

An Analysis of the Knowledge Management Systems in an Organization with a Center-Periphery Knowledge Management Landscape

by
Ratidzo Dube

Thesis presented in fulfilment of the requirements for the degree of *Master of Philosophy (Information and Knowledge Management)* in the Faculty of Arts and Social Sciences at Stellenbosch University



Supervisor: Mr. C. Maasdorp
March 2017

DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: March 2017

Copyright © 2017 Stellenbosch University

All rights reserved

SUMMARY

The thesis is an analysis of the knowledge management systems in AIDORG¹ as a prominent example of an organization with a center-periphery knowledge management landscape. Typically such a landscape involves a central head office, the locus of policy and funding, and various peripheral field offices, the loci of projects and practices.

A review of the literature on knowledge management systems, in particular in multi-national organizations, showed that to realize the benefits of knowledge management in the organization, an inclusive view of the knowledge management system is needed that goes further than merely technological aspects to also include cultural, managerial and organizational ones. Two views of knowledge managements are introduced, namely practice and content (possession) view. It is argued that a possession view of knowledge management is usually primarily technology focused, whilst a practice based view tends to include more organizational aspects.

Thereafter the knowledge management system at AIDORG is described in terms of Becerra-Fernandez's knowledge management framework. Through participant observation and a user survey, the actual operation of the knowledge management system at AIDORG is revealed. It was found that even though the organization has invested a lot in the knowledge management system, it is not particularly effective in terms of periphery participation in the system. The center is using the knowledge management system more consistently than the periphery and whilst there are technological infrastructure and tools available for periphery participation in the knowledge management system, the character of periphery participation is mostly directed at knowledge discovery and application, rather than creation and sharing.

Taken together, the design of the knowledge management system is to facilitate the movement of information and decisions from the center towards the periphery and is marked by scant consideration of the practices and their associated knowledge management problems at the periphery. It is concluded that, since the periphery is where the organization's practices are embedded, a knowledge management approach with a practice perspective could encourage fuller and more rounded periphery participation in knowledge management and might lead to the desired two way interaction between center and periphery. The notion of communities of practice is identified as a possible starting point for redressing the balance in center-periphery knowledge management landscapes.

¹ AIDORG is a pseudonym for a large aid organization

OPSOMMING

Die tesis is 'n analise van die kennisbestuurstelsel van AIDORG as 'n prominente voorbeeld van 'n organisasie met 'n sentrum-periferie kennisbestuurslandskap. Tipies bestaan so 'n landskap uit 'n sentrale hoofkantoor, die lokus van beleid en befondsing, en verskeie takkantore op die periferie, die loki van projekte en praktyke.

In 'n literatuuroorsig van kennisbestuurstelsel, inbesondere multinasionale organisasies, word gedemonstreer dat 'n inklusiewe siening van kennisbestuurstelsels wat kulturele-, bestuurs-, en organisatoriese-aspekte met die tegnologiese aspekte saamdink, 'n vereiste is om die volle voordele van 'n kennisbestuurstelsel te realiseer. Twee sienings van kennisbestuur, die een gerig op praktyke en die ander op inhoud word gekontrasteer en daarop gewys dat die inhoudsgerigte siening gewoonlik meer tegnologies gefokus is, terwyl die praktykgerigte siening gewoonlik ook die ander organisatoriese elemente insluit.

Daarna word die gevallestudie van AIDORG beskryf deur die kennisbestuursstelsel in terme van Becerra-Fernandez se kennisbestuursraamwerk uit te pak. Deur deelnemende observasie en 'n gebruikersvraelys, word die werkswyse van die kennisbestuurstelsel in die praktyk ontbloot. Daar is gevind dat alhoewel die organisasie baie in die kennisbestuurstelsel investeer het, die stelsel nie werklik effektief is in terme van perifere deelname in die stelsel nie. Die sentrum gebruik die stelsel meer as die periferie en alhoewel daar tegnologiese infrastruktuur beskikbaar is vir periferie deelname, word sulke deelname gekarakteriseer deur kennis-ontdekking en kennis-toepassing, eerder as kennis-skepping en kennis-deling.

Saamgevat, die ontwerp van die kennisbestuurstelsel is hoofsaaklik om die beweging van informasie en besluite vanaf die sentrum na die periferie te ondersteun en dit word gekenmerk deur geen oorweging van die praktyke en gepaardgaande kennisbestuursprobleme in die periferie nie. Omdat die periferie is waar die organisasie se praktyke ingebed is, is die gevolgtrekking dat 'n praktykgerigte kennisbestuursbenadering waarskynlik groter en meer volronde periferie deelname sal aanmoedig en dalk kan lei tot gewenste tweerigting interaksie tussen sentrum en periferie. Die idee van praktykgemeenskappe is geïdentifiseer as 'n moontlike aanknopingspunt om die balans in die sentrum-periferie kennisbestuurslandskap te herstel.

ACKNOWLEDGEMENTS

It feels so good to finally write this page, and I will forever be grateful to everyone who supported and encouraged me throughout this long and sometimes painful journey.

I would love to firstly thank God, for His grace. I also thank my family, Fortune, Fari and Mazvita; for their patience when I had to spend so much time away from them to do this project. I thank my parents, for their unwavering support and instilling in me from a very young age, the importance of working hard and a good education. My brothers and sisters, thank you for supporting me every day.

I would also like to thank my friends and colleagues who supported in so many ways. Josy and Rudo, for your unwavering support, I will forever be grateful. Hanifa, a perfect study partner. Susan, Doreen, Tsungi, Tendai, Richard and Ndisha; thanks for being there for me throughout this journey.

Last but not least, my project supervisor, Mr. Maarsdorp, I will always be grateful for your guidance, patience, and support throughout this journey, without which I would have never gotten here!

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION	1
1.1 Introduction	1
1.2 Key definitions	2
1.3 Research Objective	3
1.4 Research problem/statement.....	3
1.5 Research puzzle	4
1.6 Significance of the study	4
1.7 Theoretical Framework.....	5
1.8 Research Methodology	6
1.9 Assumptions	8
1.10 Delimitation of research	8
1.11 Ethical clearance required?.....	8
1.12 Outline	8
CHAPTER 2: KNOWLEDGE MANAGEMENT SYSTEMS	10
2.1 Introduction	10
2.2 Knowledge Management System Implementation.....	11
2.3 Failure factors of KMS Implementation.....	15
2.4 Assessment approaches for KMS	17
2.5 Knowledge Management Systems in multinational organizations.....	19
2.6 Organizational strategy and KMS	22
2.7 Factors affecting KMS establishment and maintenance in organizations.....	24
2.8 The key issues of knowledge management systems.....	26
2.9 Conclusion.....	28
CHAPTER 3: THEORETICAL FRAMEWORK	30
3.1 Introduction	30
3.2 Two Perspectives on Knowledge Management Systems	31
3.2.1 The Practice View	31
3.2.3 The Possession view.....	32
3.3 Knowledge Management Solutions Framework	33

3.3.1	Knowledge Management Infrastructure.....	34
3.3.2	Organization culture.....	34
3.3.3	Knowledge Management Technologies.....	38
3.3.4	Knowledge Management Mechanisms.....	38
3.3.5	Knowledge Management Systems.....	40
3.3.6	Knowledge Management Processes.....	41
3.4	Communities of Practice as a model.....	44
3.4.1	Organizational knowledge and Communities of Practice.....	45
3.4.2	COP Success Factors.....	48
3.5	Conclusion.....	53
CHAPTER 4: CASE STUDY (AIDORG).....		54
4.1	Introduction.....	54
4.2	Knowledge Management Infrastructure at AIDORG.....	55
4.2.1	Organizational Culture.....	55
4.2.2	Organization Structure.....	57
4.2.3	Information Technology Infrastructure.....	59
4.2.4	Common knowledge.....	61
4.2.5	Physical environment.....	62
4.3	Knowledge Management Mechanisms.....	63
4.4	Knowledge Management Technologies.....	70
4.5	Knowledge Management Systems and Processes.....	72
4.5.1	Knowledge Discovery and Knowledge Discovery Systems.....	72
4.5.2	Knowledge Capture and Knowledge Capture Systems.....	74
4.5.3	Knowledge Sharing and Knowledge Sharing Systems.....	75
4.5.4	Knowledge Application and Knowledge Application Systems.....	76
4.6	Conclusion.....	77
Chapter 5: FINDINGS AND DISCUSSION.....		78
5.1	Introduction.....	78
5.2	Qualitative Analysis.....	79

5.2.1	Participant Observation Overview	79
5.2.2	Knowledge Management Infrastructure	79
5.2.3	Knowledge Management Technologies	83
5.2.4	Knowledge Management Mechanisms	84
5.2.5	Knowledge Management Systems and Processes	86
5.2.5.1	Knowledge Discovery through Combination and Socialization	86
5.2.5.2	Knowledge Capture through Internalization and Externalization	88
5.2.5.3	Knowledge sharing through socialization and exchange	89
5.2.5.4	Knowledge Application through routines and direction	90
5.3	Quantitative Data Analysis	91
5.3.1	An Overview of Questionnaires	91
5.3.2	Use of the KMS for Knowledge Capture, Sharing and Discovery	91
5.3.3	Knowledge Discovery Technologies and Systems	96
5.3.4	Knowledge Sharing and Capture Technologies	99
5.3.5	Knowledge Management Infrastructure	101
5.3.6	Knowledge Management Mechanisms	103
5.4	Conclusion	106
CHAPTER 6: CONCLUSION		107
6.1	Introduction	107
6.2	A Practice Based KM Approach	107
6.3	How CoPs fit at AIDORG	109
6.4	Management Support for CoP Success at AIDORG	113
6.5	COP Challenges for center-periphery organizations	114
6.6	Conclusion	114
LIST OF REFERENCES		116
APPENDIX A - QUESTIONNAIRE		121

GLOSSARY OF TERMS

KMS – Knowledge Management Systems

K - Knowledge

KM – Knowledge Management

CoP – Communities of Practice

AIDORG – a large aid organization

AIDORG /W – the head office of the organization

IT – Information Technology

ICT - Information and Communication Technology

KDID – Knowledge Driven International Development

DEC – Development Experience Clearinghouse

CLA – Collaboration, Learning and Adapting

ADS – Automated Directives System

FSN – Foreign Service National

TDY – Temporary Duty

LIST OF FIGURES

Figure 1: The relationship between KMS failure factors	16
Figure 2: A KMS as a part of knowledge management strategy (Denning)	24
Figure 3: Knowledge Management Solutions, Source: Becerra-Fernandez & Sabherwal, (2010:68)	33
Figure 4: Knowledge Management Process. Source: Becerra-Fernandez, 2010	41
Figure 5: COP success factors. Source: Probst, G.and Borzillo, S (2008).....	53
Figure 6: AIDORG organizational structure	57
Figure 7: Use of KMS to capture knowledge.....	92
Figure 8: Use of the KMS to discover knowledge	93
Figure 9: Use of the KMS to share knowledge	94
Figure 10: AIDORG/Work experience	95
Figure 11: Use of KMS to share, discover and capture knowledge	96
Figure 12: Knowledge Management Technologies Trends	97
Figure 13: Knowledge Storage Frequencies	100
Figure 14: Knowledge Management Infrastructure Changes	102
Figure 15: Knowledge Management Mechanisms rankings	106

LIST OF TABLES

Table 1: Responses from staff who have not worked at AID/W	95
Table 2: Knowledge Management Technologies – Distributed Statistics	97
Table 3: Knowledge Management Infrastructure changes.....	102
Table 4: Knowledge Management Mechanisms frequencies.....	104
Table 5: Descriptive Statistics for the knowledge management mechanisms	104

CHAPTER 1: INTRODUCTION

1.1 Introduction

Organizations with a center-periphery landscape rely on their decision makers to make the most critical decisions based on inputs from multiple locations. The geographical distribution of organizations has increased KMS dominance; face-to-face communication and personal networks for information sharing are challenging in this type of setup, therefore organizations are putting more effort in the codification of knowledge so that it can be used widely in their distributed locations. This increases the complexity of the knowledge required to make decisions and therefore requires a high level of knowledge management, making communication and team-collaboration skills a necessity. With the rapid technological advances, the pace of change within each market domain is increasing, continuously reducing the time required to take action and make decisions which will have considerable impact.

As organizations are increasingly valued for their intellectual capital, the collective knowledge residing in the minds of organizations' employees has been the most vital resource of today's enterprise. However, high levels of employee attrition mean that organizations are losing some of their knowledge on a continuous basis, because only a few of them take steps to prevent the escape of knowledge that follows employee departure. Knowledge Management Systems focus on capturing and managing this important knowledge for organizations, making it available when and where it is needed.

According to Newell et al (2009), one set of knowledge which is necessary for the design and implementation of a KMS is the technical programming and design know-how; knowing how to design a good KMS. Because the systems are rarely designed by people who use them, even though the systems may be well-designed, organizations are faced with the issue of fit between the system and the practices of the organization, as well as acceptance of the system within the organization's culture (Gamble & Blackwell, 2001).

However, even good design and implementation of KMS in organizations does not mean that experts will automatically share knowledge for the benefit of the organization. Whilst information technology facilitates the sharing and accelerates knowledge growth through increased speeds and efficiencies, effective KMS initiatives are not limited to technological solutions, there is still need for other supporting initiatives for KMS to be successful. These

include top management support, willingness for the organization and the users to accept the changes which the KMS brings, users' understanding of the function and limitation of the system, a focus on systems which encourage collaboration and content management so that the system remains useful (Akhavan et al, 2005).

1.2 Key definitions

Knowledge is the ability to discriminate within and across contexts (Newell, 2009). The two views which stand out in knowledge work studies in organizational settings are the epistemology of possession (knowledge seen as a possession of the human mind and treated as a resource) and the epistemology of practice (knowledge constructed and negotiated through social interaction) (Cook & Brown, 2009). According to McDermott (1999), knowledge is not valuable in and of itself, only when it is applied to specific tasks.

Center-periphery organization refers to an organization where authority, resources and development are more concentrated at the center (head office) than the periphery (field offices). The periphery is where the center's power is displayed; organizational wide decisions are made at the center and are expected to be adopted by all periphery sites. A center is defined by a periphery that encompasses it, that is, the periphery is necessary for the center to function, and vice versa. The level of authority at a periphery depends on whether decisions to be taken need any representation from the peripheries or not, periphery sites usually have limited authority to make decisions which affect their sites only.

Organizational knowledge: a learned set of norms, shared understandings and practices that integrates actors and artefacts to produce valued outcomes within a specific social and organizational context (Newell, 2009). This can be reflected in what people say, do, or the routines and systems which they use.

Knowledge Management Systems (KMS) refer to any kind of IT system that stores and retrieves knowledge, improves collaboration, locates knowledge sources, mines repositories for hidden knowledge, captures and uses knowledge, or in some way enhances the Knowledge Management process.

Knowledge Management refers to explicit strategies, tools and practices applied by management that seek to make knowledge a resource for the organization. It is less about converting , capturing and transferring different forms of knowledge and more about building

an enabling context that connects different social groups and interests, identities and perspectives to accomplish specific tasks and purposes (Boland & Tenkasi, 1995).

Even though knowledge management has been heralded as essential to efforts to improve competitiveness and innovation, many attempts to manage knowledge in organizations have failed to deliver the promised improvements (Scarbrough and Swan, 2001). Whether or not knowledge leads to improvement depends on how tasks, actors and contexts come together. There is therefore a need to align all three dimensions of knowledge work; which are enabling contexts, purposes and processes. According to Nonaka, the way to create knowledge in organizations is to identify important tacit knowledge, make it explicit and convert it back again into tacit knowledge of others elsewhere in the organization so that it can be applied.

In the 21st century, managing knowledge work is less about direct control and capture of knowledge in systems; it's more about providing an enabling context that supports the processes and practices of applying knowledge for specific tasks and purposes (Newell, 2009). According to a survey conducted by Dyer and McDonough (2001), retaining employee expertise, enhancing customer satisfaction and increasing profits, are the top three reasons why firms in the US adopt knowledge management.

1.3 Research Objective

The following objectives are pursued:

- To explore the nature of knowledge management systems (KMS) in a center-periphery organization.
- To assess the operational effectiveness of the center-periphery KMS within a center-periphery organization.
- To provide recommendations for strengthening the existing KMS to better serve its clientele.

1.4 Research problem/statement

What is the operational architecture of KMS at a center-periphery organization?

What are the internal and external factors affecting the KMS at a center-periphery organization, including strengths, weaknesses, opportunities and threats to the KMS?

What are the possible areas for improving the center-periphery organization's KMS to be more proficient?

1.5 Research puzzle

This research is a puzzle because to the researcher's knowledge, there is no specific research on knowledge management systems in a center-periphery landscape. Most knowledge management system research has been about managing knowledge in multi-national companies, without specifying whether these companies have a center-periphery structure or not. The research has also targeted mainly private organizations, and this research seeks to include donor organizations as well. In some multi-national organizations, country offices manage their own operations and do not necessarily use the same knowledge management systems as their head office or other country offices. This research will focus on an organization which largely uses the same knowledge management systems for both the center and the periphery.

