at learning new technologies

(Kayworth & Leidner, 2002)

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Appendix-E: Task and Social Dynamics for Virtual Teams

Team Dynamics			Social Dynamics	
Stage	**Description**	**Task Activities**	**Description**	**Social Activities**
1	Inception	Set Goals, Generate plans, Generate Ideas	Interaction/ Inclusion	Ensure team member inclusion, Ensure opportunity for participation. Define team roles
2	Problem Solving	Select technical problems to be resolved, Solve problems with set of known answers, Solve ambiguous problems	Position status / Role definition	Address status of team members, Clarify and refine roles and expertise
3	Conflict Resolution	Resolve conflicts about different point of view, Resolve conflicts from different interests	Power/ resource Allocation	Address power difference among team members, Address interpersonal relationships, Address how different solutions affect power allocation to different functions, regions countries
4	Execution	Perform Tasks, Address organisational barriers to performance	Interaction Participation	Ensure equal participation, Ensure effective interaction and communication

Model by Duarte (2011)

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Appendix-F: Survey Instruments for Virtual Teams

Dear Colleague:

You are invited to participate in an academic research study because of your experience and knowledge in the area of interest, and within the IT industry. This study is being conducted by the Gordon Institute of Business Science (GIBS) at the University of Pretoria, South Africa. I am doing research to understand:

1) If Unified Communication is a vital tool for effective leadership when managing virtual teams?

2) What is the ideal leadership style for effectively managing virtual teams?

This research involves an anonymous survey. By completing this online questionnaire you give your consent to participate in this survey on a voluntary basis. Furthermore, you may withdraw from participation at any time, without prejudice.

Your name will not appear on the questionnaire and the answers you give will be treated as strictly confidential and will be used for academic purposes only. Data is only accessible by the researchers at the University of Pretoria, GIBS. Additionally, you cannot be identified from the answers that you provide. The questionnaire will take no longer than 15 minutes of your time to complete and has 65 questions. I thank you in advance for your kind participation. If you have any concerns, please contact me or my supervisor.

Our details are provided below:

Researcher: Ariff Nabi (ariffn@microsoft.com)

+27 (0) 82 444 2865

Supervisor: Manoj Chiba (manojchiba@gmail.com)

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Survey instrument below adapted from Mogale (2009).

Virtual teams are geographically dispersed teams who work together across time and space using information and communication technologies (Piccoli, Powell, & Ives, 2004).

1. What role do you play in a virtual team environment?

- ○ Manager
- ○ Subordinate
- ○ Both (you have a virtual subordinate and a virtual manager)

2. How long have you worked in a virtual team?

- ○ Less than 1 year
- ○ Between 1 and 3 years
- ○ Between 3 and 5 years
- ○ More than 5 years

3. In which country are you based?

4. What skills or characteristics do you regard as important for effectively managing virtual teams?

	Not important at all	Somewhat Important	Very Important	Critically Important
Analytical skills (ability to visualize, articulate and solve problems)	○	○	○	○

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	Not important at all	Somewhat Important	Very Important	Critically Important
Interpersonal skills (ability to interact with others)				
Networking skills (Developing and using contacts in business)				
Ability to excite and motivate				
Technical expert				
Good listener				
Skilled negotiator				
Inspirational leader				
Ability to make good decisions				
Ability to coach and develop people				
Ability to build strong alliances				
Ability to energise and inspire others				

5. What skills or characteristics do you regard as important for effectively managing virtual teams? (continued...)

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	Not Important at all	Somewhat Important	Very Important	Critically Important
Attention to detail				
Concern for people				
Ability to succeed in the face of conflict and opposition				
Being charismatic				
Clear, logical thinking				
Caring and support for others				
Toughness and aggressiveness				
Imagination and creativity				
Being an analyst				
Being a humanist (concern for human welfare, values, and dignity)				
Being a networker				
Being a visionary (having foresight, imagination and vision)				

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6. Enablers for Virtual Teams

	Not Important at all	Somewhat Important	Very Important	Critically Important
Embedding a common vision within the team				
Clearly defined roles and responsibilities				
Team members being able to work independently				
Manager understanding different working environments				
Conducting daily check-ins				
Building strong team identity				
A manager being a good role model				
Knowing how to build a good relationship with a person without meeting them face to face				

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	Not Important at all	Somewhat Important	Very Important	Critically Important
Continuous coaching on how to perform work better				
Identifying and engaging quiet people during conference calls				
Feeling cared for by managers				

7. Enablers for Virtual Teams continued ...

	Not Important at all	Somewhat Important	Very Important	Critically Important
Ensuring that all team members receive the same message at the same time				
Celebrating successes				
Team meetings enabling enough time to have informal discussions				
Properly structured communication forums				

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	Not Important at all	Somewhat Important	Very Important	Critically Important
Meeting face to face as a team at least once every 2 months				
Data systems accessible to everyone				
Using the right technology to communicate				
Use of Video Conferencing				
Use of Tele Conferencing				
Use of Instant Messenger or chat				

8. Enablers for Virtual Teams continued ...

	Not Important at all	Somewhat Important	Very Important	Critically Important
Use of Presence to indicate current communication status				
Use of data sharing such as electronic whiteboards				

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	Not Important at all	Somewhat Important	Very Important	Critically Important
Providing technology to enable social interaction amongst team members				
Training on how to use the available communication technology.				
Using photographs to visualise a person (e.g. an organogram)				

9. Which of these factors inhibit the effective leadership of Virtual Teams?

	Don't prevent at all	Somewhat prevent	Definitely prevent	Extensively prevent
Lack of knowledge about virtual team environment				
Not considering different time zones when setting up meetings or deadlines				
Being task driven rather than building relationships				
Inability to make decisions in the absence of a manager				

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	Don't prevent at all	Somewhat prevent	Definitely prevent	Extensively prevent
Difficulty in communicating with people from other cultures				
Availability of electronic tools to communicate				
Replacing communication over the phone with emails				
Misunderstanding instructions given				
Lack of feedback and coaching				

10. Which of these factors inhibit the effective leadership of Virtual Teams? (Continued ...)

	Don't prevent at all	Somewhat prevent	Definitely prevent	Extensively prevent
Providing feedback electronically				
Providing negative feedback over the phone				
Performance management discussions conducted via video conferencing				

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	Don't prevent at all	Somewhat prevent	Definitely prevent	Extensively prevent
Lack of trust				
Delays in resolving conflicts				
Lack of sharing knowledge and cross team learning				

11. When managing virtual teams, what are some of the challenges that you face and what are some of the aspects that work well?