The lack of specific research also means organizations with a center-periphery setup could be losing knowledge, either because the current knowledge management systems are not effective, or because the current knowledge flows do not support the knowledge management systems in use. Organizations with this knowledge management landscape therefore need knowledge management systems which support the capture, retention and sharing of knowledge, connecting people to information, experience and expertise regardless of locations.

Whilst most organizations have implemented knowledge management systems, some of the systems are never used or understood. This research will explore factors which stimulate or hinder use of knowledge management systems in center-periphery organizations. The research will provide recommendations specifically for organizations with a center-periphery structure; highlighting the challenges faced in managing the knowledge management systems, factors which can help to improve the proficiency of the KMS, as well as those which work against it.

1.6 Significance of the study

This thesis will provide insight on how organizations in a center-periphery structure can leverage their knowledge management systems to improve their proficiency. To the researcher's knowledge, it is not known that knowledge management systems research which

is specific to center-periphery organizations has been conducted. In this era where organizations are continuously competing for customers or funding, knowledge management systems can be used to remain relevant, as knowledge which is retained and later discovered in these systems can be used as a strategic tool to gain an edge over competitors. However, the implementation of these systems does not guarantee success for organizations; the systems have to be suitable for the organization and be used consistently for them to provide a competitive edge.

The thesis will contribute knowledge management systems suggestions and solutions for organizations with center-periphery architecture. The solutions will take into consideration views from users of the knowledge management systems in this setup both at the center and the periphery, as well as internal and external constraints to knowledge management systems success in the center-periphery environment. The constraints, which include operating environment, IT governance, operating costs, infrastructure availability and advancement, and human factors such as skills, are usually different for the center and the periphery.

This study will investigate how the differences in constraints between the center and the periphery, as well as the geographical barriers, affect a center-periphery organization's knowledge management systems. Based on the findings and recommendations of this research, center-periphery organizations will be able to make strategic adjustments so that they can improve their proficiency and fully benefit from their knowledge management systems.

1.7 Theoretical Framework

Newell (2009) provides a distinction between two different types of knowledge management, the possession and practice views. The possession view looks at knowledge as being “embrained and embodied in the skills and heads of individuals or organizations”, whilst the practice views sees knowledge as being “embedded, embodied and invested in practice” (Newell et al, 2009:18).

Meanwhile, the Knowledge Management Solutions framework covers the four different types of knowledge management systems (knowledge discovery systems, knowledge capture systems, knowledge sharing systems and knowledge application systems) and the knowledge processes supporting the KMS, that is, knowledge discovery, knowledge capture, knowledge sharing and knowledge application (Becerra-Fernandez and Sabherwal, 2010). Because the

knowledge management processes serve complimentary objectives, the framework emphasizes the need for organizations to use a combination of the knowledge management processes. This framework will allow the investigation of the knowledge management processes, systems and sub processes which are best suited for organizations with a center periphery knowledge management landscape. It will also highlight the knowledge management mechanisms and technologies that facilitate the knowledge management processes so that center-periphery organizations can focus on developing and acquiring only those which are relevant to their needs.

1.8 Research Methodology

The investigation of knowledge management systems in a center-periphery organization is a complex situation and a poorly understood phenomena, due to the little research that has been done in that area. The study is exploratory in nature, and also involves variables which cannot be practically resolved using experiments.

Qualitative and quantitative research approaches will be used in this research, to gain new insights, develop new concepts or theoretical perspectives, as well as discover challenges that exist within the knowledge management systems in center periphery organizations. Qualitative research is often seen in studies of complex situations, including where there is need for in-depth perceptions and better understanding about a particular issue (Leedy & Ormond, 2001). It is also best suited to answering questions of description and explanation from the perspective of the members of the organization under study (Lee, 1998).

The proposed research will require an in-depth study of the knowledge management processes and systems in a center periphery organization, making a case study an appropriate research method. A case study is defined as “a type of qualitative research in which in-depth data are gathered relative to a single individual, program or event, for the purpose of learning more about an unknown or poorly understood situation”.

According to Lee (1998), the in-depth data and local contextualization associated with case study research generally allows for stronger causal inferences compared to those which are allowed by correlational field studies, making case studies suitable for the explorations of organizational questions which cannot be resolved using the traditional experimental design. Case study research also tends to focus on the how and why organizational phenomena occur, and whilst the issue of whether a center periphery organizational structure affects knowledge

management systems is poorly understood, this in-depth study will reveal the nature of the knowledge management processes, systems, as well as the relationships between the systems and the organizational structure; allowing the researcher to provide recommendations for policy and practice effectiveness in center periphery organizations. This potential of research to improve organizational processes also enhances the likelihood of cooperation among the participants of the study (Lee, 1998).

I will be a participant observer at the organization under study during this research, which means I will spend an extended amount of time within the organization, my role and observational activities will not be hidden and I will “establish and nurture normal work and personal relationships” with the users and decision makers in the organization (Lee, 1998:99). According to Lee, the primary advantage of this technique is the firsthand knowledge which is gained in real time about organizational phenomena, which is usually rich in contextualized detail.

One of the defining characteristics of qualitative research is the “focus on the participants’ point of view” (Lee, 1998:42). It will be important for the researcher to understand the participants’ (users of the knowledge management systems) experienced context, and their unique perceptions, assumptions, prejudgments and presuppositions will be central during this research, allowing the researcher a better understanding of users’ behaviors in relation to knowledge management systems. A questionnaire will be distributed within the organization to gather data for this research.

Documents, policies and other occurrences will also be examined during the study for any meanings which they might have in relation to knowledge management systems within the organization. The analysis of documents will involve the study of public documents which relate to the knowledge management systems of AIDORG, and analyzing what effect any policies or regulations have on the effectiveness and adoption of knowledge management systems within the organization. Yin (1994) advises case study researchers to include quantitative analysis when it’s appropriate, and quantitative analysis might be used in this research for data analysis if necessary.

1.9 Assumptions

The organization under study has a center-periphery organizational structure and therefore provides a good representative case of center-periphery organizations; it has most of the departments which are found in center-periphery organizations.

Knowledge management systems are being used at AIDORG and it is assumed that respondents at the field office on the periphery have a good understanding of the knowledge management systems in use at their organization.

1.10 Delimitation of research

The research will mainly be focusing on the AIDORG/Zimbabwe periphery office. This is based on convenience, since this is where the researcher is based, and this office is also considered to be a good representation of an organization with a center-periphery setup. Knowledge management systems views from the head office (center) will be gathered remotely and by reviewing literature of policies and decisions made at head office which are applicable to knowledge management systems. Most center-periphery organizations are usually large, and focusing on only one organization will ensure that a thorough research of the organization can be done and completed.

1.11 Ethical clearance required?

The research involves people and clearance will be sought to ask questions from employees. All users who will participate in the research will be told before they participate how information gathered from them will be used. Ethical clearance according to Stellenbosch University rules was secured.

1.12 Outline

1. Introduction – introduces the research topic and leads to discussion of research problem and why there is a necessity for this investigation. What does it contribute to the body of knowledge, what are assumptions of this research as well as the delimitations?

2. KMS State of the Art – What is the current state of knowledge management systems? A review of available literature about the research topic, including discussions of KMS investigations done by others. Search of literature for ideas which may shed more light on the research problem, as well as strategies that may assist to address the research problem.

3. Theoretical Framework – What theories exist which can be used to describe the knowledge management systems. How is the selected framework suitable to describe the organization’s knowledge management system?
4. Description Of AIDORG KMS – A description of how knowledge management systems are supposed to be working at AIDORG, using the theoretical framework selected above. What are the knowledge management system implications of a center-periphery organizational structure?
5. Findings and Discussion – a discussion of the research findings based on the theoretical framework and the research objectives. How do the KMS at AIDORG work, based on the users’ responses to a questionnaire and participant observer’s perspective?
6. Conclusion – what are the major conclusions of the study and based on the research findings, what are the recommendations to AIDORG and other organizations with a center periphery organizational structure? Are there any recommendations for further research?

CHAPTER 2: KNOWLEDGE MANAGEMENT SYSTEMS

2.1 Introduction

Within the field of knowledge management, the topic of knowledge management systems is the most discussed as well as debated, even though it's not necessarily the most important. This has resulted in there being no consensus about what constitutes a KMS. Robertson (2007) argues that organizations should focus on determining functionality of the required organizational IT systems instead of thinking in terms of knowledge management systems to avoid expectations of silver bullet solutions. Botha et al (2008) argues that it's important for organizations to understand what knowledge management systems cannot do on their own, and focus on other initiatives which are required to be put in place to complement the knowledge management systems to ensure success.

Meso and Smith (2000) describe a KMS as consisting of technology, function and knowledge, and Lotus (2001) argues that knowledge management systems can be used to improve an organization's responsiveness, innovation, competency as well as efficiency. A KMS' role is specified by the actions which should be involved in the knowledge management process and the KMS provides the IT support for these processes. The processes include the acquisition and collection of the knowledge to be managed, coming up with a structure which will allow effective knowledge management, all the stages of knowledge maintenance and making knowledge available to the knowledge workers who need it (Benjamin & Fensel, 1998).

According to Gamble and Blackwell (2001), whilst there are a lot of knowledge assets and flows within organizations, it's critical that the organizations be able to understand and apply knowledge management principles if they are to take advantage of the knowledge they have. Organizations should be able to measure their knowledge management aptitude, including staff awareness, management commitment, organizational culture and IT infrastructure. Through KMS, people have more access to knowledge than before, and pace of change is also faster, hence the need for organizations to be more responsive than before if they are to remain relevant. Some of the factors which drive the implementation of knowledge management systems in organizations include an increasingly mobile and global workforce, increasingly complex business environment which lead to increased innovation, increase in management commitment to KM, and need to reduce knowledge loss during employee turnover. And whilst one of KMS' goals is to reduce the re-invention of the wheel in

organizations, it's estimated that up to US\$31 billion was still spent in re-invention costs by Fortune 500 companies (Gamble & Blackwell, 2001).

According to Prusak (1999), approximately 80% of the global 1000 businesses are conducting a knowledge project, which means many of the world's most successful corporations, businesses and organizations are investing considerable resources in this enterprise. Most multi-national companies have set up knowledge teams and knowledge leaders who specifically focus on knowledge initiatives. McCambell et al (1999) argues that the business environment is characterized by radical change, and there is need for use of intellectual capability to take a central place.

In a KMS, people, technologies and knowledge interact to make a knowledge management system. KMS give organizational users the knowledge which they need to make decisions and perform tasks (Davenport et al, 1998). Organizations need to be able to anticipate these changes and develop a faster knowledge creation cycle, as well as use the ideas of employees, customers and suppliers; building on past experiences to create new mechanisms of knowledge creation and exchange which improve organizational performance.

2.2 Knowledge Management System Implementation

According to Newell et al (2009), even though it's rare that both would be known by one person, technical programming and design know-how and organizational know-how (based on knowledge flow understanding) are both critical for the design and implementation of a KMS. Gamble and Blackwell (2001) argue that this results in organizations being continuously faced with the challenge of systems and practices which do not fit each other. According to Frost (2010), "the strategic implication of implementing a KMS which significantly aims to change the way things are done in the organization requires proper consideration and careful planning" (<http://www.knowledge-management-tools.net/>).

Brown and Duguid (1998) also highlight the importance of having technologies and other structures in place to facilitate the circulation of knowledge in the organization. The budget which is allocated for KMS implementation differs by organization, but the main factors affecting budget size include organization size, the infrastructure in place at the time the KMS project is started, and the scope of the KMS project (organizational wide or only involving a few teams). If an organization already has other KMS in place, then it's most likely that they will have most of the infrastructure required to deploy a new KMS, thereby significantly

reducing the budget. Small organizations are also likely to invest in KMS which are not resource intensive compared to bigger organizations; it's most likely that smaller organizations will have less data to deal with whilst bigger organization will have more users, who are globally sparse and require fast tools to retrieve the vast knowledge in the KMS for the system to be effective.

Grasic and Podgorelec (2011) highlight the importance of a feasibility study when considering KMS deployment, answering the question of whether KMS is needed in an organization, as well as the type of KMS which is most suitable. They describe two classes of KMS, common KMS and intelligent KMS. Common KMS examples include content management systems, document management systems and Wiki. Intelligent KMS provide solutions to complex questions as well as deduce new knowledge but the implementation process is complex, expert systems are an example of intelligent KMS.

While knowledge management is fast becoming one of the key success factors in the global economic environment, KMS implementation does not guarantee organizational success. There is still need for organizations to do strategic adoption of knowledge management systems. According to Hansen et al (1999), codification and personalization are the two kinds of knowledge management strategies. Whilst codification involves the re-use of codified knowledge in knowledge bases, personalization is driven by people to people networking, including Communities of Practice (CoP). In CoP, directories of expertise, networking events and online collaboration spaces are important processes which encourage knowledge management. Both strategies have obstacles which can affect adoption; personalization can be affected by a hoarding mentality in the organization as well as cultural differences for the global organization, whilst codification can be affected by the issue of management of the knowledge content, including security, version control and interactivity (Hansen et al, 1999).

The processes of adoption, acceptance and assimilation are required for successful implementation of KMS.

For the promotion of KMS adoption in the organization, it's important for an analysis of the internal processes of an organization to be done. The evaluation of knowledge flows, lines of communication and communities of practices can result in findings which are then used to determine the knowledge management systems required in the organization. It's also important for the new knowledge management systems not to hinder existing work practices, and a cost benefit analysis needs to be done to make a case for the new system. KMS success

is based on organizational effectiveness improvements, which is based on KMS use and impact. KMS use may have positive or negative impacts in an organization, and feedback from these impacts determines continued use or discontinuation of KMS. Some of the key factors for KMS adoption include commercial advantage, information quality, cultural values and information quality (Hetch et al, 2011).

According to Liebowitz (2009), user involvement during the design, evaluation and implementation processes of the KMS can improve acceptance. It is also important for a KMS to be user friendly and intuitive; users should not struggle to find as well as contribute knowledge, and generally use a new KMS, otherwise they will easily revert to old ways which do not promote the organization's knowledge management efforts. Once the organization's knowledge is captured, the power of the knowledge occurs when users utilize the knowledge by putting it into action. This then leads to better organizational practices, strategies and policies; leading to improved organizational productivity and competitiveness (Davenport & Prusak, 1998). It is also important for knowledge management systems to support multiple perspectives of the knowledge stored; different users in an organization will have different knowledge needs and the system should be able to address each user's needs. It's therefore important for a KMS to be able to provide the requested knowledge to a system user as quickly and accurately as possible. Users will not have time to filter through multiple results to find the information they are looking for.

There is need to provide adequate technical and managerial support; the technological needs of a KMS should be analyzed before deployment, including availability of technical support staff as well as equipment. Management support also influences KMS acceptance; ideally management should be the leading users of knowledge management systems to be an example to other users, and show commitment of the organization to knowledge management. Hecht et al (2011) highlights anxiety, ease of use, job fit, and results demonstrability as some of the factors affecting KMS acceptance.

Gamble and Blackwell (2011) argue that it's important for KMS content to be kept relevant. Whilst several organizations have a knowledge management department which would be responsible for this task, organizations without this department need to allocate that role to someone who can do it consistently. Users are unlikely to return to a KMS to look for knowledge if they have found out of date knowledge on it before, or if they struggled to find what they were looking for due to poor organization of the system.

Attractiveness factors can also improve assimilation; the advantages of using the KMS should draw everyone in the organization to use it, and management should also be able to easily convince users to use the system based on these advantages. During a time when most organizations are operating in areas which are outside their countries, it is important for a KMS to focus on collaboration. A wide variety of knowledge management technologies are available, and these can be easily incorporated into KMS to enable collaboration. These technologies generally provide motivation for users who are globally dispersed to share and search for knowledge on a KMS (Gamble & Blackwell, 2001).

It's important for management to be the champions during KMS implementation; they generally have more platforms to address everyone in the organization, and they can use these to encourage KMS use. They are also capable of changing the way knowledge flows in an organization, and generally users are likely to use a KMS if management is using it create/share important knowledge which is not available anywhere else in the organization. Planning for expenses is also important for KMS deployment; including training and other technical and software costs. Organizations generally will continue using a KMS if it's cost efficient, otherwise it becomes difficult to justify continued use of a KMS, especially if older ways of managing knowledge were less expensive and still efficient.

Grasic and Podgorelec (2011) highlight the importance of KMS acceptance by the users, and identified the following as factors which can empower KMS utilization. Everyone in the organization should agree to the knowledge in the KMS; if some of the users do not agree with the knowledge in the system, it's most likely that they will not use the KMS nor encourage others to use it. The knowledge in the KMS should also be structured well and valid at all times; the probability is high that if a user is searching for knowledge in the KMS and they find knowledge which is no longer valid, they will no longer trust the reliability of the system and could start looking for other means of finding knowledge all the time. The KMS should also be systematically maintained, to such an extent that there is no room for ambiguity in the knowledge provided by the KMS. It's also important for the knowledge in the KMS to be reusable; users generally do not want to re-invent the wheel, they want to be able to use the same knowledge in other organizational processes and information systems.

Alavi and Leidner (1999) also highlight the following as capabilities which are desired in a KMS. The KMS should be capable of providing access to customer, client and competitor information, that is, external information which is not normally available without a KMS. The

KMS also needs to have technological capabilities, including wider bandwidth, interoperability of existing systems and fast retrieval of knowledge. Practical guidelines on how to build and implement the KMS should also exist, as well as how the KMS will facilitate organizational change to promote knowledge sharing, services information and other internal information.

2.3 Failure factors of KMS Implementation

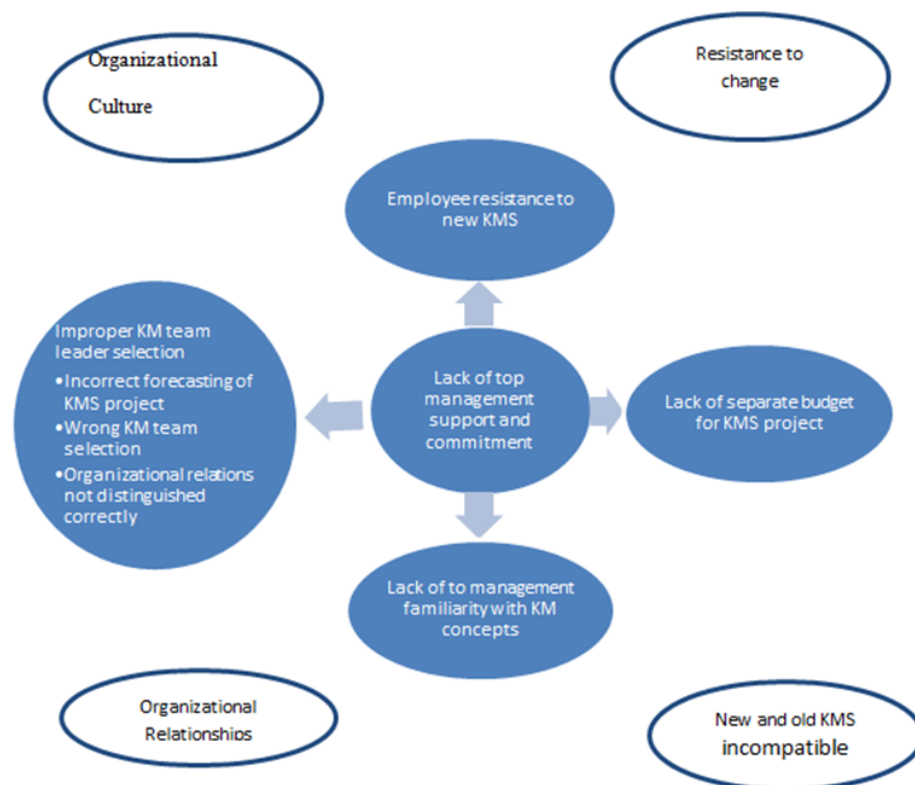
What causes knowledge management efforts to fail in an organization? In today's knowledge based society, it is becoming increasingly important to manage an organization's intellectual capital. KMS create an environment where knowledge emerges and flows to the right people at the right time, increasing organizational efficiency and effectiveness. They promote an integrated approach, where both internal and external existing knowledge is used to create new knowledge and generate innovation as well as improvement (Smith, 2001). According to Malhotra (2004), there are two main reasons why KMS fail. The KMS may be defined in terms of inputs which may be inadequate for effective organizational performance; and also no one questions the strategic deployment of KMS inputs as long as performance objectives are being achieved.

Some of the challenges faced by organizations when implementing KMS include lack of alignment between an organization's knowledge management efforts and strategic objectives, failure to embed knowledge management into employees' work activities, an overemphasis on formal learning, and limiting the organization's knowledge management efforts to internal boundaries (Fontain and Lesser, 2002). Organizations with a center-periphery structure anticipate knowledge sharing and collaborative working across national boundaries after implementation of KMS. Some of the common areas which organizations hope to improve with KMS deployment include easy access to existing information content, more access to official organizational resources, uniform format of information held in the KMS and increased interest in knowledge management by senior management.

According to Fontain and Lesser (2002), the most important failure factors in organizational KMS implementation include senior management not being familiar with knowledge management dimensions, inexperienced knowledge management team leader and team members, lack of a separate budget, the culture of the organization, top management not supporting the KMS project, users' resistance to change, and conformities between the old and new KMS. Figure 2.1 below shows the relationships between the failure factors, with the

lack of management support being pivotal to the other failure factors (Akhavan et al, 2005). It is critical for organizations to specify a timescale when deploying a KMS, as well as have a suitable and separate budget for the project as it is usually resource intensive. Cost restrictions might result in the deployment team not being able to meet regularly to discuss the project if the team is spread over different locations. They might also not be able to spend enough time in understanding the incompatibility between the old and new systems because they want to meet the deadlines and not exceed the allocated budget. It also means the team might not be able to travel to the different locations to meet face-to-face with the users of the system and explain the KMS, which may also result in users not cooperating with the knowledge management team and being resistant to change of their work practices when the KMS is deployed.

Figure 1: The relationship between KMS failure factors



Source: Adapted from Akhavan, Kafari and Fathian, *Journal of Knowledge Management Practice* (2005)

According to Fennessy (2002), the roles, values and norms of the knowledge workers have a huge impact on the development and implementation of a KMS. There is need for the knowledge management team to have programs in place to conquer the users' resistance against knowledge management changes. Stephen Denning highlights this challenge in *The Springboard*, when he describes how employees were resisting the introduction of knowledge

management at the World Bank, “.....*the report is eloquent and comprehensive. It tells everything one could want to know.....yet there is little evidence that anyone wants to know. Hundreds of copies have been printed, but they lie in a pile in the bookcase in my office, neglected and unread*” (Denning, 2000:30). It’s therefore important that when the KMS is deployed, it contains valuable knowledge for the users; otherwise users will ignore the KMS and continue to use their existing mechanisms to find and store knowledge.

Senior management commitment and support are critical when an organization is deploying or changing a KMS, especially at milestones which need direct management support. Whilst the knowledge management team may send e-mails to users to introduce the system, KMS acceptance is better if senior management are involved in the KMS announcement, using the KMS in their day-to-day work and setting aside time for the users to get used to the system, as well as rewarding those who access the KMS to access and share knowledge. Once users get the impression that senior management is not prioritizing and directly supporting the KMS project, cooperation with the knowledge management team is further reduced. It is therefore important for senior management to have an understanding of knowledge management concepts to be able to provide this support.

Whilst any project manager could lead a knowledge management project, research has shown that the risk of failure is reduced if the team leader of a KMS project has expertise about knowledge management, in addition to project management skills as they will be better able to manage the project effectively and solve bottlenecks. The knowledge management team is as important as the leader, it’s important for them to have good knowledge about knowledge management, as well as to have enough human resources for the project, who are familiar with the organization as well as its internal relations. It’s also helpful to have at least one person within the knowledge management team who has influence in the organization so that they assist with decisions which have an organization wide effect.

2.4 Assessment approaches for KMS

KMS assessment is vital for managers to determine whether a KMS is working or not, but few organizations have developed a separate KMS performance measurement system as the measurement process has generally not been part of the organizational culture. Organizations are increasingly required to justify allocation of resources for knowledge management systems, and support for knowledge management is unlikely to continue without measurable success. It’s also important to measure how often users are accessing, contributing to, or using

the knowledge resources which are available to them, as well as ask users about the attitudes and behaviors behind their actions.

According to Turban and Aronson (2001), measuring KMS success provides a basis for corporate evaluation, assisting organizational management to focus on important areas and justifies KM investments. The KMS assessment also helps organizations to understand how to build and implement KMS. Whilst the methods of KMS measurement will differ by organization, there are already barriers to the effective measurement of a KMS. Many organizations do not have a standard definition of a KMS, and this means there is no agreement on what is and what is not a KMS. The knowledge management efforts in an organization also have other impacts which are difficult to account for; it therefore becomes a challenge to pinpoint what resulted from the KM efforts and what did not.

Acceptance of standard assessment approaches has lagged, but it's a vital process for organizations to know if the implemented KMS is effective and it's a key area to the competitive success of organizations. KMS is only one of several inputs to progress within a complex system like an organization. The measurement of knowledge management system effectiveness has generally not been a part of organizations' culture because knowledge work is intangible, its success is not predictable and its success can only be measured after a long time. However there is need for the culture to evolve as organizations are increasingly required to demonstrate a return in KMS investment when resources are allocated to develop and implement KMS. Management also needs to make informed decisions about which systems work for their organizations before making further investments.

There is need to measure both the outcomes and activities of a KMS; activities include users' access, contribution, and use of the KMS, as well as the reasons behind their behaviors. Surveys are a useful way to measure users' behaviors. According to Turban and Aronson, proving a basis for corporate valuation, stimulating management to focus on what is important, understanding how KMS should be built and implemented, and justifying investments in KM activities are the three main reasons for measuring KMS effectiveness. However, organizations lacking standard KMS definitions, knowledge management secondary effects which management cannot account for, and knowledge managers not using KMS measurement to increase the scope of their activities remain as some of the barriers to the effective measurement of KMS effectiveness. Key performance indicators can also be used to measure the organizational progress towards KMS objectives.

2.5 Knowledge Management Systems in multinational organizations

According to a study done by Nielsen and Michailova (2007), there are four types of KMS that are associated with organizations which have a headquarters in one country and operations in multiple countries. The KMS are generally associated with improved decision making, greater innovation, better flexibility and adapting better to changing conditions, as the organization increases knowledge utilization and knowledge creation. The need for the organizations to understand knowledge concepts, as well as the effectiveness of mechanisms being used for knowledge management also increases.

The resources committed for KMS projects by the head office, the organizational structure and role distribution between the head office and the country offices affect KMS implementation in these organizations. These factors further highlight the importance of senior management involvement in an organization's KMS efforts. These systems need significant commitment of resources and strategic decision-making which means there is need for knowledge management efforts to be linked to an organizational wide strategy so that KMSs can also evolve as conditions and strategies change. Without this connection, there is a high risk of KMS failure as the organization might continue to use or deploy a KMS which is no longer suitable for the organization, leading to KMS failure even after everything has been done right (Nielsen and Michailova, 2007).

Nielsen and Michailova (2007) also argue that different knowledge views have different implications on the role and implications of KMS in an organization. A knowledge as an object view means the KMS will focus on knowledge gathering, storage and transfer, and the head office will centrally manage the KMS as well as knowledge transfer to periphery offices. In knowledge as a process view, the KMS will focus on linking multiple knowledge sources and increasing knowledge flows, and the organization's KMS will have a goal of increased flows and sharing of knowledge which is spread across the organization. In knowledge as a capability, the KMS focuses on enhancing individual and organizational intellectual capital, through free flows of knowledge among communities of practice to create a learning organization.

Organizational progress in knowledge management is affected by both internal and external factors (including knowledge management related staff, training and reward systems, resource commitment for knowledge management activities, and the organizational structure). However fit between knowledge structure and organizational structure is one of the key areas

for effective knowledge management; it's therefore critical for an organization to have an understanding of its knowledge flows between the head office and field offices for them to be able to select the correct KMS.

Nielsen and Michailova (2007) also discuss for different types of KMS which are found in multinational organizations; distinguished by the knowledge flows as well as the internal/external factors affecting them.

Fragmented KMS: The organization's knowledge is simple, storage efforts are not structured, and knowledge flows are spontaneous. There are no reward systems or knowledge management staff or training in place; rather departmental managers initiate knowledge management activities at random to store and retrieve knowledge using simple systems. The knowledge management systems have no top management commitment and minimal resources are allocated for the KMS projects as the organization emphasizes the need for cost efficiency, hence understanding of potential of knowledge management systems in the organization is very limited and knowledge management is not clear in the organization's vision.

The organizational structure where this KMS is found is typically very centralized; organizational knowledge is at the head office and knowledge flows are unidirectional, with head office approving knowledge to be shared between periphery sites. The organization is normally operating in a stable environment and does not have any pressure to change the technologies supporting its KMS.

Content-based KMS: The organization where this KMS is found has both simple and complex knowledge which is mostly explicit, and systems are in place to codify and transfer knowledge between the center and the periphery and re-use it, thereby increasing the organization's efficiency. The knowledge typically flows from head office (where the captured knowledge is centrally stored) to the periphery sites, and infrastructure development in the organization is mainly taking place at the center where all the organizational knowledge is centrally stored. The organization's top management is moderately involved in KMS efforts and as a result, resource commitment is also limited. Knowledge management positions exist at head office level, with limited training being made available to those involved in KMS development and implementation only when knowledge management mechanisms are in place and knowledge management starts being included in the organizational strategy.

Reward systems for KMS users also start to emerge in the organization's efforts to encourage knowledge sharing.

This type of KMS is normally found in organizations with a centralized organizational structure, with head office providing knowledge to periphery offices only when they see it to be necessary or when requested. Organization policies are used to control knowledge flows as well as knowledge quality, and there might be need for new structures which support effective knowledge management if existing policies hinder the organization's knowledge management efforts. A typical organization is operating in environment with moderate changes as well as moderate pressure to enhance technologies supporting the KMS.

Process-based KMS: Typically found in organizations where knowledge is complex and explicit; there are systems in place to create and use this organizational knowledge simultaneously. There are working systems in place and direct flow of knowledge between the organization's knowledge workers at head office and periphery sites, as well as direct knowledge flows between the periphery sites; organizational policies are used to control the knowledge flows. The level of top management support and resources committed towards knowledge management is high; both the head office and the periphery sites have knowledge management staff who design and implement knowledge transfer systems in close consultation with senior management, and these teams are provided with knowledge management training.

The organization typically has a complex technical design in a rapidly changing environment, there are high levels of pressure for technological improvements and metrics are typically in place to make sure the KMS in use is adding value as well as reducing organizational costs. This type of KMS is found in an organization with a decentralized organizational structure, with the head office only coordinating knowledge flows whilst the periphery office can store their own knowledge. This setup allows periphery teams to identify and modify knowledge management best practices according to local contexts, allowing knowledge generation to take place throughout the organization and experiences to be shared organization wide. As organizations begin to realize the value of effective knowledge management through efficient use and handling of knowledge, reward systems are used and are continuously refined to encourage users to sustain the sharing and application of knowledge, through supporting KMS use and making a commitment to share knowledge with others.

Capability-based KMS: This type of KMS is typically found in a multi-national organization that has both tacit and explicit knowledge, with a combination of simple and complex knowledge. The organization has the processes and infrastructure in place for knowledge creation, sharing and utilization; established knowledge flows exist between both internal and external knowledge workers, resulting in the organization with a capability-based KMS developing a sustainable advantage through continuous learning. Knowledge workers are rewarded for learning through the KMS, using knowledge in the KMS to create new knowledge, share knowledge and being innovative. The level of resources committed to KMS activities as well as top management support in the organization is very high.

Even though organization structure is distributed, specific knowledge management training within the organization is highly available, and employees are involved in the knowledge management activities which are made available throughout the organization through an infrastructure which supports collaboration. This creates learning opportunities, and knowledge resources as well as the expertise which employees in different countries may need are readily accessible anytime, anywhere. Effective knowledge management policies allow the head office and the periphery offices to work together as well as with external partners, regardless of time and location, resulting in knowledge networks (communities of practice), and multilateral knowledge flows, which allow the organization to compete based on knowledge.

This type of KMS encourages intellectual capital through support of individual and organizational competencies, encouraging experimentation and promoting knowledge creation and innovation. As a result, periphery offices which create and transfer knowledge which is relevant in the countries they operate in, or in the whole organization, get more attention and receive more resources for knowledge management, thus promoting knowledge sharing even at lower levels of the organization.

2.6 Organizational strategy and KMS

According to Tsai and Ghoshal (1998), the ability to manage an organization's dispersed knowledge provides an advantage to the organization. However for many organizations, the knowledge strategy and the knowledge management systems are not linked, hence the KMS challenges which are faced by organizations.

Due to different internal and external factors affecting different organizations, some organizations will change their KMSs regularly whilst some will use one KMS for a long time. An organization can change from complex to simple, or simple to complex KMS; depending on the interdependencies between the organizational factors and the environmental factors. According to Miles and Snow (1978), there is a link between environmental uncertainty, strategy and type of KMS; and usually changes start when there is no longer fit between the organizational strategy and the KMS.

Nielsen and Michailova (2007) identified low performance due to inconsistency among organizational internal activities and the ineffectiveness of existing KM strategy due to an organization's external environment changes, as the two main drivers of KMS changes in organizations. Knowledge is created and shared when the users pull the knowledge, as opposed to a centralized push of knowledge to users. An effective organizational KM strategy therefore needs to capture users' attention and motivate users to learn from, as well as be active contributors to the KMS, including the active maintenance of the KMS.