Adapted from (Mogale L. , 2009)

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Appendix-G: Types of Virtual Teams (Cale, 2013)

Examples of the six types of virtual teams

TYPE	CHARACTERISTICS	EXAMPLES	DISTANCE CHALLANGES
1	Different time Same space Different culture	24 hr Teleservice 24 hr Warehouse 24x7 Factory	Cross shift interaction Multicultural interaction
2	Different time Different space Different culture	Global Teams Large Projects Large Organizations	Cross time zone interaction Multiple location interaction Multicultural interaction
3	Same time Different space Different culture	Local Sales Team Regional Services	Cross geography interaction Multicultural interaction
4	Different time Same space Same culture	24 hr Teleservice 24 hr Warehouse 24x7 Factory	Cross shift interaction
5	Different time Different space Same culture	Global Teams Large Projects Large Organizations	Cross time zone interaction Multiple location interaction
6	Same time Different space Same culture	Local Sales Team Regional Services	Cross geography interaction

(Cale, 2013)

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Appendix-H: Model for Early virtual team research (Piccoli, Powell, & Ives, 2004)

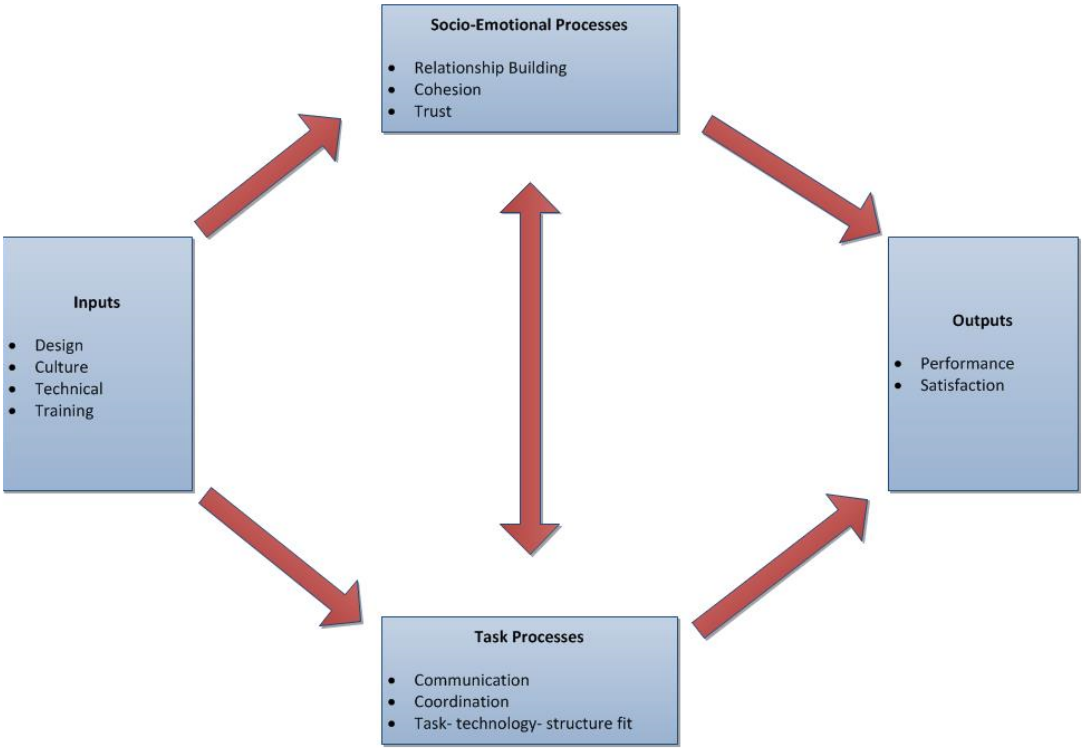

Figure: Model for Early virtual team research (Piccoli, Powell, & Ives, 2004)

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Appendix-I: (Part 1) Summary of open ended questions.

Country	When leading virtual teams, what are some of the challenges that you face and what are some of the aspects that work well.
South Africa	The most important is to define short terms objectives, train and delegate.
South Africa	1. They never really become a fully recognised member of team because the spirit and culture of team does not translate to regions. 2. Remote teams feel neglected if manager does not give them enough attention. 3. Virtual teams become demotivated if no direction and support is given to them. 4. You will always need strong independent self-starter who have loads of confidence to succeed in a remote role. What I can suggest is that what I found to always work for virtual teams is to always summarise the tasks that have to be achieved by set dates. This summary must be written and shared with the remote members of your team so that there is clarity and vision on what needs to be done by next meeting.
South Africa	A group Chat (Skype) session in which we even encourage casual conversation as well as humour works very well. A challenge is to get enough hands on deck when physical work needs to be done, e.g. physical installation of servers.
South Africa	Ability to describe problems via telephone and to collaborate on finding the solution. I find people are too quick to say "let's take it offline" or to work on their own. It is critical to maintain the conference call to work together to ensure, firstly, the problem is really understood, secondly to really dig deep into developing the solution. Ensuring contribution from all participants can be challenging as some people take over the conversation to the detriment of the solution. Time zones differences must be appreciated and a protocol should be agreed how to prevent or resolve these. Some form of response SLA would be useful. Since there is not chance to walk over to someone's desk to follow-up people need to take more accountability. The more a virtual team works together the better the performance as a rhythm can be

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	established. I think an attribute of high performing virtual teams has to be to deliver on commitments. Also, taking the time to listen to your colleagues. So much can be missed as the ability to read body language is lost.
United States	Accessibility is more important than distance. It doesn't matter where I am in the world if people can reach me. Some people have offices next door to their boss but they can't get to him. Others are separated by thousands of miles but communicate all the time. Leaders need to be accessible. Second, face time up front is absolutely critical. It is important to establish relationships and build trust. If you don't you never recover.
Austria	Effective trust required from the leader of the team whereas cognitive trust is desirable amongst the team members.
South Africa	Availability of team resources as a result of time zone. Team members not joining in calls. Network issues is also an inhibitor.
India	Below are few Challenge faced : 1. Building Relations without face to face contact even once. 2. Meeting with Offshore team in non-working hours. Things worked well: 1. Comfort and Confidence in decision taking.
Sweden	Building shared knowledge and understanding and trust in the team is critical. Start-up meeting F2F is for 1-2 days is an investment with great payoff. If you meet for only one day, make sure to make it lunch to lunch so that the evening can be utilized for social team work activity (such as cooking the dinner together).
South Africa	Challenges: ensuring line managers understand the project and its deliverables in order to allocate subordinates time correctly. Diary

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	management of the virtual team. Keeping senior management aware of status without allowing them to interfere Works Well: Electronic status updates to all members (attention to detail required.
Kenya	Challenge - Needing an electronic medium to be able to execute most Work Well - IM, Conference calls, Yammer, Phones equipped with all these communications mechanisms provide ways of always being in-touch with virtual teams.
United States	Challenge: Knowing who needs to know what information and what to address explicitly. Works well: Building relationship between me and virtual colleagues through Skype video calls, phone calls and humour and general willingness to help shared via emails.
Guatemala	Challenge: trust between teams DBAs, IT, Dev, QAetc; respect teams schedule or activities dependency (partners teams have their activities), be a trusted team for customers, review phase artefacts vs status feedback from team member; delay issues communicate quickly; find solutions instead guilty; zone time. Work well: very clear defined process, very clear roles, clear defined project objects and scope, business training for team members to combine business knowledge with technical knowledge, customer feeling trusted, weekly meeting for status review, ITIL and PM implemented, team members not group members, attend one member one by one member (listen and pay attention), training from start day before live work, Max task duration time 2

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	days, this helps to explain time required for project, and not overload work to team member. WBS agreement between PM and developer.
South Africa	Challenges - Lack of clear structured communication - Misunderstanding caused by prior prejudices Work well - after a telephonic/skype meeting put in writing what has been discussed and email to get everyone's sign-off. If possible even record the conversation. This will prevent misunderstandings later on - there should be communication done not just for the sake of work, at times individuals must be contacted for informal chats.
South Africa	Challenges: lack of compassion, care for the individual. Work well: technology, strong process orientation with clear purpose for the team (albeit through value alignment, cultural identity).
Australia	Challenges are remaining connected, ensuring communication is clear and ensuring response rates are agreed and efficient. What works well is agreeing at the very beginning the expectations of the role and the person, not concentrating on the fact that the person is working virtually.
South Africa	Challenges arise when there is conflict - but then a phone call sometimes helps resolve. Misunderstanding is a challenge. What works well is productivity - less time spent in meetings and chatting to each other.
Nigeria	Challenges arises when the structure is not well defined, identification of roles and responsibilities and misinterpretation of people's reactions will be

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	well managed when there is a well-defined structure. There will be free flow of communication and excellent networking so that information could be central.
Portugal	Challenges: The time and effort that takes to build the team spirit and team belonging / Country cultural differences has to be understood as they affect someway or other the team performance.
India	Challenges: - Access to Data shares - Unclear SLA for support teams (external) - Cultural differences Positives: - Diversity - Wider coverage (say with geographical support).
United States	Challenges: 1. Facial Communications, 2. Water cooler Informal Conversation, 3. Dilution of message as distance grows "Work well" Aspects: 1. Instance Messaging, 2. Forces written communications so less subject to interpretation, 3. Go extra mile to over-communicate
Thailand	Challenges: Communication, Cultural diversity, Commitment Positive aspect: Local knowledge / experience.
United States	Challenges: Keeping sales team members. What works well: With experienced entrepreneurs, all is working well.

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Saudi Arabia	Challenges: Time zone coverage. Different cultures to address and understand. Human interface feeling, and body language that has a different effect. Aspects will work well: Benefit of distributed resources. Lower the cost of communication to gather the team rather than face-to-face. Being virtual means be almost everywhere and anywhere, and that is a big plus.
Ireland	Challenges: Time zone difference knowing subject, lack of motivation Working well: the rest working well.
Canada	Challenges: Technical glitches, lack of high speed internet. Works well: go-to-meeting, google video chat.
Panama	Clarity And Effectiveness.
Turkey	Coming across with difficulties for communicating at the same time or because of different priorities.
South Africa	Communication is key - make sure that everybody knows status at all time.
United States	Communicating the roles of each team member, lack of commitment to the project, lack of shared vision.
Singapore	Confusion caused in task description.
South Africa	Cost of software licenses, at the office we have a drafting machine, powerful with special expensive software on, everyone can use this. Cost of sharing resources, access to expensive equipment like 3D printing. Inability to read all the signals, body language, emotions, etc.
UAE	Cultural and work boundary challenges. Respect each other's personal time.
South Africa	Cultural differences (language).

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Pakistan	Cultural differences, sense of motivation, Conflicts among team members, Internet and bandwidth availability are some of the challenges while better networking and communication, trust among the members and proper leadership and guidance work well.
Lithuania	Different attitude to work is the biggest challenge.
United States	Different cultures can be challenging and you have to learn how to deal with it, however there are some tools that can help address this gap. A negative factor is the lack of personal contact that could help building and strengthen the relationships among team mates. Virtual teams can work really well if you have at least some time dedicate to spend together in person (like events during the year, All Hands, etc.) the proper tools in place, like a good way to communicate, video to see each other and be available for your stakeholders. I really believe that there are much more benefits of working virtually than negatives.
UAE	Different language
South Africa	Difficulties: Not seeing a person to gauge non-verbal's during communications. What works well: Regular contact, especially by phone as it makes communication more personal.
Singapore	Discipline, team being aligned and/or change in an individual's ability to focus at work. Instructions given is clear and defined. And the team follows it. Open, honest communication. Ideas are shared and agree to disagree.
New Zealand	Ensuring that messages are sent and received due to a lack of body language and visual feedback workout been in the same location. Regular face to face contact is very important but can be somewhat addresses, but not replaced by video conferencing.

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Poland	First challenge is to energize global team to share knowledge with each other and not to compete, feel as a one team. It is even more challenging when you have part of your team in the office, other at home. You have to make sure the ones in their home offices should have same opportunity to join the team building events, participate in discussion, and basically have same fun at work as the ones in the office. Celebrate, celebrate, celebrate all the small successes as well as recognize often job well done.
South Africa	Getting everybody involved all the time is an art form. Usually find that there is always 10% of the audience not paying attention at any given time. This can lead to misaligned goals. I also found that working across cultural boundaries has its challenges, however these challenges if mastered will benefit all as it forces people to simplify language, avoid using slang, continuously check in on peoples understanding of ambiguous situations, and drive team collaboration.
South Africa	I think virtual teams end up being more expensive in the long run, especially if you are considering time to market for a product. The key failure is that the teams almost never meet and share time together to work onsite and socialize together. It's possible to run a good virtual team, but the team must not always be virtual and should spend at least 10% of their time together.
South Africa	I would said that the availability of resources and managers due to time zone differences can present a challenge. Also managers have to have a weekly sync with their reports to effectively know how they are tracking.
India	Immediate action can't be done. But time management is done properly.
South Africa	Internationally definitely working in an environment that has multi-cultural team members such as the Kingdom of Saudi Arabia, or multi tribal cultures such as Africa. Face to face on as regular a basis as practicality allows, but failing that Telepresence is the biggest step forward in assisting a manager in managing Virtual teams.
South Africa	It is critical that for development projects, where virtual teams are working together on a single product and require a shared vision, that they meet up for an appropriate time (typically one or two sprints) initially to build

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	relationships and rhythm. Once this is done it is not necessary for them to meet in person again unless the project is longer than a year.
United States	It's important to establish a team charter and operational modalities, and ensure that team members have full access and training on virtual collaboration and communication tools.
United States	Keeping everyone on task has been a challenge at times. Open communication and making sure that everyone understands the purpose of the team and the tasks that need to be done is critical.
South Africa	Keeping in contact over different time zones are challenging. Having a daily feedback communication via email alleviates this issue somewhat. Documenting all tasks via a weekly report keeps everyone informed work well. Assigning and dealing with issues immediately. It's important that everyone performs the tasks assigned to them as it is assigned. Change control is imperative.
India	Keeping meetings and deliverables on track by keeping all aligned and focused on deadlines.
United States	Keeping people engaged. People are busy and have varying priorities, esp. when working independently. Team contributions often fall by the wayside to "do the work" or manage their other personal and professional responsibilities on their own timelines.
Canada	Lack of face-to-face meetings therefore continually communicating electronically.
South Africa	Language barriers and understanding of instructions. Having a senior team that can work without granular management.
South Africa	Language barriers. The interpretation of the spoken word have different meanings in different countries and cultures.
United States	Last min tweaking. The ability to do last min tweaking.
South Africa	Main challenge is communication.