Because organizational strategy is critical for KMS effectiveness and the KMS transitions will involve changes in the organizational knowledge structures, there is need for the organization's top management to champion the KMS transition process. This will ensure KMS alignment to organizational strategy, structure and processes before the transition actually takes place.

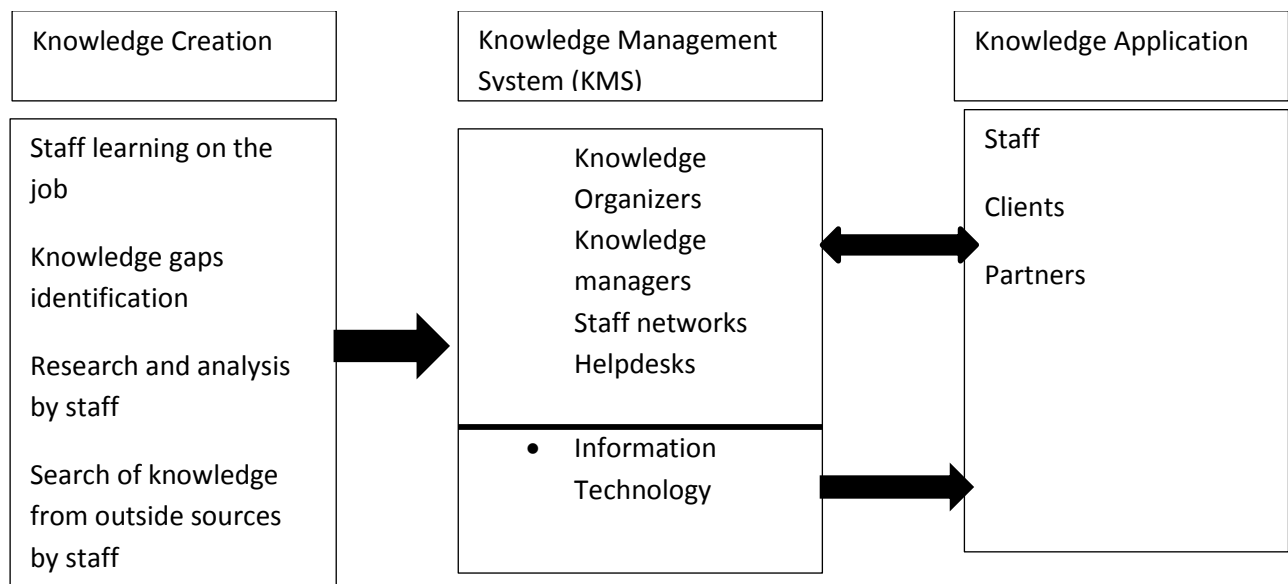
Stephen Denning highlights the importance of incorporating knowledge management systems in the organizational strategy, *“With a small but energized phalanx of supporters at a high level of the organization, in possession of a genuinely good idea, the organization is in significant disequilibrium. Sooner, rather than later, the pieces fall into place.....The president has announced the organization's commitment in the most public and irreversible way at the annual meeting of our organization. The idea is incorporated into a strategy document to be approved by the board of directors.....Knowledge sharing has thus been formally espoused by the organization.....The knowledge sharing strategy is depicted in a chart that captures all the elements that the management sees as a key to that strategy”* (Denning, 2000: 27-28).

Knowledge management systems, together with knowledge creation and application are listed as the key elements of the World Bank's knowledge management strategy. Figure 2.2 below

shows the relationship between these three key elements, where the created knowledge is stored in a KMS and then applied in the organization.

According to Alavi and Leidner (1999), the issues which make knowledge transfer difficult make it an important factor for every organization's strategy and this has resulted in organizations everywhere implementing KMSs which facilitate knowledge sharing and integration as they seek to achieve the correct amount of knowledge for the organization.

Figure 2: A KMS as a part of knowledge management strategy (Denning)



Source: Denning. S, 2011, The Springboard, Knowledge Management Chart, page 215

Grant (1996) highlights knowledge capture and integration as the main challenge for organizations, and organizations are being increasingly required to develop strategies which improve knowledge creation and integration, as well as implement KMS. By making knowledge readily available, KMS improves organizations' effectiveness and efficiency. Organizational flexibility, responsiveness to external conditions, innovation abilities and improved decision making are some of the positive effects of KMS.

2.7 Factors affecting KMS establishment and maintenance in organizations

It is important for the structure of the KMS to be designed in such a way that users do not need to put extra effort and time to make contributions to the system. In a highly structured KMS, employees may not be very motivated to share their knowledge because they do not

know in advance if someone may ever need to use the knowledge they are sharing. However, according to Atwood (2002), users are likely to be motivated to contribute once they understand how they will benefit from the KMS, and facilitators should assist users to minimize the time they spend making a knowledge contribution in the KMS. In loosely structured knowledge structures, participants are likely to be motivated to share their knowledge because responding and sharing knowledge more frequently also means greater visibility (Hahn and Subramani, 2000).

It's important for organizations to decide on the appropriate size and scope for a KMS. When the KMS is being used by a small group of people, there is a possibility of losing valuable information and participation may not be worthwhile due to insufficient resources in the KMS. Maintaining a steady stream of contributions to KMS content is also very important. However, if the group is too big, there is also an increased risk of system overload with irrelevant information, and incentive to participate in discussions might decrease due to the increased effort required to participate (Hahn and Subramani, 2000).

Knowledge facilitators complement the KMS limitations through quality verification as well as encouraging KMS adoption by users (Weber, 2007). While the KMS may increase access to experts within and outside the organization, there is a possibility of the experts spending a lot of their time responding to users' queries. Whilst this means quick responses and efficiency for the system users, the experts may not be motivated to contribute to the KMS in the future if they feel burdened with the users' queries. Organizations therefore need to come up with measures to protect their experts, ensuring that they remain motivated to share their expertise.

Subramani and Hahn (2000) recommended the use of technical approaches; organizations can encourage users to check the Frequently Asked Questions (FAQ) or other knowledge bases to confirm the knowledge they seek is not already available before sending questions to experts.

Offering a benefit for the time spent by users contributing knowledge to the KMS may provide the needed motivation to continue contributing. However, whilst the issue of incentives to encourage knowledge sharing is important, there is a risk of staff sharing knowledge which is not useful to the organization, just so that they can get the monetary rewards which the organization will be offering. It's important for a deployed KMS to provide enhanced knowledge to the importance aspects of the organization, that is, areas which are highly valued in the organization; otherwise the KMS value in the organization is not realized.

It is also important for users to see the value of contributing knowledge to the organizational KMS, otherwise they will not contribute. Organizations therefore need to be more creative when designing approaches to incentivize their staff (Disterer, 2001).

2.8 The key issues of knowledge management systems

There is need to invest in the alignment of cultural, technological, managerial and organizational issues before an organization can benefit from knowledge management systems (Alavi and Leidner, 1999). Effective KMS are closely related to an organization's ability to resolve cultural and organization issues. According to Disterer (2001), users may withhold knowledge as a way of being influential in the organization; therefore convincing people to volunteer knowledge, and teams to share their knowledge with other teams is one of the critical success factors for KMS deployment. Generally organizations reward employees for their individual performances, and there is need for a shift in this culture to encourage staff to share their knowledge through the KMS instead of hoarding knowledge. There is also need for an organizational culture where innovation and positive criticism are justifiable and encouraged in order to motivate knowledge sharing and creation (Weber, 2007).

There is need to demonstrate the business value of KM through the use of metrics, as well as take responsibility for KM and bring together all the stakeholders involved in KMS development (for example the knowledge workers, technical staff, documentation team, database administrators), and effective KMS implementation. The use of KMS metrics in an organization is growing in importance as organizations seek to improve long term growth and success of KMS, as well as continue to gain top management support for knowledge management system development and deployment. Alavi and Leidner (1999) argue that KM systems may fail because they are not able to demonstrate their effectiveness, which is a requirement for most organizations in order for KMS to continue to receive support.

The managerial responsibilities for knowledge management include enabling knowledge collection, embedding knowledge in organizational processes, monitoring the transfer of knowledge as well as creating the infrastructure for knowledge management. Disterer (2001) also highlights the important of enforcing these responsibilities for an organization to have a KMS which contribute to organizational goals. During KMS deployment, there is need for a decision making process to determine the knowledge to include in the KMS. This process needs to be continually refined, through a lessons learned process, as users' actions are observed and trends begin to emerge, so that there are improved situations in the future. The

design of the KMS therefore needs to be kept flexible to accommodate the lessons learned, and the KMS needs to be able to address complex and critical organizational issues on demand and in real time (El Sawy & Majchrzak, 2004).

The designers of an organization's KMS also need to be aware that enhanced knowledge creation and sharing will not result from providing the KMS users with too much information. The omission of unimportant data might be as important as concentrating on the important data. There is therefore need to balance information overload and potentially useful content when an organization is setting up a KMS. For center-periphery organizations, both availability and lack of diversity can be a challenge for the organization's knowledge management systems. The lack of diversity in a KMS would result in less valuable knowledge. The availability of diversity could also make it hard for the KMS users to find the knowledge they need, due to lack of a shared language and too much information in the KMS, both of which work against the KMS's ability to provide new knowledge to the users.

The results of the KMS can therefore not be easily predicted from the KMS inputs, the outputs largely depend on the interactions of the users with the system, as well as the interactions within the system itself. It is also difficult to determine beforehand what knowledge will be required when, where and in what format and a KMS should therefore be developed in ways which address these organizational complexities and different identities (Malhotra & Gold, 2001).

The issue of KMS is also contextual, knowledge flows and interfaces which are effective in one organization or location may be ineffective in another, and the knowledge flows are also continually changing with organizational changes. All KMS should have the ability to "pull" knowledge from the system, however the system should only "push" knowledge to users based on their areas of interest. If a KMS is deployed in a context where users do not have the skills to use it and do not believe that knowledge reuse is beneficial; the deployed KMS will likely force users to divert from their normal activities (Atwood, 2002).

Hahn and Subramani (2000) argue that homogeneity of system users is not suitable in a KMS; the value and purpose of the knowledge in the KMS differs according to perspective. This highlights the need to have multiple views in one KMS as well as value the organization's knowledge diversity and motivating KMS use by supporting the distinctive needs of the different users (Woodman and Zade, 2012).

The technological infrastructure deployed to support the KMS needs to remain effective in the face of highly dynamic technology; the KMS should be able to evolve with the changing organizational needs and the organization's operating environment. Whilst KMS success may be more related to organizational culture, an integrated and integrative technology is one of the key drivers of knowledge management systems in an organization. The technological implementations are considered according to how they are likely to support integration of the KMS' organizational, social and technological aspects, as well as the cost and complexity of the technologies. A KMS therefore does not involve IT only, there is need for the organization to design the knowledge flows and structures which they need to achieve the knowledge management related organizational objectives ((Woodman and Zade, 2012).

The current perception of Web 2.0 technologies is that they can enhance knowledge management in globally distributed settings, through interactive collaboration, content management and networking. The tools therefore facilitate organizational knowledge processes, including knowledge identification and sharing (Zheng et al, 2010). However, there is still need for organizations to address the challenges which are caused by the distributed work settings; including cultural differences, communication barriers, and geographical distance. Cultural influence has also been described as the top challenge for KMS in organizations which are in a distributed setting.

The availability of a KMS in an organization may lead to the organization not being innovative as they continue to refer to existing knowledge in the KMS, without creating any new knowledge. There is also a risk of staff losing capacity to learn as they rely more on readily available explicit knowledge in the organizational KMS compared to tacit knowledge (Hahn and Subramani, 2000).

2.9 Conclusion

A review of KMS literature reveals multiple KMS definitions. The chapter discussed how organizations can implement KMS for success, including the importance of considering factors such as technology and feasibility study before implementation. Some of the ways through which the critical process of KMS adoption, acceptance and assimilation can be improved were also described. The review of existing literature also shows the general state of KMS in multinational organizations, including the types of KMS which are normally found in these types of organizations. The chapter also highlights why it's important for organizations

to invest in cultural, technological, managerial, and organizational issues before they can realize KMS benefits.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 Introduction

Knowledge management systems, whilst the most advanced means to help workers involved in knowledge management, do not automatically result in success. They could be an unnecessary cost, unless if they are commonly shared and everyone in the organization is participating in the knowledge management processes. According to Newell (2009), a lot of organizations are putting a lot of effort into codifying knowledge, so that the right knowledge can be provided to the right people, at the right time. KMS increases organizational memory by making knowledge available as well as easy to access (Alavi & Leidner, 2001).

Knowledge in itself is not valuable; it only becomes valuable when it's applied to specific tasks (McDermott, 1999). Knowledge management systems represent how organizations can harness and use the knowledge and expertise that members have to solve problems. The KMS are designed to make codified knowledge available, and employees are expected to apply the knowledge from these systems and to share information about past experiences as they perform their work (Wickramasinghe, 2003). Today's sophisticated Information Technology (IT) systems advance the storage of knowledge in knowledge management systems, and also increases the retrieval possibilities for the employees.

There is need to define knowledge and understand what it means before we seek to understand knowledge management systems. According to Newell et al (2009:3), "philosophers have wrestled over what knowledge is since the classical Greek period", but two views which stand out are the epistemology of possession and the epistemology of practice. Knowledge is what enables the owner to find meaning in data and information, based on experiences acquired through life as well as cognitive capacity. Swan (2008) also defines knowledge as being able to discriminate within and across contexts. Knowledge is also a combination of information and data, plus expert opinion, skills and experience, resulting in a valuable asset for decision making (Chaffey & Wood, 2005). Orlikowski (2002:249) describes knowing as an "ongoing social accomplishment, constituted and reconstituted as actors engage the world in practice"; the emphasis is on connecting different groups to accomplish tasks rather than knowledge capture, conversion and transfer.

3.2 Two Perspectives on Knowledge Management Systems

Most KMS are mainly based on the epistemology of possession knowledge approach, and therefore assumes that knowledge can be captured and moved across people, places and time. It is best however for this approach not to be exclusively applied, but to be complemented with the practice-based approach which allows observation and engagement during knowledge creation (Newell et al, 2009).

3.2.1 The Practice View

According to the epistemology of practice, due to the different beliefs and experiences, and because knowledge involves interpretation and may be highly variable, there is no straightforward way to transfer knowledge to people through ICTs. This view highlights how important it is to have shared understandings and attitudes as well as some type of relationships, in knowledge processes. Knowledge can be shared more easily in homogeneous beliefs and understandings instead of vice-versa. Center-periphery organizations, whose beliefs and understandings are not always homogeneous, need to find ways to make their knowledge management systems work even in these difficult settings.

The ability of knowledge to lead to organizational improvements is highly dependent on how tasks, actors and contexts come together. “The failures of many initiatives that have attempted to capture and transfer individual knowledge have helped fuel the shift towards accounts that take as their focus the development of processes and enabling contexts capable of supporting knowledge work. This shift can be seen in organization theories which focus on knowing as a social and organizational activity” (Newell et al, 2009:14).

In the practice perspective, knowledge flows where practice is shared and sticks where practice is not shared. Resistance to change continues to be a challenge for knowledge flow in a KMS. When it's too difficult to change current practices, people might not be willing to change even if the new practice is better. Organizations structures have evolved in pace with changes in technology that break down traditional barriers of time and space. Organizations lose opportunities for causal knowledge sharing and learning that happens when everyone is in the same place when organizations are structured around virtual teams which are in different places. These limitations of structural approaches have resulted in Communities of Practice (CoPs) becoming more prominent (Newell et al, 2009).

Web 2.0 technologies, including include Facebook, LinkedIn and YouTube, provide the platform for the practice view of knowledge management to work. In addition to allowing the sharing of outputs of knowledge work, they also make visible the practices of knowledge workers and interdependencies between practices (McAfee, 2006). As the potential of the Web 2.0 technologies to support knowledge work becomes more fully understood, many organizations will start acknowledging the limitations of repository knowledge management systems and shifts towards dynamic environments.

3.2.3 The Possession view

Knowledge capture, storage and sharing in organizations is not improved by knowledge management systems, rather it's how it's used as well as the perceptions of the users of the system. A number of factors work against the possession view of knowledge management, and the result is that important knowledge is not even in organizations' KMS despite efforts to capture knowledge these systems (Newell et al, 2009). Continuous organizational change also means that processes and procedures might be out of date by the time they are documented. There is therefore need for the knowledge management systems to be continuously updated so that those who are referring to the systems do not end up with wrong knowledge.

Sometimes it's also cheaper to learn organizational processes by trial and error than codifying it for future reference. There are also chances that the codified knowledge will never be referred to because of the amount of effort required. Even though the knowledge has been codified at a high cost, users may prefer to learn their own way or use their previous knowledge to do certain activities. This might apply more to experienced users who are coming in from other organizations or users who have been in organizations for a long time and are resisting change.