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Canada	Maintaining a strong corporate culture is always difficult when managing virtual teams. Clear communications and listening skills re essential.
United States	Major challenge is aligning the team to a common purpose and set of goals. Must be able to recognize misalignment and address it immediately. Having clearly understood policies and processes is essential consistency and proper team function.
India	Making the complete team work on a time critical delivery or 24/7 support requirement becomes easier, having folks from different time zones working on a team. What doesn't work is when you have a supervisor or manager not sensitive enough to understand the specific needs of virtual teams and not really caring to make a sincere effort in establishing that important personal connect with his/her team members. Inhibitions are unfairly easier to creep in a virtual team environment if the leadership is not trained to engage people in a virtual reality environment.
South Africa	Management should rather be Leadership.
Japan	Most critical is managing status on deliverables, which can be done easily with transparency on project management applications (like Trello). Other than that, there is not much difference between virtual and on-site projects.
Slovenia	Motivation, networking, well defined common vision, leader knowledge about VT.
United States	One has to build rapport amongst different cultures and have good plan/structure. Thinking on your feet and being flexible to solve problems.
South Africa	Respect the differences and don’t impose narrow minded views on all teams. It’s important for all roles and responsibilities to be clearly defined and understood. It's easy to lose track of virtual team members, out of sight, out of mind. Being disciplined in regular communication using free tools, unified communication tools can help foster a virtual environment that feels much like their non-virtual counterpart.
United States	Set clear goals and objectives, priorities, timelines, budgets, responsibilities, expectations and deliverables.

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United Kingdom	Simply realising a virtual team is every bit as relevant, powerful and empowered as a physical team.
Ireland	Some challenges are trying to connect across diverse time zones, lack of understanding of cultural differences within teams. What works well: Ability to connect quickly without having to rely on getting people face to face.
South Africa	Teams that do not meet the customer face to face, or interact with users are often too removed from the customer to deliver good value.
Canada	Technical infrastructure is set up poorly to communicate effectively. Team check in daily keeps the team close.
South Africa	Telephonic or e-mail communication makes it difficult to build trust and understanding. Face to face contact is still needed from time to time.
United States	The key to managing the modern, mobile workforce is to truly relinquish “line of sight” control, and instead focus on cultivating teamwork, creativity, responsiveness and, ultimately, productivity. Equip your employees with the technology, resources and tools to be successful and that keep them one-step ahead. Be transparent and always communicate decisions to your team. Your expertise at virtual leadership is invaluable to your company, and something more of us will need to embrace, faster than you think.
South Africa	The language barrier is a big problem, different time zones cause’s delays in processing.
Malaysia	The main challenge I encountered was diverging objectives being neither clearly identified, nor efficiently managed. Each person has local priorities which most of the time overtake the "virtual team” priorities. Who helps each virtual team member with this? And how?
South Africa	The major challenge I face is of time as there is never enough time to build a better relationship with the team as the calls are generally very structured to serve a purpose unlike if we were all sitting in a boardroom. The aspect that works well for me is that within this virtual structure it enables team members to grow and allows them full accountability on the expected deliverables without being micro management.

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South Africa	The most significant challenges faced is Time Zone and language barriers. Although English is spoken by most, accents and sentence construction often leads to confusion and misunderstanding. In extreme cases we may often need to revert to an explanation in a detailed email, not ideal but resolves is then easier to confirm understanding and correctness of the statement. Depending on Time zones the communication of an expectation and the dates associated needs to be clear, dates and times stipulated and the use of COB and end of Day, or tomorrow, needs to be defined. Meeting times and team alignment happens at odd/abnormal hours so the entire teams expectations needs to be managed to avoid future conflict or irritation as it my conflict with personal time.
Denmark	The support of top management is essential, and the business strategy must be very clear. In addition, it is salient that the manager and its members have the necessary decision mandate.
South Africa	Time zones Language barrier Cultural differences
Canada	To measure the productivity of a person. There is a network failure then to communicate. The aspects that work well is less travel time for a meeting rain or shine.
India	Video Conference (Jabber) is the best thing about the virtual team management however there should be a MOM or an email confirmation about critical/technical/business discussions to ensure everything is clear. (This is already happening, need to make sure 100%) Bandwidth can be increased to have seamless video discussions during peak hours.
South Africa	Virtual team environments are not for everyone, the challenge is trying to cultivate an ability to work with virtual teams in individuals that are not the right fit for that environment. Unidirectional focus and common goaling works well.
South Africa	When working in global teams, challenges such as time zone differences become evident. Other challenges are the inability to have a consistent shared vision and goal. Virtual teams prove very successful in being able to provide relevant resources and skills efficiently and effectively.

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UAE	Working well – 1. Team identity, taking as much time to connect informally with team members virtually as well as formally. 2. Having 1-1 as well as 1-many conversations, ensuring formal meetings are minuted, to ensure call quality or miscommunication of actions/intent can be circumvented. 3. Planning vitally important in order to synch diaries across time zones. 4. Taking time to let each person speak, creating open IM policy like an open door policy. 5. Coaching on style of IM, email communication to team members, setting management/leadership example. 6. Open respectful conversations (verbal or IM) that occur with consistency. 7. Ensuring that I find ways to bring the team together and for them to work together on initiatives that will foster team identity. 8. See people at least 2 times per year physically. Connect direct reports with local teams - so that they can feel community/sense of belonging beyond your v-team. 9. Over-communicate and share what is happening - people far away from manager feel like kept in dark often, and mostly hear many rumours - do your best to dispel that. 10. Take the same amount of time to engage with people virtually as what you would if they were physically present. Tone of voice, intent is very important when communicating bad news, or giving tough feedback - make feedback immediate. 11. Same rules as managing physical teams.

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Appendix-I: (Part 2) Number of survey responses received per country

Name of Country	No of Surveys received
South Africa	63
Country Not Specified	30
United States	30
India	22
UAE	11
Canada	9
Ireland	8
United Kingdom	4
Australia	2
Egypt	2
France	2
Kenya	2
Lebanon	2
Nigeria	2
Singapore	2
Turkey	2
Austria	1
Denmark	1
El Salvador	1
England	1
Guatemala	1
Japan	1
Lithuania	1
Malaysia	1
Namibia	1
New Zealand	1
Pakistan	1
Panama	1
Poland	1
Portugal	1
Saudi Arabia	1
Slovenia	1
Sweden	1
Thailand	1
The Netherlands	1
Trinidad & tobago	1
Total Respones received	213

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Appendix–J: Principle Component Analysis (PCA). Correlation Matrix for "Enablers for Virtual teams"

Correlation Matrix

		EnablersCommonVision	ClearRoleReponsibility	IndependentWork	ManagerDiffWorkingEnviron	DailyCheckin	TeamIdentity	ManagerRoleModel	VirtualRelationshipBuilding	ContCoaching	EngagingIntrovertS	FeelingCaredforbyManager	UniformCOmm	CelebrateSuccess	TimeforinformaldiscussIon	CommForums	FacetoFace2mnths
Correlation	EnablersCommonVision	1.000	.153	.326	.263	.332	.269	.333	.273	.170	.335	.214	.227	.126	.203	.171	.152
	ClearRoleReponsibility	.153	1.000	.331	.268	.150	.325	.267	.160	.299	.090	.081	.188	.289	.174	-.010	.258
	IndependentWork	.326	.331	1.000	.375	.344	.339	.211	.282	.179	.385	.208	.273	.118	.218	.129	.251
	ManagerDiffWorkingEnviron	.263	.268	.375	1.000	.360	.444	.258	.226	.172	.306	.187	.147	.131	.204	.196	.175
	DailyCheckin	.332	.150	.344	.360	1.000	.220	.192	.221	.082	.254	.125	.211	-.039	.254	.260	.172
	TeamIdentity	.269	.325	.339	.444	.220	1.000	.430	.359	.194	.225	.390	.249	.274	.147	.128	.190
	ManagerRoleModel	.333	.267	.211	.258	.192	.430	1.000	.376	.189	.293	.289	.280	.243	.161	.072	.121
	VirtualRelationshipBuilding	.273	.160	.282	.226	.221	.359	.376	1.000	.029	.323	.354	.130	.096	-.029	-.046	.099
	ContCoaching	.170	.299	.179	.172	.082	.194	.189	.029	1.000	.301	.012	.176	.176	.166	.180	.119
	EngagingIntrovertS	.335	.090	.385	.306	.254	.225	.293	.323	.301	1.000	.198	.210	.094	.071	.142	.104
	FeelingCaredforbyManager	.214	.081	.208	.187	.125	.380	.289	.354	.012	.198	1.000	.211	.164	.016	.147	.169
	UniformCOmm	.227	.188	.273	.147	.211	.249	.280	.130	.176	.210	.211	1.000	.103	.288	.392	.137
	CelebrateSuccess	.126	.289	.118	.131	-.039	.274	.243	.096	.176	.094	.164	.103	1.000	.035	-.026	.083
	TimeforinformaldiscussIon	.203	.174	.218	.204	.254	.147	.161	-.029	.166	.071	.016	.288	.035	1.000	.422	.238
	CommForums	.171	-.010	.129	.196	.260	.128	.072	-.046	.180	.142	.147	.392	-.026	.422	1.000	.348
	FacetoFace2mnths	.152	.258	.251	.175	.172	.190	.121	.099	.119	.104	.169	.137	.083	.238	.348	1.000

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Appendix–K: Principle Component Analysis (PCA). Correlation Matrix for "Leadership in Virtual teams" (Part 1)

		SkillsAnalytical	Interpersonal	Networking	MotivateExcite	TechnicalExpert	Listenining	Negotiator	InspirationalLeader	GoodDecision	Coach	Aliances	EnergiseInspire
Correlation	SkillsAnalytical	1.000	-.042	.250	.193	.510	.080	.231	.087	.436	.055	.220	.218
	Interpersonal	-.042	1.000	-.068	.199	.043	.308	.149	.212	.002	.361	.074	.164
	Networking	.250	-.068	1.000	.225	.146	.204	.223	.127	.178	.158	.213	.157
	MotivateExcite	.193	.199	.225	1.000	.224	.212	.145	.293	.266	.317	.261	.373
	TechnicalExpert	.510	.043	.146	.224	1.000	.306	.310	.267	.514	.082	.244	.285
	Listenining	.080	.308	.204	.212	.306	1.000	.221	.191	.180	.346	.079	.269
	Negotiator	.231	.149	.223	.145	.310	.221	1.000	.297	.302	.108	.395	.318
	InspirationalLeader	.087	.212	.127	.293	.267	.191	.297	1.000	.305	.227	.201	.311
	GoodDecision	.436	.002	.178	.266	.514	.180	.302	.305	1.000	-.015	.226	.127
	Coach	.055	.361	.158	.317	.082	.346	.108	.227	-.015	1.000	.140	.419
	Aliances	.220	.074	.213	.261	.244	.079	.395	.201	.226	.140	1.000	.379
	EnergiseInspire	.218	.164	.157	.373	.285	.269	.318	.311	.127	.419	.379	1.000
	AttentionDetail	.248	.117	.096	.249	.344	.095	.289	.336	.358	.133	.327	.276
	ConcernPeople	.139	.214	.205	.246	.148	.423	.235	.140	.162	.475	.069	.273
	SucceedinConflictOpposition	.375	-.003	.203	.182	.373	.068	.401	.242	.359	.045	.528	.220
	Charamatic	.093	.314	.023	.124	.140	.278	.253	.275	.180	.214	.199	.223
	ClearLogicalThink	.097	.273	.093	.275	.132	.234	.254	.262	.125	.181	.203	.197
	CaringSupportOther	-.017	.473	.035	.263	.078	.276	.128	.160	.035	.414	.100	.232
	ToughnessAgressiv	.155	.093	.139	.160	.288	.055	.327	.269	.319	.013	.454	.201
	ImaginationCreative	.116	.188	.047	.250	.213	.100	.218	.383	.233	.192	.187	.117
	BeingAnalyst	.187	.254	.025	.164	.319	.252	.141	.233	.258	.244	.066	.124
	BeingHumanist	.274	.058	.159	.152	.131	.109	.165	.189	.250	.314	.137	.181
	BeingNetworker	.227	.021	.132	.100	.020	.067	.100	.050	.107	.216	.057	.086
	BeingVisionary	.131	.032	.141	.198	.031	.117	.101	.064	.026	.237	.115	.098

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Appendix–K: Principle Component Analysis (PCA). Correlation Matrix for “Leadership in Virtual teams” (Part 2)