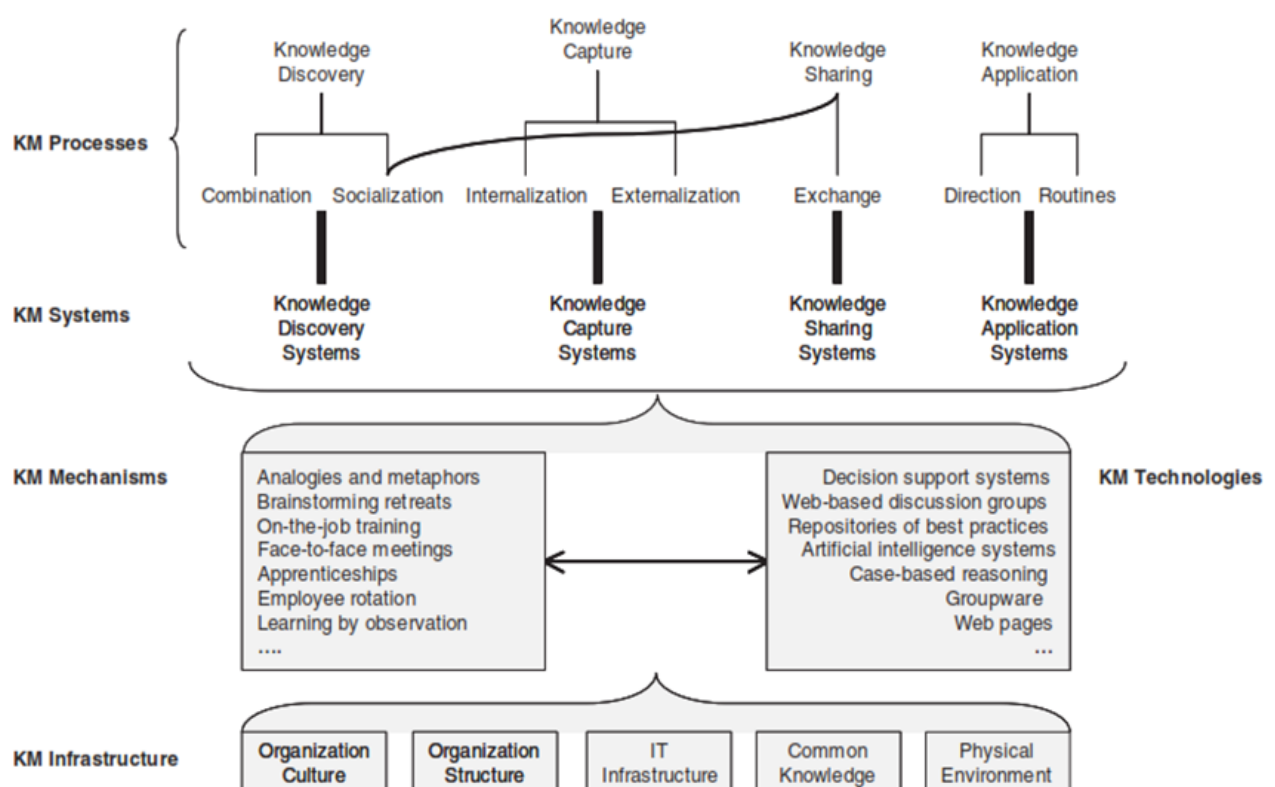
There is also need for organizations to be context-aware, especially where there are cultural differences. Culture has a huge impact in an organization's knowledge management systems and there is need for ways to make sure knowledge from different cultural backgrounds can be shared widely. The knowledge can even be adapted to be relevant to each context or culture, as long as the interpretation of the knowledge remains the same. Knowledge can be too sensitive to codify and pass on to others formally, and it means this type of knowledge is easily lost in organizations. Relationships in organizations also affect which knowledge gets

shared and which doesn't, employees who feel loyal to each other will not likely share any negative knowledge they may have about their friends (Newell et al, 2009).

3.3 Knowledge Management Solutions Framework

In order to understand how knowledge is managed with a KMS in a center-periphery organization, we need to distinguish between knowledge management solutions and foundations. "Knowledge management solutions include knowledge management processes and systems, whilst knowledge management foundations are the broad organizational aspects that support knowledge management and these include knowledge management infrastructure, mechanisms and technologies" (Beccerra & Sabherwal, 2010:41). The framework, shown in Figure 2.2, shows the relationship between the knowledge management systems and the knowledge processes, as well as the mechanisms, technologies and infrastructure which support the different types of KMS.

Figure 3: Knowledge Management Solutions, Source: Beccerra-Fernandez & Sabherwal, (2010:68)



The framework will be used to analyze and recommend the types of KMS which are most applicable and useful to center periphery organizations, together with the most applicable knowledge processes, technologies, mechanisms and infrastructure for each identified type of KMS. This will allow center-periphery organizations to focus their development and

acquisition efforts specifically on technologies and mechanisms which are appropriate for them and to build mutually complementary KMS over time (Beccerra & Sabherwal, 2010).

Once organizations understand the synergies which exist between their knowledge management systems and include them in their strategies, they will be able to leverage their knowledge assets and implement better knowledge practices, leading to improved organizational performance. This understanding will also enable center-periphery organizations to solve some of the top issues in knowledge management identified by King et al (2002), including how to identify knowledge that should be captured in KMS, how to verify the relevance and legitimacy of knowledge contributed to a KMS, how to motivate individuals to contribute knowledge to a KMS, and how best to design and develop a KM system (King et al, 2002).

3.3.1 Knowledge Management Infrastructure

Knowledge management infrastructure supports knowledge management mechanisms and technologies; its five major components are organization culture, organization structure, information technology infrastructure, common knowledge and physical environment (Beccerra & Sabherwal, 2010). Management has a critical responsibility to pay attention to both the structural and cultural conditions in the organization, and one of their key roles is to attract and retain knowledge workers. Sustaining a workforce who is willing to create and share knowledge is crucial for an organization's strategy; the work environment has to be good for knowledge workers, especially opportunities for collaborative work, as well as organizational structures and cultures which are conducive for knowledge work. There is therefore need to sustain an environment that promotes innovation and creativity, allowing the knowledge workers to create and share knowledge (Newell et al, 2009).

3.3.2 Organization culture

According to a research by Friedman (1977), cultural conditions that promote responsible autonomy allow employees to advance the organization's interests as well. Nonaka (1994) highlights diversity in the workplace as a significant factor for innovation; knowledge creation is increasingly relying on the combination of knowledge from different places.

Organizational leadership is responsible for developing as well as reinforcing, an organization's culture if an organization expects improvements in knowledge productivity and quality, including recognizing and rewarding individuals' innovation efforts. The behavior

and core values of an organization's leadership can shape its culture; the beliefs will permeate the organization over time and influence the behavior of the rest of the employees. One way of building on organizational culture which supports sharing of knowledge is providing incentives, either formal or informal (Hendriks, 2003).

Symbolic leadership is important for creating and sustaining a strong organizational culture. Leadership have the ability to shape organizational culture through primary and secondary embedding mechanisms, which reflect the core values of leadership, including organizational policies, practices and mission statements. Mechanisms rewarding knowledge sharing would need to be introduced in an organization which highly values knowledge sharing. When this is done in conjunction with other mechanisms, knowledge sharing is encouraged and promoted throughout the organization.

An organizational culture which does not encourage knowledge sharing is the second most important challenge in knowledge management (Dyer and McDonough, 2001). Whilst getting people to participate in knowledge sharing is the hardest part, a supportive organizational culture can motivate employees to understand the benefits of knowledge management as well as set aside time for knowledge management activities.

Understanding the value of KM practices, management support for KM, rewarding knowledge sharing, and encouragement of interaction for knowledge creation and sharing, are all attributes of an enabling organization culture. A culture which encourages competition between teams or individuals within an organization could inhibit knowledge sharing practices, as no one within the organization is willing to share knowledge with competitors (Armbrecht et al, 2001).

Organization Structure

“Structural constraints in knowledge work include the development of organizational best practice templates, monitoring of knowledge workers' time and organizational growth” (Newell et al, 2009:53). The development of an organization's norms and best practices may end up stifling innovative behavior; as their use spreads to the entire organization, users will start assuming they are mandatory and the likelihood of staff developing new tools is significantly reduced. Starbuck (1992) also highlights the tendency of organizations to continually expand, increasing the hierarchy layers and support staff numbers exceeding experts in the organization. In most cases this has been counterproductive to the

organization's innovative efforts as the experts begin to lose their credibility in the organization.

An organization's structural conditions have to emphasize on flexibility as well as self-managed team working in order to facilitate knowledge work (Newell et al, 2009). Nonaka (1994) highlights the importance of redundant time in order for employees to be innovative; where employees' time is closely monitored and all of it has to be accounted for, it's most likely that staff will not invest any time in creating or searching knowledge as knowledge workers generally resent the monitoring and control of their work.

According to a research by Henry Mintzberg (1980), a loosely coupled organizational structure is considered to provide the right conditions for staff to experiment with ideas, as well as do some creative and innovative work. Even subtle control of knowledge workers in the organization may have negative effects on morale and performance of both the individual and the organization (Robertson and Swan, 2004). Reporting relationships affect the people with whom each individual frequently interacts and where they are likely to transfer knowledge. Knowledge sharing is also likely to be better in decentralized organizations where layers are eliminated and responsibility is placed with the individual, thereby increasing size of groups reporting to each person. Specialized structures and roles that specifically support knowledge management within organizations can also facilitate knowledge management. Knowledge management efforts are likely to be pushed forward when there is a team which is working on that full time within the organization than when it's being done as a part-time role (Becerra-Fernandez and Sabherwal, 2010).

Information Technology infrastructure

Research has shown that organizations' knowledge management initiatives are mainly dominated by implementation of ICTs. Knowledge Management Systems (KMS) involve the use of Information Technology (IT), and many organizations assume that investing in information technology will automatically improve their knowledge management systems. In as much as introducing technology on its own to support knowledge work will not lead to the desired result, technology does have an important role to play in knowledge work, more so in globally distributed organizations (Newell, 2009). However, it is generally very difficult to predict the results of introducing technology to support knowledge work in an organization, mainly because of the complexity of the relationship between technology and the organization.

Whilst many assumed that through the introduction of ICT geographical distance would no longer be a barrier for knowledge work, the adoption of new technology does not automatically result in conditions which are more conducive to knowledge work. Assuming that technology will definitely result in organizational change ignores the ability of human factors to influence technological and organizational choices.

Because technologies are open-ended and the knowledge workers have the ability to enact technologies in ways that suit their interests, the technology might not be used at all in the organization. Most likely because the knowledge workers do not want it to interfere with existing practices and they want to continue working the way they were before the new technology was introduced (Orlikowski, 2000). The knowledge workers have the ability to resist technology when it's introduced, and organizations may need to negotiate technology to support knowledge work with the users first. Therefore, whilst technology is an important critical success factor, it is also important to achieve a balance between its use and the social mechanisms so that technological advances do not lead to people ignoring the social aspects of knowledge management.

IT's function in the KMS is to provide a seamless pipeline for the flow of explicit knowledge, and whilst it does not need to be complex to provide significant benefit, its absence will hinder the effectiveness of knowledge management systems. Organizations' information technology infrastructure facilitates knowledge management (Becerra-Fernandez and Sabherwal, 2010). The infrastructure provides capabilities in four important aspects of knowledge management; that is reach, depth, richness, and aggregation.

Reach refers to the number of locations an IT platform is capable of linking, with the ideal being anyone, anywhere, connected. Depth focuses on the detail and amount of information that can be effectively communicated over a medium, and technological advancements in channel bandwidth have resulted in progress in this area. Information technology also enhances ability to store and process information, enabling aggregation of large data volumes from multiple sources (Becerra-Fernandez et al, 2010).

Information technologies also exist which focus specifically on knowledge management including artificial intelligence technologies, Web 2.0 technologies, video conferencing and expertise locator systems. It's very important that the knowledge management technologies adopted have the ability to scale across the global organization; the different communities within the organization should be able to communicate with each other (Fitzgerald 2008).

Physical Environment

The environment can encourage knowledge management by providing opportunities for employees to meet and share ideas (Becerra-Fernandez and Sabherwal, 2010). Research has found that most employees gained most of their work related knowledge from informal conversations around water coolers rather than formal training and manuals and organizations are therefore creating spaces to facilitate this kind of knowledge sharing. There is now a shift towards careful management of office locations to facilitate knowledge sharing, with some organizations favoring the open-plan office which maximize the chances of face-to-face interaction among employees who might be able to share useful knowledge with each other.

3.3.3 Knowledge Management Technologies

Whilst they have difficulty capturing tacit knowledge, knowledge management technologies excel at capturing employees' explicit knowledge. The technologies support knowledge management systems whilst benefiting from knowledge management infrastructure, and they are described as "information technologies that can be used to facilitate knowledge management" (Becerra-Fernandez and Sabherwal, 2010:41). It is essential to select tools which are aligned directly with the organization's knowledge management strategy. Broad categories include knowledge storage, collaboration, search and retrieval and communication tools.

Knowledge storage tools allow organizations to electronically collect and store information, and the internet makes this knowledge globally accessible. Search and retrieval tools allow users to search for and find information within a knowledge base easily. Some of the tools include features which allow users to locate specific expertise within an organization; this is very useful for a center periphery organization where experts may not be in one place.

Collaboration tools enable distributed teams to work together, accelerating and improving development, innovation, problem solving and decision making. Communication tools can be classified into asynchronous (e-mail) and synchronous (chat and video conferencing). These tools help to improve knowledge sharing, interaction and transfer of information between employees in an organization.

3.3.4 Knowledge Management Mechanisms

Knowledge management mechanisms "enable knowledge management systems to involve some kind of organizational arrangement" (Becerra-Fernandez and Sabherwal, 2010:49).

They are most effective at capturing employees' tacit knowledge, and many of them involve interaction with humans and transfer of contextual knowledge. Common techniques include mentorship program, after action reviews, regular meetings, communities of practice, retreats and employee rotation. The techniques are summarized below.

Employee rotation is a very widely used knowledge management mechanism in center periphery organizations as they take advantage of the diversity within the organization to share knowledge. Staff get temporary duty opportunities to work in other field offices for a few weeks to months, gaining experience in a different setting as well as sharing their knowledge. Through this knowledge management technique, employees begin to trust each other and start to share their knowledge with each other. Most center periphery organizations also provide opportunities for field office staff to work at headquarters; providing a platform for them to better understand the organizational culture as well as possibilities to learn as a result of work-related mobility. According to Bresman et al's (1999), social interaction is important for knowledge transfer; employee rotations are important mechanisms for achieving a common set of beliefs within an organization, personal relationships such as trust, respect and friendship increase the motivation to engage in the exchange of knowledge and teamwork.

Mentoring allows experienced senior employees to share their knowledge with junior employees. For organizations with high staff turnover, mentoring is used as a mechanism to teach incoming staff about the organization's operations as well as to preserve institutional memory by sharing information and experience. Developing the right knowledge, skills and abilities is one of the main requirements for knowledge management success; people learn most and best from their co-workers, by experience, or by doing activities (Biygautane and Al-Yahya, 2011). Mentoring enables sharing knowledge not just about the organization's work, but also in areas such as leadership, career growth and other knowledge which is mostly implicit and cannot be found written anywhere. The power of collaboration also allows innovation to unfold from the constant conversation and side-by-side work. The key element in this knowledge sharing process is the extent to which the learner acquires useful knowledge and is able to use it in their own operations (Minbaeva et al, 2003).

Regular meetings are meant to bring together employees from different offices; the interaction allowing employees to exchange ideas as well as transfer knowledge between different areas of the organization. The meetings are generally used as a platform for all team members to

share their ideas about challenges within the team as well as learn from their colleagues. In a center-periphery organization, employees can share knowledge and best practices from both settings, and the knowledge from these meetings can then be shared with all staff as appropriate. Regular meetings can strengthen personal relationships within the organization; whilst in the early stages knowledge transfer is limited to unidirectional, as trust is established, a high level of reciprocal knowledge starts to occur. The shared interpretations and shared language which are established during the meetings can provide the foundation for communication between the center and field offices.

Retreats are used to bring employees together to discuss strategy, challenges, etc. Even where there is a shared culture, effort is still required to develop shared language and experiences; both of which facilitate bidirectional knowledge flow. This mechanism creates knowledge networks in an organization, allowing experts to come together to share and amplify their knowledge. Due to the geographical and cultural distances which exist between the center and the periphery, even where related competencies exist, the tendency for competence transfer between staff is reduced because the geographical distance between them curtails opportunities for social interaction.

After action reviews involve discussion of activities which enable the individuals involved to learn for themselves what happened, why, what went well, what needs improvement and what lessons can be learned from the experience. The results of these discussions can be explicitly documented and shared with a wider audience as best practices. These can provide a useful knowledge base which organizations can use for planning, programming, as well as bringing better performance.