		AttentionDetail	ConcernPeople	SucceedinConflictOpposition	Charamatic	ClearLogicalThink	CaringSupportOthers	ToughnessAgressive	ImaginationCreative	BeingAnalyst	BeingHumanist	BeingNetworker	BeingVisionary
Correlation	SkillsAnalytical	.248	.139	.375	.093	.097	-.017	.155	.116	.187	.274	.227	.131
	Interpersonal	.117	.214	-.003	.314	.273	.473	.093	.188	.254	.058	.021	.032
	Networking	.096	.205	.203	.023	.093	.035	.139	.047	.025	.159	.132	.141
	MotivateExcite	.249	.246	.182	.124	.275	.263	.160	.250	.164	.152	.100	.198
	TechnicalExpert	.344	.148	.373	.140	.132	.078	.288	.213	.319	.131	.020	.031
	Listenining	.095	.423	.068	.278	.234	.276	.055	.100	.252	.109	.067	.117
	Negotiator	.289	.235	.401	.253	.254	.128	.327	.218	.141	.165	.100	.101
	InspirationalLeader	.336	.140	.242	.275	.262	.160	.269	.383	.233	.189	.050	.064
	GoodDecision	.358	.162	.359	.180	.125	.035	.319	.233	.258	.250	.107	.026
	Coach	.133	.475	.045	.214	.181	.414	.013	.192	.244	.314	.216	.237
	Aliances	.327	.069	.528	.199	.203	.100	.454	.187	.066	.137	.057	.115
	EnergiseInspire	.276	.273	.220	.223	.197	.232	.201	.117	.124	.181	.086	.098
	AttentionDetail	1.000	.225	.470	.489	.336	.384	.352	.412	.306	.178	-.014	-.020
	ConcernPeople	.225	1.000	.175	.254	.400	.427	.026	.248	.304	.202	.041	.257
	SucceedinConflictOpposition	.470	.175	1.000	.258	.202	.174	.586	.200	.114	.274	.162	.080
	Charamatic	.489	.254	.258	1.000	.414	.397	.238	.334	.302	.135	.075	-.015
	ClearLogicalThink	.336	.400	.202	.414	1.000	.514	.173	.361	.357	.074	-.112	.156
	CaringSupportOther	.384	.427	.174	.397	.514	1.000	.144	.251	.354	.081	.025	.104
	ToughnessAgressiv	.352	.026	.586	.238	.173	.144	1.000	.258	.125	.128	.124	-.060
	ImaginationCreative	.412	.248	.200	.334	.361	.251	.258	1.000	.344	.122	.064	.161
	BeingAnalyst	.306	.304	.114	.302	.357	.354	.125	.344	1.000	.123	-.004	-.007
	BeingHumanist	.178	.202	.274	.135	.074	.081	.128	.122	.123	1.000	.413	.219
	BeingNetworker	-.014	.041	.162	.075	-.112	.025	.124	.064	-.004	.413	1.000	.302
	BeingVisionary	-.020	.257	.080	-.015	.156	.104	-.060	.161	-.007	.219	.302	1.000

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Appendix–L: Principle Component Analysis (PCA). Correlation Matrix for "Unified Communication"

Correlation Matrix

		DatasystemsaccessibleEvryone	RightTecComm	UseVideoConf	UseTelecon	UseIM	UsePresenceStatus	UseElectronicWhiteBoard	UseSocialInteraction	TrainingtouseCommTech	UseImage
Correlation	DatasystemsaccessibleEvryone	1.000	.499	.086	.216	.137	.136	.180	.170	.204	.071
	RightTecComm	.499	1.000	.248	.257	.223	.212	.237	.108	.110	.148
	UseVideoConf	.086	.248	1.000	.401	.281	.321	.242	.056	.071	.022
	UseTelecon	.216	.257	.401	1.000	.406	.311	.289	.109	.070	.001
	UseIM	.137	.223	.281	.406	1.000	.392	.259	.039	.058	.098
	UsePresenceStatus	.136	.212	.321	.311	.392	1.000	.391	.144	.196	.131
	UseElectronicWhiteBoard	.180	.237	.242	.289	.259	.391	1.000	.178	.214	.173
	UseSocialInteraction	.170	.108	.056	.109	.039	.144	.178	1.000	.153	.046
	TrainingtouseCommTech	.204	.110	.071	.070	.058	.196	.214	.153	1.000	.083
	UseImage	.071	.148	.022	.001	.098	.131	.173	.046	.083	1.000

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Appendix–M: Kaiser-Meyer-Olkin (KMO) and Bartlett's test statistics

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	634.276
	df	120
	Sig.	.000

KMO and Bartlett's Test for "Enablers for Virtual Teams"

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.814
Bartlett's Test of Sphericity	Approx. Chi-Square	1318.013
	df	276
	Sig.	.000

KMO and Bartlett's Test for "Leadership in Virtual Teams"

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.748
Bartlett's Test of Sphericity	Approx. Chi-Square	268.307
	df	45
	Sig.	.000

KMO and Bartlett's Test for Unified Communication

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Appendix–N: Component Matrix (Enablers for Virtual Teams)

Component Matrix - Enablers for Virtual Teams					
	Component				
	1	2	3	4	5
EnablersCommonVision	.578	-.020	-.223	-.139	.173
ClearRoleReponsibility	.488	-.106	.571	-.152	-.292
IndependentWork	.640	-.001	-.070	-.287	-.212
ManagerDiffWorkingEnviron	.607	-.017	-.053	-.233	-.299
DailyCheckin	.524	.225	-.370	-.264	-.223
TeamIdentity	.665	-.270	.101	.193	-.145
ManagerRoleModel	.600	-.292	.045	.173	.227
VirtualRelationshipBuilding	.497	-.482	-.330	.075	-.044
ContCoaching	.396	.115	.451	-.349	.428
EngagingIntroverts	.551	-.120	-.240	-.361	.372
FeelingCaredForByManager	.463	-.282	-.230	.548	.000
UniformComm	.512	.292	.004	.283	.362
CelebrateSuccess	.316	-.313	.567	.188	.092
TimeForInformalDiscussion	.410	.597	.113	.060	-.024
CommForums	.394	.690	-.094	.283	.133
FacetoFace2mnths	.416	.324	.146	.219	-.414
Extraction Method: Principal Component Analysis.					
5 components extracted.					

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Total Variance Explained - Enablers for Virtual Teams

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.206	26.286	26.286	4.206	26.286	26.286
2	1.680	10.498	36.783	1.680	10.498	36.783
3	1.320	8.249	45.033	1.320	8.249	45.033
4	1.121	7.005	52.037	1.121	7.005	52.037
5	1.024	6.398	58.435	1.024	6.398	58.435
6	.867	5.421	63.856			
7	.789	4.933	68.789			
8	.756	4.727	73.516			
9	.722	4.509	78.026			
10	.612	3.828	81.853			
11	.597	3.734	85.587			
12	.564	3.528	89.115			
13	.502	3.140	92.255			
14	.468	2.924	95.178			
15	.399	2.497	97.675			
16	.372	2.325	100.000			

Extraction Method: Principal Component Analysis. Indicates the components extracted for “enablers in Virtual Teams”. 5 Components were extracted explaining 58.44% of the variance in the dataset.

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Appendix–O: Component Matrix (Leadership in Virtual Teams)

Component Matrix - Leadership in Virtual Teams

	Component						
	1	2	3	4	5	6	7
SkillsAnalytical	.436	-.453	.233	-.383	.061	.044	.121
Interpersonal	.371	.523	-.101	.096	-.004	-.365	.036
Networking	.317	-.193	.355	-.021	-.313	.312	.094
MotivateExcite	.516	.076	.187	.021	-.216	.095	-.478
TechnicalExpert	.545	-.360	-.053	-.486	-.158	-.139	-.014
Listenining	.457	.312	.182	-.283	-.323	-.186	.230
Negotiator	.553	-.225	-.032	.140	-.196	.011	.162
InspirationalLeader	.541	-.012	-.120	.034	.018	-.188	-.522
GoodDecision	.520	-.428	-.046	-.413	.087	-.051	-.082
Coach	.477	.471	.417	.109	-.069	-.212	-.055
Aliances	.517	-.349	-.056	.446	-.257	.060	.018
EnergiseInspire	.544	.034	.180	.181	-.424	-.243	-.160
AttentionToDetail	.645	-.113	-.364	.039	.170	.065	.001
ConcernPeople	.535	.399	.224	-.161	-.089	.274	.233
SucceedinConflictOpposition	.593	-.484	-.099	.256	.059	.074	.250
Charasmatic	.557	.220	-.310	.103	.217	-.113	.220
ClearLogicalThinker	.556	.342	-.257	.021	.024	.416	.057
CaringSupportOthers	.529	.546	-.149	.111	.072	.064	.199
ToughnessAgressive	.498	-.400	-.269	.344	.028	-.113	.083
ImaginationCreative	.529	.099	-.221	-.012	.349	.218	-.383
BeingAnalyst	.493	.239	-.209	-.424	.198	-.042	.016
BeingHumanist	.393	-.127	.473	.052	.417	-.195	.066
BeingNetworker	.204	-.146	.588	.178	.471	-.227	.084
BeingVisionary	.232	.102	.554	.119	.183	.448	-.132

Extraction Method: Principal Component Analysis.
7 components extracted.

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Total Variance Explained - Leadership in Virtual Teams

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.835	24.313	24.313	5.835	24.313	24.313
2	2.472	10.299	34.612	2.472	10.299	34.612
3	1.905	7.938	42.549	1.905	7.938	42.549
4	1.371	5.712	48.261	1.371	5.712	48.261
5	1.259	5.246	53.507	1.259	5.246	53.507
6	1.068	4.450	57.957	1.068	4.450	57.957
7	1.032	4.300	62.257	1.032	4.300	62.257
8	.899	3.747	66.004			
9	.823	3.431	69.435			
10	.790	3.290	72.724			
11	.694	2.892	75.616			
12	.660	2.748	78.364			
13	.652	2.718	81.082			
14	.566	2.359	83.441			
15	.549	2.286	85.726			
16	.538	2.244	87.970			
17	.493	2.053	90.022			
18	.441	1.837	91.860			
19	.408	1.702	93.561			
20	.377	1.569	95.131			
21	.352	1.466	96.597			
22	.291	1.212	97.809			
23	.280	1.167	98.976			
24	.246	1.024	100.000			

Extraction Method: Principal Component Analysis. Indicates the components extracted for “Leadership in Virtual Teams”. 7 Components were extracted explaining 62.26% of the variance in the dataset.

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Appendix–P: Component Matrix (Unified Communication in Virtual Teams)

Component Matrix - Unified Communications			
	Component		
	1	2	3
DatasystemsaccesibleEveryone	.501	.548	-.478
RightTechComm	.598	.329	-.481
UseVideoConf	.568	-.406	-.102
UseTelecon	.650	-.341	-.204
UseIM	.607	-.384	-.008
UsePresenceStatus	.662	-.198	.320
UseElectronicWhiteBoard	.628	.032	.345
UseSocialInteraction	.301	.386	.241
TrainingtouseCommTech	.340	.431	.377
UseImage	.239	.262	.395
Extraction Method: Principal Component Analysis.			
3 components extracted.			

Total Variance Explained - Unified Communiction in Virtual Teams						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.818	28.181	28.181	2.818	28.181	28.181
2	1.282	12.819	41.000	1.282	12.819	41.000
3	1.089	10.893	51.893	1.089	10.893	51.893
4	.997	9.969	61.862			
5	.848	8.477	70.339			
6	.727	7.270	77.609			
7	.674	6.743	84.352			
8	.616	6.157	90.509			
9	.508	5.078	95.587			
10	.441	4.413	100.000			
Extraction Method: Principal Component Analysis.						

Extraction Method: Principal Component Analysis. Indicates the components extracted for “Unified Communication in Virtual Teams”. 3 Components were extracted explaining 51.89% of the variance in the dataset.

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Appendix–Q: Extract of Spearman's Correlation Matrix

			SkillsAnalytical	Interpersonal	Networking	MotivateExcite	TechnicalExpert	Listenining	Negotiator	InspirationalLeader	GoodDecision	Coach	Aliances	EnergiseInspire
Spearman's rho	SkillsAnalytical	Correlation Coefficient	1.000	.005	.242**	.239**	.532**	.131	.235**	.162*	.449**	.057	.224**	.280**
		Sig. (2-tailed)		.949	.001	.001	.000	.067	.001	.023	.000	.427	.002	.000
		N	197	197	197	196	196	197	197	197	197	194	193	192
	Interpersonal	Correlation Coefficient	.005	1.000	-.098	.178*	.054	.280**	.148*	.202**	.008	.354**	.076	.171*
		Sig. (2-tailed)	.949		.170	.013	.454	.000	.037	.004	.906	.000	.295	.018
		N	197	198	198	196	197	198	198	198	198	195	194	193
	Networking	Correlation Coefficient	.242**	-.098	1.000	.212**	.135	.192**	.230**	.171*	.231**	.157*	.210**	.198**
		Sig. (2-tailed)	.001	.170		.003	.058	.007	.001	.016	.001	.028	.003	.006
		N	197	198	198	196	197	198	198	198	198	195	194	193
	MotivateExcite	Correlation Coefficient	.239**	.178*	.212**	1.000	.273**	.193**	.149*	.293**	.296**	.280**	.269**	.399**
		Sig. (2-tailed)	.001	.013	.003		.000	.007	.037	.000	.000	.000	.000	.000
		N	196	196	196	196	195	196	196	196	196	193	193	191
	TechnicalExpert	Correlation Coefficient	.532**	.054	.135	.273**	1.000	.306**	.329**	.295**	.509**	.080	.245**	.284**
		Sig. (2-tailed)	.000	.454	.058	.000		.000	.000	.000	.000	.267	.001	.000
		N	196	197	197	195	197	197	197	197	197	194	193	192
	Listenining	Correlation Coefficient	.131	.280**	.192**	.193**	.306**	1.000	.239**	.223**	.206**	.357**	.080	.261**
		Sig. (2-tailed)	.067	.000	.007	.007	.000		.001	.002	.004	.000	.269	.000
		N	197	198	198	196	197	198	198	198	198	195	194	193
	Negotiator	Correlation Coefficient	.235**	.148*	.230**	.149*	.329**	.239**	1.000	.313**	.311**	.084	.401**	.319**
		Sig. (2-tailed)	.001	.037	.001	.037	.000	.001		.000	.000	.246	.000	.000
		N	197	198	198	196	197	198	198	198	198	195	194	193
	InspirationalLeader	Correlation Coefficient	.162*	.202**	.171*	.293**	.295**	.223**	.313**	1.000	.386**	.194**	.176*	.350**
		Sig. (2-tailed)	.023	.004	.016	.000	.000	.002	.000		.000	.007	.014	.000
		N	197	198	198	196	197	198	198	198	198	195	194	193