3.3.5 Knowledge Management Systems

According to Becerra-Fernandez and Sabherwal (2010:41), “knowledge management systems are the integration of technologies and mechanisms that are developed to support knowledge management processes”. A combination of mechanisms and technologies are used by each knowledge management system to support the processes.

Knowledge Discovery Systems support the development of new knowledge, both tacit and explicit, from existing data or information or from the combination of existing knowledge. Combination enables existing knowledge to be re-contextualized to produce new explicit knowledge, whilst socialization enables the discovery of new tacit knowledge through joint activities.

Knowledge Capture Systems enable both tacit and explicit knowledge which resides within people, artifacts, or organizational entities to be retrieved, through internalization and externalization. The captured knowledge can be either inside or outside organizational boundaries. Storytelling is increasingly being used by organizations as a knowledge capture mechanisms.

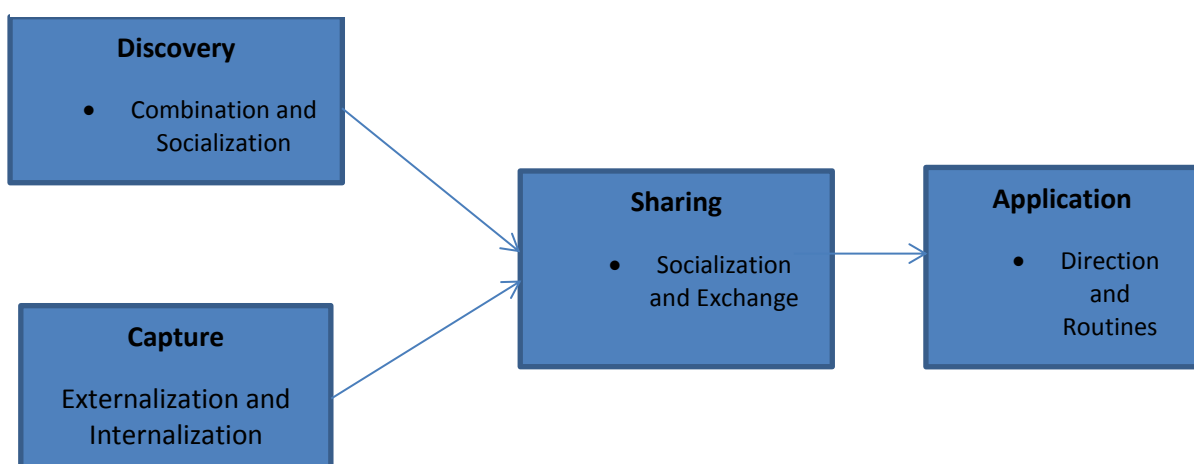
Knowledge Sharing Systems enable both tacit and explicit knowledge to be communicated to others. Common examples of knowledge sharing systems include expertise locator systems and lessons learned systems; exchange and socialization support these types of KMS.

Knowledge Application systems make it possible for individuals to use the knowledge possessed by others without learning or acquiring that knowledge. Directions and routines typically support these types of knowledge management systems.

3.3.6 Knowledge Management Processes

Knowledge management processes are the broad processes that help in discovering, capturing, sharing and applying knowledge (Becerra-Fernandez & Sabherwal, 2010). Knowledge Management relies on four main kinds of knowledge management processes, which are supported by seven sub processes. The accumulated knowledge is of less significance than the processes needed to continuously revise and create knowledge. Knowledge management processes directly improve organizational processes, producing intermediate outcomes such as better decisions and organizational behaviors, which in turn lead to improved organizational performance. The improvements are the primary basis that organizations use to judge the value of its knowledge management initiatives. The figure below shows the knowledge management processes and the sub processes which support them.

Figure 4: Knowledge Management Process. Source: Becerra-Fernandez, 2010



Knowledge Discovery (Creation)

Knowledge discovery is “the development of new tacit or explicit knowledge from the synthesis of prior knowledge” (Becerra-Fernandez and Sabherwal (2010:57). According to Nonaka’s SECI model, knowledge creation is a spiraling process of interactions between explicit and tacit knowledge types; the knowledge from individuals changes to organizational knowledge through a continual cycle of conversion between tacit and explicit knowledge. During the knowledge creation process, focus is usually inside the boundary of the organization and its partners; as the spiral expands beyond organizational boundaries, the knowledge created by universities, suppliers and customers interacts with each other in amplifying the knowledge creation process.

Combination synthesizes multiple bodies of explicit knowledge to create more complex sets of explicit knowledge (Nonaka, 1994). New explicit knowledge is created through communication, integration and systemization of multiple streams of explicit knowledge. Mechanisms that facilitate combination include collaborative problem-solving, joint decision making and creating documents collaboratively (Nahapiet and Ghoshal, 1998).

Socialization integrates multiple streams of tacit knowledge to create new knowledge (Nonaka, 1994). This process usually happens through joint activities, where different perspectives and experiences are brought together. Mechanisms which facilitate socialization include employee rotation, initiation processes for new employees, retreats and apprenticeships. Whilst this process enables innovation through the creation of new knowledge, too much emphasis on it could reduce efficiency in the organization.

According to Newell (2009), organizational knowledge creation starts from an individual, and the knowledge spiral signifies the movement of knowledge from being in possession of an individual to becoming an organizational resource. A shared knowledge space must however exist between individuals in an organization for there to be this continuous conversion between tacit and explicit knowledge (Davenport and Prusak, 1998).

Knowledge Capture (Storage/Retrieval)

Knowledge capture refers to the process of retrieving explicit or tacit knowledge that resides within people, artifacts or organizational entities, from within or outside an organization’s boundaries. Knowledge might reside in an individual’s mind without them realizing it, and it might be in explicit forms but only a few people are aware of it (Becerra-Fernandez and

Sabherwal (2010). It is therefore important for this knowledge to be captured so that it can be shared through a KMS.

Externalization involves converting tacit knowledge into a more accessible and comprehensible form for individuals, and the mechanisms which facilitate this process include articulation of best practices and bulletin boards. Internalization means creation of tacit knowledge from explicit knowledge; employees expand their own knowledge base by internalizing organizational knowledge, and they are stimulated to create new tacit knowledge through observation and interpretation of the exposed information on a KMS. Mechanisms which support internalization include learning by doing, on the job training, learning by observation and face to face meetings (Nonaka and Takeuchi, 1995).

Knowledge capture facilitates knowledge sharing through conversion from tacit to explicit and vice versa, but it has its disadvantages. It might lead to reduced attention to the creation of knowledge in the organization as users focus on knowledge capturing, biased decision making due to outdated knowledge and may also stiffen the organization's flexibility to change. The storing and reapplying of the captured established procedures however prevents duplication of work, thereby saving organizational resources. There is also room for knowledge loss during the process of conversion from tacit to explicit, and vice versa; it is therefore important for organizations to prevent such losses of knowledge by codifying and storing the knowledge for future use. For an organization to benefit fully from the knowledge capture process there is also need for the KMS to be kept relevant to the organization's needs as well as up-to-date (Alavi & Leidner, 2001).

Knowledge Sharing

Knowledge sharing is defined as "the process through which knowledge is communicated to others" (Becerra-Fernandez and Sabherwal (2010:60). The knowledge sharing process takes a perspective in which externalization of knowledge in the form of IT artifacts play an important role, therefore training, guiding and equipping staff with computer-based tools that support knowledge-sharing in a user-friendly manner are a must. It also means effective knowledge transfer, that is, knowledge recipients can understand it well enough to take action based on it (Jensen and Meckling, 1996). Knowledge must be shared to have wide organizational impact, and the process of knowledge sharing may take place across individuals, groups, departments or organizations. The shared knowledge may be used

through elaboration, facilitating innovation, collective learning and collaborative problem solving (King, 2005).

The socialization sub process facilitates the sharing of tacit knowledge, whilst exchange is used to communicate explicit knowledge (Grant, 1996). Mechanisms which facilitate socialization include chat groups; an individual is able to explain their knowledge to the rest of the group. Presentations, manuals and memos on the other hand, facilitate exchange. Whilst knowledge sharing enables efficiency through redundancy reduction, too much of it can lead to knowledge leaking from the organization and reduce the benefits of the focal organization.

Knowledge Application

This process depends on the availability of knowledge, which is directly related to the effectiveness of the processes of knowledge discovery, capture and sharing. Knowledge is re-identified, applied and then converted to personalized and routinized knowledge during the application process. When the available knowledge is used in decision making and task performance, it can make significant contributions to an organization's performance. Knowledge utilization benefits from routines and direction, both of which do not involve the actual transfer of knowledge between individuals, only transfer of applicable recommendations in each context (Grant, 1996).

Knowledge application allows individuals to utilize knowledge possessed by others without having to acquire or learn that knowledge. Mechanisms which facilitate direction include hierarchical relationships in organizations, help desks and support centers. Routines involve the utilization of knowledge embedded in procedures, rules and norms that guide future behavior; they rely on constant repetition (Grant 1996). Mechanisms which support them include organizational policies and procedures, work practices and standards. Whilst the application of knowledge enables efficiency, too much emphasis on it could reduce knowledge creation, which could result in reduction in the organization's effectiveness and innovation.

3.4 Communities of Practice as a model

Communities of Practice (CoP) are increasingly regarded as an important part of the organizational structure, which is suitable for practices, knowledge development, and sharing for individuals who have common interests in developing knowledge in a specific field. One

of the common challenges for managers in organizations is how employee know-how can be shared organization wide, and CoP have been developing steadily to provide a platform for individuals to develop and share knowledge within the organization as a result of this challenge (Probst and Borzillo, 2008). CoP make it easier for existing knowledge to be reused and improved in the organization, allowing organizations to realize some strategic advantages by more fully exploiting existing human capital to respond to changes (Tsai and Ghoshal, 1998).

CoPs are defined as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an on-going basis” (Wenger et al, 2002:4). They are responsible for gathering, evaluating, structuring and disseminating domain knowledge, as well as providing opportunities and developing members’ capabilities by sharing tacit knowledge. The CoP sets its own agenda, finds own shape and because it is associated with the production of collective knowledge, it is sustained by the interest and passion of participants.

CoPs are not necessarily harmonious, but there is a common and coordinated practice, generic understandings are created and shared and negotiations are conducted (Brown & Duguid, 1998). They offer a means of exploring collective knowledge for epistemologists, and they offer opportunities to derive frameworks for organizational knowledge creation at a number of levels in the interest of improved productivity for managers. CoP provides a locus of problem solving in ad hoc unforeseen contingencies, cumulating knowledge is embedded in the final product, which embodies the knowledge of the group.

CoP allow knowledge flows through both virtual forums and specialist roles in the network, which allows solutions to be propagated through the community at much higher speed compared to other knowledge management platforms, thereby increasing organizations’ efficiency. According to Lesser & Storck (2001), the connections, the relationships and the shared context among community members generate social capital, which then leads to behavioural changes, which in turn positively influences business performance. CoP members are not only willing to share their ideas with others, but also to tap on the expertise of others in order to refine their ideas as well as explore new ones.

3.4.1 Organizational knowledge and Communities of Practice

CoPs are often examined from a sociable and productive perspective, but not from the Knowledge Management (KM) in an organizational context perspective. However the KM

view of CoP is necessary if KM structures, processes and guidelines are to be recognizable and successfully implemented by management and members of organizational CoP. According to Davenport and Prusak, it's important to integrate knowledge management with organizational culture, strategy, process and behavior. The CoP therefore has to be aligned with the organizational goals, management and infrastructure; including doing an analysis of which CoP are relevant for the organization.

Organizations have an advantage over their competitors when they are able to use knowledge to improve efficiencies and drive innovation; however, one of the challenges for today's organizations is how to use their intellectual assets and information more effectively (Tapscott, 1999). KM has emerged as an overarching strategy to enhance knowledge creation, transfer, use and circulation in order for organizations to be innovative and improve performance; and this strategy involves CoP creation. The building of knowledge generation capabilities through CoP creates an organization which is able to quickly respond to new challenges, a major organizational success factor in the globalized world.

The main interest of knowledge management is turning tacit into explicit knowledge, and back into tacit knowledge, continuously expanding the cycle of knowledge growth and regeneration and resulting in improved organizational performance. CoP provide an effective way of harnessing knowledge, growing the organization's knowledge base and sharing knowledge to improve organizational efficiency, especially if networked and leveraged across a number of individuals. The better use of individual and collective knowledge in the organization facilitates improvements to the organization's capabilities, efficiencies and competitive advantage; CoP are practical applications for enabling and encouraging knowledge and its use in an organization.

CoP's freedom from goals and deadlines make them more hospitable to knowledge sharing compared to traditional organizational subgroups. They offer opportunities to span departmental and organizational boundaries, which would not normally allow insight to emerge when departments run into difficulties. Whilst CoP have boundaries, it's possible for new connections to be made in the CoP boundary areas. According to research, CoP regularly makes use of knowledge from experts outside of their own CoP or organization. Generally these experts have a very rich knowledge content of their practices, and when invited to participate in a CoP, both the members and the organization are likely to benefit from significant improvements in their existing best practices through the knowledge shared by the

experts. The practice also motivates more active participation by CoP members as they want to benefit from the experts' knowledge. Where the best practice shared fit into the CoP's objectives, the members can quickly adopt the best practice. And where it does not necessarily fit, it still provides new perspectives and stimulates members to generate new ideas or refine existing practices.

Participating completely in a CoP needs a show of knowledge of the area involved, whilst learning in the CoP involves the ability to have a meaningful experience. CoP are distinguished from other groupings by the mutual engagement, mutual accountability and emergence of meaning in practice (Wenger, 1998). CoP flourish when participants are willing to share their knowledge, and whilst personal interactions can help foster relationships and trust within a CoP, members do not have to be in the same location. Conversing and learning from each other through informal channels can be highly effective for knowledge generation, and CoP have the ability to yield positive outcomes as participants share knowledge and experiences in free-flowing and creative ways.

As a knowledge management strategy, CoPs provide benefits both to the organization and the participants. They allow easy knowledge diffusion, and for organizations wishing to take advantage of their knowledge assets, they are a valuable tool. They enable leveraging of the organization's knowledge, which is widespread for center-periphery organizations, resulting in a smaller learning curve for new staff, generation of new ideas which help staff to work smarter, and prevents the reinvention of the wheel as well as repetition of past failures (Storck and Hill, 2000).

Because people cannot be forced to learn or share knowledge, there is need for organizations to get the message across that knowledge and learning are crucial for an organization's sustainability. KM strategies need to be linked to people, building reward and recognition programs to encourage employees to share best practices, strategies and ideas. Lesser and Prusak (2000) list access to information and knowledge shared by others as a tangible reward of participating in knowledge sharing activities; organizations therefore need to come up with policies which prevent free riding by CoP members.

According to Davenport and Prusak (1998), knowledge sharing is likely to be encouraged in employees who know that it's a requirement of their jobs, and organizations can support this by making knowledge sharing part of everyone's job. Knowledge sharing will not happen, unless the capturing and sharing are built into work processes (O'Dell and Grayson, 1998). In

addition to reward schemes, making knowledge sharing part of each individual's job within the organization, encouraging employees to work in groups as communities, allowing risk taking and experimentation, and providing tools for these activities can also encourage knowledge sharing and ensure the continued vitality of the community.

The social infrastructure of an organization refers to the networks of contacts, and organizational knowledge is normally transferred through these networks. The level of knowledge diffusion in the organization may depend on the social capital established in professional and working networks, however this varies across communities. CoPs are sometimes strengthened by the weak ties between the participants, as the less intense networks are more wide-ranging, offering more opportunities to learn from each other. Organizational knowledge is distributed and spread across contexts and organizational members and there is need for users at the periphery to find more and more ways of getting connected and inter-relating the knowledge that is spread out in the organization (Tsoukas, 1996).

CoPs are playing an increasingly important role in today's learning organizations; they foster knowledge development and creative interactions among experts. A structured process of KM is essential to assure the efficiency of CoP, including the measurement of the KM processes in the CoP to ensure knowledge handling is efficient and effective. To improve the CoP operations and knowledge management, best practices and benchmarks can be systematically applied; resulting in useful and practical guidelines for other organizations using CoP.

A COP brings together individuals with common interests and problems, providing a platform for them to gain more knowledge and expertise through interaction with the other members of the COP. A COP's success is therefore generally measured by the practices developed and exchanged within the COP which have helped to improve organizational performance (Wenger et al, 2002). A COP is successful when members exchange specific knowledge or experiences which contribute to developing know-how in a specific field.

3.4.2 COP Success Factors

CoP can be made up of large numbers of people, but they usually have a core of participants, whose passion for the topic energizes the community and who provide intellectual and social leadership (Wenger & Snyder, 2000). CoP utilize a previously under-emphasized collective learning approach, where tacit and experience based knowledge is shared through storytelling and social interaction. The CoP, whilst they are affiliated with a knowledge management

program, can act independently. Their strength is self-perpetuating; they become stronger through knowledge generation, and they are acknowledged to be a means of developing and maintaining long-term organizational memory.

Whilst CoPs were previously perceived to benefit the individual members only, now the perception is changing, especially because of their potential to “overcome the inherent problems of a slow-moving traditional hierarchy in a fast-moving virtual economy” (Lesser& Storck, 2001: 832). CoPs can be key drivers of organizational success when managed correctly, due to their voluntary nature, which results in the generation of enough excitement, relevance and value, attracting and keeping the community members engaged (Wenger et al, 2002).

CoP enables the personal development and professional ability of staff to be connected to the organization’s strategy, resulting in them being more suitable for knowledge management than other organizational structures. As more organizations recognize the value of CoP as a way of knowledge transfer, investments and reporting of CoP activities have been advancing at many global organizations, including Hewlett-Packard Company, Xerox Corporation, World Banks and IBM Global Services (Gongla & Rizzuto, 2001:842). According to Wenger et al (2002), organizations which offer opportunities to participate in leading CoP in the professional knowledge domains of their workers now appear particularly attractive. CoPs are also now being routinely included on the agendas of knowledge management conferences as organizations are trying to find new ways of tapping on the knowledge and expertise that is spread across their global operations. At IBM, in 2001, there were over 60 CoP with members from every country, and these CoP hold their own conferences, both in person and online (Gongla & Rizzuto, 2001).

CoP members develop interdependencies as the community evolves, and the need for trust in CoPs is emphasized by Wenger and Snyder (2003:43), “the key challenge of a large-scale learning system is not whether members can learn from each other without direct contact but whether they can trust a broad community of communities to server their local goals as well as a global purpose”. CoP will not form automatically because there is a group of individuals doing the same job in the organization; socialization needs to take place first to allow the individuals to network, share experiences and exchange tacit knowledge.

The key to CoP success is the strong interactions which bind community members in some form of common space, usually defined by the organizational context in which they operate.

CoP drive knowledge creation in organizations, producing innovations and giving technical advice on problems. The creation process in a CoP continues and expands as the community matures; however as the knowledge management continues to evolve, it's also important for anomalies to be detected and interventions to be applied. The interplay between tacit and explicit knowledge leads to processes of knowledge conversion, expansion and innovation. The extent to which the social policies incorporated by the information system support the purpose of the community and are acceptable to its members, is often used as a key success factor for CoP.

Knowledge about the CoP and its domain needs to be developed and shared widely; when members don't feel personally connected to the group's area of expertise and interest once the CoP is established, it's most likely that they will not commit fully to the work of the CoP. There is therefore a need for the organization to also plan for how the community would share tacit knowledge, as well as use the existing technologies to manage explicit knowledge. Common education and development processes, communication processes, and organization assimilation processes play an important role in connecting people, whilst technologies which facilitate communication and those which identify individuals according to their knowledge domains and expertise are also important for CoPs. Processes which help the CoP to acquire, maintain and further knowledge, transfer knowledge beyond the CoP boundaries, as well as gather feedback about the CoP are also important for CoP growth and improvement (Gongla & Rizzuto, 2001).

For center-periphery organizations, because the CoP would have multiple nationalities using multiple languages, it's also important for the KMS supporting CoP to have translation capabilities in order to support CoP member communication needs. The organizational structure of most center-periphery organizations also often creates barriers to knowledge flows for those staff in different parts of the world.

Whilst CoPs are naturally occurring, they still need to be cultivated if they are to be effective for knowledge management. According to a research done by Snyder and Wenger (2003), the most important factor that determines whether a CoP will thrive is whether or not there is the leadership structure to guide, support and renew the community initiative over time. An executive sponsor would provide CoP legitimacy, while community coordinators would connect members and orchestrate activities. In a center periphery organization it would make

sense to launch CoPs in areas where the organization is reinventing the wheel often instead of combining the knowledge that is available in its global locations to develop new solutions.

It's therefore key for a CoP to have a sponsor who is in the organization's top leadership to regularly assess the CoP activities and ensure they are still aligned to the organization's strategic objectives. With such a setup, there is more likelihood of a best practice from one CoP to be adapted and adopted by other CoP in the organization as sponsors discuss their success stories at management level, enabling the whole organization to be more efficient. Also, where CoP activities overlap, sponsors may recommend merging of CoP, providing new ideas for strategic directions and opportunities to develop and share better knowledge within the CoP (Probst and Borzillo, 2008).

It's also the role of top leadership to create an environment where knowledge can still be shared across CoP for the success of the organization even when there is competition for funding. The sponsor then has the critical role of ensuring that management continues to support the COP financially, highlighting the COP's success stories in the organization and providing evidence of the COP's positive impact on the organization. Even in a competitive environment, this generally persuades management to continue investing in the COP. Lack of budgetary support for COP meetings, conferences and IT platform development also has a negative impact on CoP, when members are not motivated to maintain collaboration in the COP, the COP eventually ceases to exist (Probst and Borzillo, 2008).

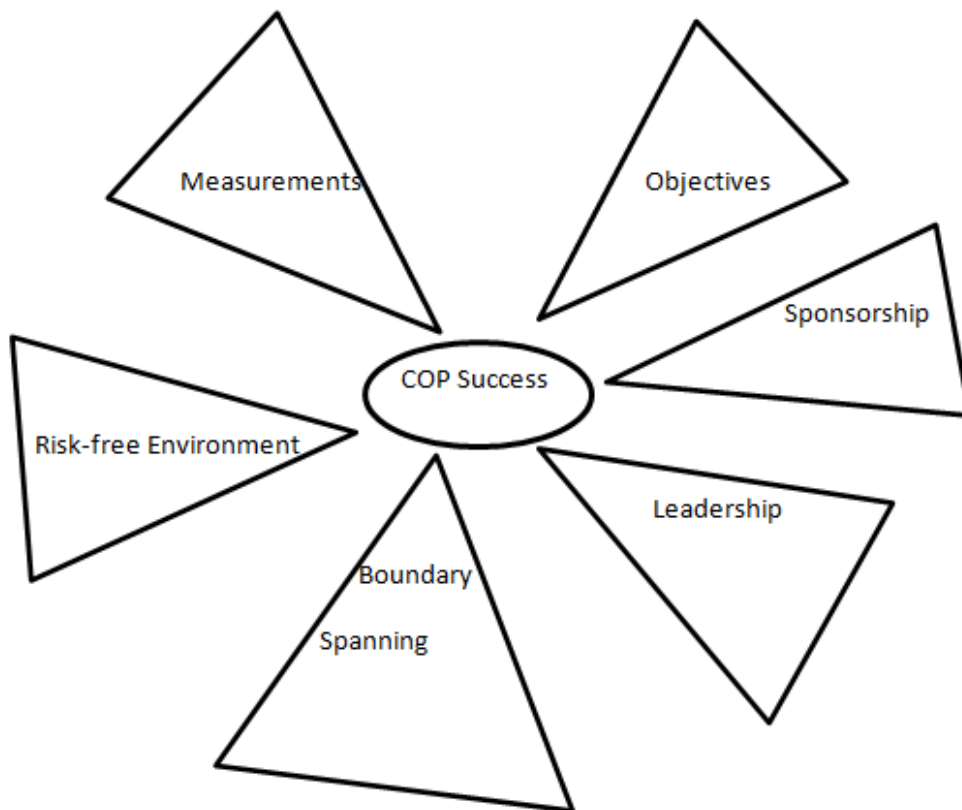
A CoP also needs a core group to be formed during its early stages, which will become responsible for driving the discussions in the CoP, and together with the sponsor, for ensuring that the discussions are aligned to the organization's objectives. It's important for the sponsor to regularly challenge this core group by reviewing best developed and shared practices in the COP. As the COP members try to increase knowledge exchanges within their COP, there is likely to be increase in the density of the knowledge flows within the COP. The sponsor of the COP would ideally need to be an expert in that area for them to be able to assess correctly if the best practices presented by the COP meet the strategic objectives of the organization, before presenting these to the organization's top management for consideration of organization-wide adoption. It's also important for the COP members to be made aware of these processes; members are likely to contribute more knowledge when they know that it will be used by others.

Publicity is also critical for COP success in an organization; members are more likely to visit the COP regularly to search for more knowledge posted by others if the COP advantages are publicized organization wide. Potential members are also valuable for COP success; some of them might be holders of knowledge which is critical for both organizational and COP success. For global organizations, country coordinators for an intra-organization COP can help with the process of bring new members to the COP.

A COP is generally regarded as a “hierarchy-free, learning zone” and according to research, there is flourishing of group discussions related to solving practice related questions in such a setup. This is due to the fact that there is usually no fear of job losses by the COP members, even if they criticize current practices and propose other knowledge management solutions for the organizations to consider in order improving performance. Whilst the members are able to do this in a COP, it’s important for them to remain focused on the organization’s objectives in their discussions, so that the COP continues to be relevant to the organization’s knowledge management strategy.

The organizations which lead collaborative webs extending beyond their boundaries are the ones which will succeed. The collaboration efforts by different stakeholders bring concepts together and make everyone more creative; as ideas are taken up, reinterpreted and applied by others, the result is the creation of knowledge which no individual or organization could have done alone (Keith Sawyer, 2007). The figure below summarizes the COP success factors discussed above.

Figure 5: COP success factors. Source: Probst, G. and Borzillo, S (2008)



3.5 Conclusion

There are two main views of knowledge management systems according to Newell et al (2009), the practice and possession views. The practice view highlights the limitations of the structural approaches and how relationships which are developed in CoPs can provide solutions to these knowledge management system limitations. Organizations however need to leverage on the CoP benefits as well as provide the right environment for the CoPs to be able to support knowledge management efforts. The possession view was described using Becerra-Fernandez's Knowledge Management Solutions framework; explaining the relationship between the knowledge management systems and the knowledge processes, as well as the mechanisms, technologies and infrastructure which support the different types of knowledge management systems.

CHAPTER 4: CASE STUDY (AIDORG)

4.1 Introduction

AIDORG's assistance to countries in the developing world continues to increase, along with the number of people the organization is employing. As an international organization with operations in multiple countries, AIDORG provides an important platform for learning, knowledge transfer and knowledge sharing, all of which have strategic importance to the long-term existence and growth of the organization. According to the AIDORG Open Government Plan, "Part of AIDORG's knowledge management mandate is to support and leverage better knowledge exchange, application and use; enabling staff and partners to work better, faster and smarter" (www.aidorg.org/open, 2010:23).

It's therefore important for AIDORG to have a framework which supports as well as continually improves its knowledge processes, including addressing critical factors such as the organizational structure, culture, language, and technological boundaries, which affect knowledge management systems in international organizations. The platforms, tools and processes for AIDORG collaboration range from those that support internal agency business and operations, to others that enable better dialogue and cooperation in programmatic activities, to ones that extend into the inter-agency or inter-governmental arenas.

Vertical knowledge transfer is the most common at multinational organizations, and AIDORG is not an exception. Even though field offices have knowledge that is useful for the center as well as other field offices, knowledge transfer is mainly happening from the center to the periphery, based on the assumption that the center has more valuable knowledge compared to the periphery. The periphery is mainly expected to adapt the knowledge coming from the center, however this complicates the knowledge flow in the organization, as strategies for periphery operations are being mainly commissioned at the center, and the periphery is only expected to implement.

According to Becerra & Sabherwal (2010:42), "Knowledge management infrastructure includes organization culture, organization structure, IT infrastructure, common knowledge, and physical environment". This chapter will map the KMS design at AIDORG with the aid of Becerra-Fernandez's KM framework, and describe how AIDORG KMS are supposed to work, so as to ensure a holistic picture that goes beyond the IT architecture.

4.2 Knowledge Management Infrastructure at AIDORG

4.2.1 Organizational Culture

The organizational culture attributes which enable knowledge management in an organization, including “understanding the value of KM practices, management support of KM at all levels, incentives that reward knowledge sharing, and encouragement of interaction for the creation and sharing of knowledge” (Becerra & Sabherwal (2010:43).

At AIDORG, the understanding of the value and benefits of knowledge management practices has greatly improved over the years. In October 2014, AIDORG released its first ever open data policy, whose goal is to provide a systematic way of having a centrally repository for all Agency-funded data and also ensuring that the collected data is usable. Through the open data policy, AIDORG’ data can be shared with its diverse set of partners, who are then able to gain new insights from this data and apply the generated knowledge in their work to improve development efforts.

The announcement of this policy in 2014 highlights an increased understanding of KM practices’ value and benefits for AIDORG as an organization. The Development Data Library, which was developed as a result of this policy, provides a source of very rich data, generated over a long period of time, which both AIDORG and partners can use to generate new knowledge and develop innovative solutions to address today’s development challenges. To emphasize the importance of knowledge sharing for the organization’s development efforts, the open data policy does not give knowledge sharing options to staff, the policy “requires AIDORG staff and implementing partners to submit datasets generated with AIDORG funding to the development data library” (<https://blog.██████████/2014/10/announcing-██████████data-policy/>). AIDORG has staff and implementing partners who are scattered all over the world, and operating in different types of environments, and it’s critical that knowledge is immediately accessible to everyone who needs it for their work.

With the rising need to foster a learning culture in order to meet new development challenges, management support for KM at all levels of the organization has also been improving, including increasing allocation of funding resources for the organization’s knowledge management efforts. In 2014, AIDORG LEARN, “a contract funded by the Bureau for Policy, Planning and Learning that supports strategic learning and knowledge management at

AIDORG to improve the effectiveness of programs in achieving sustainable development outcomes. It supports capacity building within AIDORG and its partners to become more knowledge-driven and responsive to evolving development challenges” was introduced ([https://\[REDACTED\].org/learn-contract](https://[REDACTED].org/learn-contract)). The contract is worth \$57 million, and works with both Washington and mission staff to institutionalize learning as well as provide training in collaboration, helping them to build their learning capacity, through facilitation of self-assessment processes, as well as promoting tacit knowledge capture tools. However, according to the LEARN page, one of their objectives is “developing, managing, and curating knowledge sharing platforms, resources and processes”, highlighting the fact that most knowledge processes are still centralized.

Whilst there have been a lot of initiatives which encourage interaction for the creation and sharing of knowledge at AIDORG, there are not many examples of incentives that reward staff for knowledge sharing. According to Becerra-Fernandez’s example, bonuses to individuals managing departments active in knowledge sharing were based on “whether the department made knowledge contributions and whether the department extracted and used knowledge from another department” (Becerra & Sabherwal, 2010:44). This culture of monetary rewards does not exist yet at AIDORG, most staff who excel in knowledge sharing efforts are however acknowledged through the Agency wide intranet system or other widely distributed newsletters. The knowledge sharing culture is better at head office level, mainly because most of the organization’s knowledge sharing initiatives start from the center and then trickles down to the periphery.

However, the launch of the U.S Global Development Lab in 2014 has seen a positive shift towards rewarding knowledge management efforts by AIDORG. The Grand Challenges for Development program “offers innovators opportunities and prizes to apply their scientific and technological know-how to develop solutions” in the fields of health, food security, education, agriculture, and governance ([www.\[REDACTED\]/grandchallenges](http://www.[REDACTED]/grandchallenges)). The Development Innovation Ventures is also another AIDORG funded open competition supporting knowledge generation by “supporting breakthrough solutions to the world’s most intractable development challenges-interventions that could change millions of lives at a fraction of the usual cost” ([www.\[REDACTED\]/div](http://www.[REDACTED]/div)).

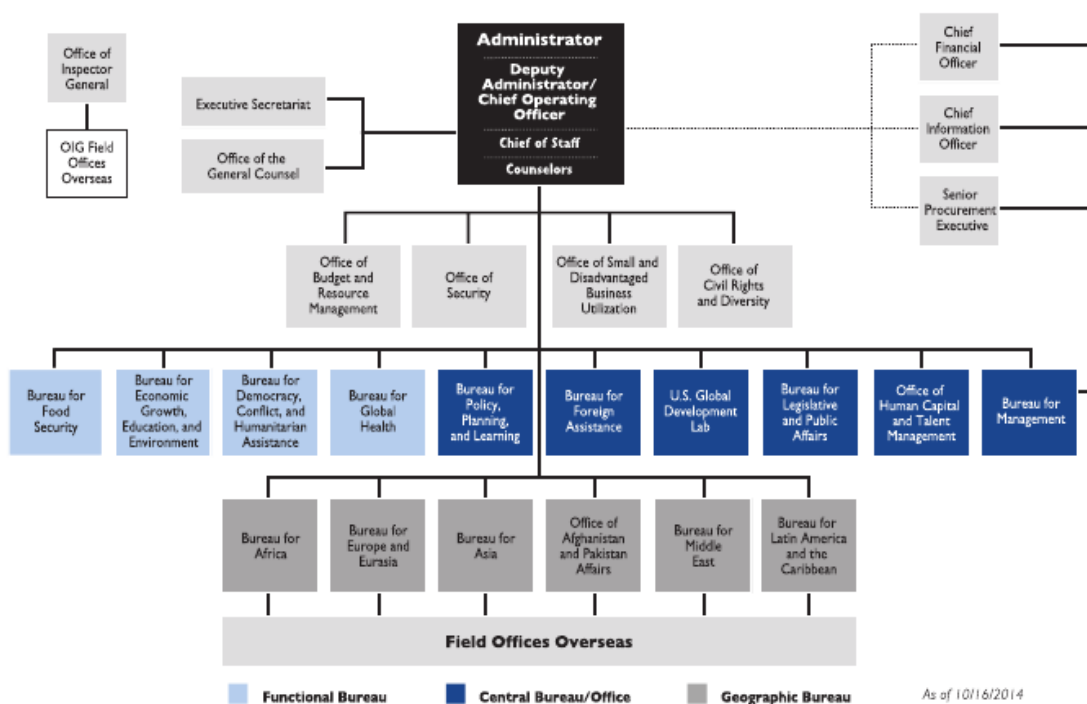
The encouragement of interaction for the creation and sharing of knowledge is widely popular in the organization, both within and outside the organization. The Agency intranet and e-mail

systems provide a readily accessible platform for real time collaboration for staff. Partners also have multiple platforms that they can use to share and capture knowledge, including websites that are sponsored by AIDORG, as well as a variety of decision support systems, groupware and repositories of best practices.