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Appendix–R: Extract of Descriptives

Descriptives			Statistic	Std. Error
SkillsAnalytical	Mean		3.36	.052
	95% Confidence Interval for Mean	Lower Bound	3.26	
		Upper Bound	3.46	
	5% Trimmed Mean		3.40	
	Median		3.00	
	Variance		.423	
	Std. Deviation		.651	
	Minimum		2	
	Maximum		4	
	Range		2	
	Interquartile Range		1	
	Skewness		-.523	.193
	Kurtosis		-.669	.384
Interpersonal	Mean		2.41	.068
	95% Confidence Interval for Mean	Lower Bound	2.28	
		Upper Bound	2.55	
	5% Trimmed Mean		2.40	
	Median		2.00	
	Variance		.741	
	Std. Deviation		.861	
	Minimum		1	
	Maximum		4	
	Range		3	
	Interquartile Range		1	
	Skewness		.248	.193
	Kurtosis		-.547	.384

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Descriptives				
			Statistic	Std. Error
Networking	Mean		3.53	.046
	95% Confidence Interval for Mean	Lower Bound	3.44	
		Upper Bound	3.62	
	5% Trimmed Mean		3.58	
	Median		4.00	
	Variance		.340	
	Std. Deviation		.583	
	Minimum		2	
	Maximum		4	
	Range		2	
	Interquartile Range		1	
	Skewness		-.808	.193
	Kurtosis		-.324	.384
MotivateExcite	Mean		3.08	.060
	95% Confidence Interval for Mean	Lower Bound	2.96	
		Upper Bound	3.19	
	5% Trimmed Mean		3.09	
	Median		3.00	
	Variance		.567	
	Std. Deviation		.753	
	Minimum		1	
	Maximum		4	
	Range		3	
	Interquartile Range		1	
	Skewness		-.217	.193
	Kurtosis		-.936	.384

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Appendix–S: Kolmogorov-Smirnov and Shapiro-Wilk test for Normality

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SkillsAnalytical	.293	158	.000	.760	158	.000
Interpersonal	.266	158	.000	.866	158	.000
Networking	.365	158	.000	.698	158	.000
MotivateExcite	.226	158	.000	.822	158	.000
TechnicalExpert	.236	158	.000	.808	158	.000
Listenining	.278	158	.000	.766	158	.000
Negotiator	.265	158	.000	.792	158	.000
InspirationalLeader	.279	158	.000	.786	158	.000
GoodDecision	.325	158	.000	.709	158	.000
Coach	.271	158	.000	.813	158	.000
Aliances	.305	158	.000	.783	158	.000
EnergiseInspire	.286	158	.000	.770	158	.000
AttentionDetail	.230	158	.000	.860	158	.000
ConcernPeople	.266	158	.000	.782	158	.000
SucceedinConflictOpposition	.285	158	.000	.816	158	.000
Charamatic	.262	158	.000	.847	158	.000
ClearLogicalThink	.276	158	.000	.837	158	.000
CaringSupportOthers	.232	158	.000	.871	158	.000
ToughnessAgressive	.241	158	.000	.809	158	.000
ImaginationCreative	.244	158	.000	.845	158	.000
BeingAnalyst	.264	158	.000	.829	158	.000
BeingHumanist	.367	158	.000	.698	158	.000
BeingNetworker	.399	158	.000	.651	158	.000
BeingVisionary	.328	158	.000	.741	158	.000
EnablersCommonVision	.322	158	.000	.739	158	.000
ClearRoleReponsibility	.224	158	.000	.877	158	.000
IndependentWork	.297	158	.000	.789	158	.000
ManagerDiffWorkingEnviron	.283	158	.000	.785	158	.000
DailyCheckin	.377	158	.000	.694	158	.000
TeamIdentity	.258	158	.000	.821	158	.000
ManagerRoleModel	.262	158	.000	.821	158	.000
VirtualRelatioshipBuilding	.274	158	.000	.834	158	.000

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Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ContCoaching	.222	158	.000	.836	158	.000
EngagingIntroverts	.317	158	.000	.764	158	.000
FeelingCaredforbyManager	.289	158	.000	.827	158	.000
UniformCOmm	.317	158	.000	.772	158	.000
CelebrateSuccess	.286	158	.000	.848	158	.000
Timeforinformaldiscussion	.283	158	.000	.783	158	.000
CommForums	.357	158	.000	.700	158	.000
FacetoFace2mnths	.211	158	.000	.853	158	.000
DatasystemsaccesibleEvryone	.265	158	.000	.800	158	.000
RightTecComm	.224	158	.000	.832	158	.000
UseVideoConf	.291	158	.000	.845	158	.000
UseTelecon	.223	158	.000	.859	158	.000
UseIM	.205	158	.000	.838	158	.000
UsePresenceStatus	.269	158	.000	.840	158	.000
UseElectronicWhiteBoard	.235	158	.000	.870	158	.000
UseSocialInteraction	.245	158	.000	.846	158	.000
TrainingtouseCommTech	.258	158	.000	.783	158	.000
UseImage	.243	158	.000	.851	158	.000
InhibitingFactorsLackofKnowl	.322	158	.000	.813	158	.000
DiffTimeZone	.249	158	.000	.809	158	.000
TaskDrivenRelationBuildiung	.260	158	.000	.814	158	.000
DecisionWithoutManager	.242	158	.000	.869	158	.000
CommDiffCultures	.269	158	.000	.793	158	.000
AvailabilityElecTools	.236	158	.000	.814	158	.000
UseofEmailforComm	.223	158	.000	.860	158	.000
MisunderstandingInstructions	.252	158	.000	.862	158	.000
LackofFeedbackCoaching	.240	158	.000	.822	158	.000
ProvidingFeedbackElectronically	.370	158	.000	.695	158	.000
ProvidingNegativeFeedbackTelephone	.281	158	.000	.776	158	.000
PerformanceManagementVideoCon	.232	158	.000	.821	158	.000
LackTrust	.370	158	.000	.695	158	.000
DelayResolveConflict	.281	158	.000	.776	158	.000
LackofKnowlSharingCrossTeamLearning	.232	158	.000	.821	158	.000

a. Lilliefors Significance Correction

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