4.2.2 Organization Structure

According to Becerra-Fernandez et al (2010:45) “knowledge management depends to a large extent on the organization structure”. AIDORG is a decentralized organization, with much of its programmatic power and decision making decentralized to the in-country Missions (www.██████████/open, 2010:23). The field offices however also have hierarchical organization structures, which also determine the likely knowledge flows.

Figure 6: AIDORG organizational structure



According to Becerra-Fernandez (2010), this type of structure affects who each individual can interact with, as well as where they are likely to transfer or get knowledge. There is however an increased likelihood for knowledge to go beyond the group that each individual interacts with at the field offices compared to head office, because there are other channels to share knowledge and there is generally an increased size of groups reporting to each individual.

Knowledge management can also be facilitated through communities of practice in an organization (Becerra-Fernandez et al, 2010). These are very common at AIDORG, given the

geographical spread of AIDORG operations. Whilst face-to-face meetings between professionals doing the same work are not always possible, staff has taken advantage of Web 2.0 technologies to develop and maintain the communities of practice and use them to generate as well as share knowledge. According to Becerra-Fernandez (2010:45), in communities of practice “there are more numerous potential helpers and this increases the probability that at least one of them will provide useful knowledge”.

AIDORG is also supporting communities of practice that include external stakeholders, including partners, consultants, universities and other research staff; ensuring availability of a larger knowledge reservoir in the organization. In recent years, AIDORG has provided funding to support the launch of various initiatives that have made possible the emergence of COPs comprising AIDORG Washington, Mission staff and other external stakeholders. This support has led to the emergence of legitimate communities of practice, where participation of staff is fully supported by management, including provision of financial and technological resources for staff participation. The organization has benefited from the knowledge generated and shared in these COPs, as well as the skills and abilities gained by staff and applied in their day-to-day work. Some of the AIDORG supported initiatives which have promoted COPs include;

The AllNet portal, “a collaborative work environment for AIDORG staff, partners, contractors, alumni, and affiliates”,

The Knowledge-Driven International Development (KDID), “a family of websites established to maximize the effectiveness of development assistance by connecting development practitioners through learning opportunities and spreading innovation and good practice. They are vibrant communities where members discuss ideas, share experience, connect to other professionals, and access the latest thinking in best practice” (<http://kdid.org/about-kdid>).

The U.S Global Development Lab which “fosters catalytic networks and engage non-traditional stakeholders to identify, address, and propose solutions for development challenges and build evidence for better development” (<https://www.██████████/GlobalDevLab>).

Learning Lab an online collaborative learning community of development professionals, which “extends the dialogue between AIDORG Washington and Missions to engage partners and features key tools and learning approaches for AIDORG staff and partners to share

experiences and support each other's efforts to develop a more dynamic approach to programs" ([https://\[REDACTED\]lab.org](https://[REDACTED]lab.org)).

According to Becerra-Fernandez et al (2010:45), "organization structures can facilitate knowledge management through specialized structures and roles that specifically support knowledge management". The past few years have seen changes and reforms to support these specialized structures and roles, including the appointment of a Chief for the AIDORG Knowledge Management Branch, who leads the organization's knowledge management efforts. AIDORG has also established a department specifically for knowledge management, the Knowledge Management branch. The responsibilities of this branch at AIDORG include "connecting people to timely, relevant and accurate information capture the knowledge generated by AIDORG programs and staff, applying the captured knowledge to replicate success, and providing an environment in the organization where information sharing, learning and collaboration are encouraged" ([https://www.\[REDACTED\]/results-and-data/information-resources/knowledge-management-support](https://www.[REDACTED]/results-and-data/information-resources/knowledge-management-support)). The branch has also established a knowledge management reference group, comprised of AIDORG Bureaus and other external stakeholders, to obtain Agency-wide input on the agency's knowledge management program.

According to Becerra-Fernandez, a corporate library's role is to "facilitate knowledge sharing activities as well as serve as a repository of historical information about the organization" (Becerra-Fernandez et al, 2010:46). However at AIDORG, the library is mainly there to "keep Agency staff and the public informed on a broad range of development topics by collecting commercially public books and videos" ([https://www.\[REDACTED\]/results-and-data/information-resources/about-library](https://www.[REDACTED]/results-and-data/information-resources/about-library)). The knowledge sharing and repository role is fulfilled by the Development Experience Clearinghouse (DEC), "the largest online resource for AIDORG-funded technical and project materials" (dec.[REDACTED]), which allows users to search for resources, submit AIDORG funded project documents, and share their DEC experiences with other users. Within the knowledge services center, there is also a Research Services department, which supports latest and future knowledge management developments.

4.2.3 Information Technology Infrastructure

The organizational "data processing, storage, and communication technologies and systems" facilitate knowledge management (Becerra & Sabherwal, 2010:46). AIDORG staff is all over the world, and it's critical for staff to be able to access timely and accurate information

regardless of location. Both hardware and software advances have enabled AIDORG's knowledge to be able to reach and connect staff and partners in various locations.

In recent years, AIDORG has been shifting from static systems to dynamic ones, providing the infrastructure to collaborate and share knowledge in real time. With the emergence of cloud-based technologies, AIDORG has embraced technologies such as Google Chat and Google Drive, technologies that make it easier for staff to communicate and store large amounts of data. Whilst these technologies require an investment in the Internet to ensure positive results, they have enabled expanded reach, making it possible for staff to access organizational knowledge anytime and anywhere. There are still some users however, who still do not trust the cloud, and are therefore not collaborating through these platforms, providing another challenge for the organization. AIDORG is also continuously reviewing and updating its IT standards, ensuring that the software and hardware in use at both head office and field offices is able to support the modern technologies that the organization is adopting.

Whilst bandwidth costs continue to be high in some of the countries where AIDORG is operating, most field offices have invested more in this to ensure that the expected depth is reached. Due to the geographical spread of the organization, communication technologies such as video conferencing are used regularly for effective communication between Missions and head office. The availability of video and options to share and discuss presentations, which are not available on an ordinary conference call, ensure that detailed information can get to the participants. Improvements in bandwidth have also led to increased use of desk video conferencing, with staff at different locations being able to share knowledge from their desks in real time, even though at Mission level it continues to be a challenge due to bandwidth limitations. These technologies do provide richness to AIDORG's communication mediums, allowing "multiple cues simultaneously and providing quick feedback" (Becerra & Sabherwal, 2010:47).

Other Web 2.0 technologies such as YouTube are also used for staff to be able to view recorded sessions of official events, but generally streaming is not approved for non-official purposes, which could hinder knowledge application as staff is not able to do self-learning whilst at work. Other popular technologies that provide richness, such as Skype and WebEx, are also not approved, limiting to a large extent the rich technologies that are available for staff to communicate and share knowledge with stakeholders who are outside AIDORG.

Over the past few years, the organization has been aggregating large volumes of information that was previously in many different systems, into one intranet site, which provides a centralized repository of the organizational information and knowledge. The new intranet is also a dynamic site, which allows for instant feedback and is able to reach everyone in the organization, including colleagues who have the same interests, as well as subject matter experts for various areas. The Development Experience Clearinghouse is also another platform that allows aggregation to take place, through organizational policies that require submission of all AIDORG funded project documentation. Users are then able to search for and apply the knowledge they gain from the DEC in other projects, as well as share their experiences, reaching everyone who has access to the platform.

4.2.4 Common knowledge

AIDORG uses a common language and vocabulary in its internal operations; organizational policies are available to all staff through the ADS (Automated Directives System), which is available on the web as well as a mobile app for all staff that have access to an official mobile device such as iPad and iPhone. Whilst the policies are drafted at the head office, both the head office and the periphery are expected to fully comply with the organizational policies that are relevant to their area of work.

For internal documents, the organization has also developed acronyms, which anyone outside the AIDORG system will not be able to interpret, whilst anyone inside AIDORG will be able to interpret or search for full meaning easily. These are also mainly developed at the center and then shared with the field offices. Whilst the common language and vocabulary makes communication inside AIDORG easier, it does not necessarily improve communication between AIDORG and external organizations. AIDORG might not necessarily have shared norms that are organization wide, but field offices usually have internally published shared values that each member of staff is expected to understand and respect. This provides unity within each field office, but does not necessarily provide unity between field offices and head office, or between two different field offices.

Generally there are elements of specialized knowledge that are common across individuals sharing knowledge within the organization. Individuals who are doing the same job at different field offices will have the same title and position description. There might be slight variations due to differences in operating environments, but generally the specialized knowledge required is the same, and staff can easily share knowledge with colleagues who are

doing the same work or provide coverage at different field offices when required. The process is the same for individuals who share knowledge between head office and field offices; whilst the specialized knowledge of head office staff is usually a level higher, individuals working in the same department can easily understand each other and share knowledge.

There is also “recognition of individual knowledge domains” within the organization that cascade from the head office to the field offices. Departments such as Finance, Information Technology, Health, Food Security, and Procurement exist in the organization both at head office and field office level. Each domain has its own team leader, usually an expert in that knowledge domain, and there are no instances where you will find two different domains under one leader. Experts in other domains are expected to reach out to experts in the other domains if they are looking for knowledge that is outside their own domain. The existence of similar domains at field office level is usually determined by the context of the operating environment, so not all departments that exist at head office level will exist at each field office, but where they exist, the operating standards for each domain are set at head office level.

Knowledge management systems such as the intranet, whilst providing common knowledge and supporting knowledge transfer because there is a lot of knowledge which is accessible from different places, also increase value within the organization. Whilst such systems provide a platform where employees can share and capture knowledge, external organizations have no access to the knowledge and only the internal organization will realize value from the shared knowledge.

4.2.5 Physical environment

Becerra-Fernandez highlights the importance of the physical environment for knowledge flow in an organization, through “provision of opportunities for employees to meet and share ideas” (Becerra & Sabherwal, 2010:48). At both head office and field office level, generally each department is in the same building and when possible, the same floor. Most facilities are shared, and even though there are no designated times for breaks, staff usually meet around these spaces and can share knowledge over general conversation.

The design of the offices usually depends on a number of factors, including whether it is an owned or rented building, and whether it is an old or new building? At head office level, the common setup is to have an open plan office setup in order to increase the probability of interaction and knowledge sharing between staff. At field offices however, it mostly depends

on the two factors above; if building was built recently, office setup is mainly open plan, but if building is older, each staff usually has their own office. The organization is slowly transitioning to a physical environment that supports knowledge sharing by changing to open plan office setup.

To support knowledge transfer and sharing between departments, the organization usually have places that make it easier for different departments that usually work together to meet. The setup of offices at both head office and field office level is also such that departments that are likely to work together will be in the same building where possible. Whilst the number of conference rooms will be limited at both head office and field office levels, the field offices are more likely to be able to provide other meetings spaces outside their buildings if their location allows it. General meeting rooms usually have all the facilities which support knowledge generation, capture and sharing, including video teleconferencing equipment, internet, and computer which supports latest knowledge management technologies.

Whilst the physical environment generally support the knowledge management processes at AIDORG, knowledge flow between the center and the periphery still remains a challenge due to the geographical distance. The knowledge that is generated at both the center and the field due to the enabling physical environment still needs to be shared organization-wide for the organization to realize value. If the knowledge sticks in one location, it defeats all the efforts the organization has made to create an enabling physical environment.

4.3 Knowledge Management Mechanisms

Employee rotation: AIDORG direct hire staff is normally assigned to one periphery site for four or more years, and the assumption is that these long term assignments increase the chances of them sharing as much knowledge as possible with the local staff. Trust relationships develop over time, and according to Dobrai et al. (2012), they influence the degree of knowledge transfer, the expectation is that there will be increased bi-directional knowledge flow as the relationship between direct hire and local staff gets stronger.

The organization has realized the importance of these relationships and has also shown interest for experiences gained at the periphery as well as the knowledge from there, introducing programs where locally employed staff can go and work at the center or at other periphery sites for limited periods of time. The expectation of these programs is that the same knowledge processes that take place when direct hire staff are at the periphery, will also take

place when the local staff are at the center or at a different periphery sites. Whilst the programs have been very popular and have provided opportunities for staff to learn as a result of work-related mobility, there might be need to do more to improve knowledge flows during these processes. The time available for the exchanges for locally employed staff is mostly limited to about three months or less, and because some of this time is invested in developing trust relationships and understanding the culture, not enough time is left for the knowledge sharing or discovery to happen.

The knowledge processes could benefit from programs that make it easier for the local staff to adapt to the new environments, such that more time is invested in knowledge management processes. Also, some of the local employed staff do not get opportunities to participate in these programs, mostly because of coverage challenges at their home sites, as well as the competitiveness of the programs. This means there are some staff who do not get the opportunity to socialize with colleagues at the center or other periphery sites, and their tacit knowledge remains theirs until they leave the organization, even though it could have been used to improve organizational processes.

According to a research done by Dobrai et al (2012), knowledge transfer ability and motivation are the two most important factors and enablers of knowledge processes. Whilst the structure of the organization and its strategies influence knowledge transfer, it's also important for the direct-hire staff to be motivated individuals as this plays a role in the organization's knowledge management goals. When they are based at the periphery, the expectation is that they have the skills required to effectively share knowledge that does not exist at the periphery with the local staff through externalization, providing on the job training to local staff and helping them to understand center operations.

And whilst these skills are important, they also need to be able to transfer their knowledge in ways that the local staff can understand. The research by Dobrai et al (2012) also highlights the importance of being trained and developed in a local environment during the knowledge acquisition process. The internalization of knowledge is also expected to happen during this process as the direct hire staff interacts with local staff. Assuming that a trust relationship has developed and there is willingness and motivation to share knowledge, socialization takes place and the local staff also share their knowledge. The expectation is that the direct hire staff will take back with them to the center for organization-wide sharing, as well as grow from their experience in the field.

Initiation process for new employees: at field office level, for both direct hire and local employed staff, the first week is mainly orientation week. Most of the organizational knowledge is already captured in documents and new staff is expected to read and internalize the knowledge. In addition to the printed and online reading material, face-to-face meetings are also scheduled with the team leaders of each department, allowing the new staff to share knowledge about their previous organization and discover some new knowledge about the organization through the socialization process as well. The knowledge shared in these face-to-face meetings is however not being effectively captured for externalization, rather it's mostly the participants of the meetings who get to internalize the knowledge shared.

Whilst there is no knowledge management department at Mission level to spearhead this effort, making collaboration and learning a part of the orientation process could help to ensure new staff get an understanding of the importance of knowledge management right from the beginning. For direct hire staff, the initiation process may also involve a temporary duty assignment at a regional field office, where operations are usually bigger and faster paced, allowing them to gain a more in-depth knowledge and understanding of organizational operations. The regional field offices also have direct hire staff from head office providing coverage or training most of the time, enhancing opportunities to discover and share knowledge while socializing with this group of people.

Cooperative projects across departments: at periphery level, there has been a lot of collaborative work between departments. Where areas of operation overlap, teams have continued to share knowledge about their activities and helped to improve the quality of work for other departments. Project report reviews, which are done at the conclusion of each project, have resulted in the generation of new knowledge, which is discussed widely within the mission, giving staff from other departments opportunities to contribute as well as learn. Technologies such as Google Drive and Huddle have improved the organization's collaborative creation of documents as well as problem solving; however, the technologies have limitations for inter-organizational collaborations, which could result in better combination of knowledge to generate new knowledge for the organization.

Whilst these have been effective mechanisms for knowledge management, identification of collaboration and learning goals at the beginning of the project could improve knowledge flow during the project, ensuring knowledge capture and sharing throughout the project life cycle. The knowledge generated from these reviews is summarized into a report, which is

then shared with head office, and if the knowledge is deemed useful for other Missions who are doing the same work, the report is also shared with them. Field offices are generally not expected to share these reports between themselves without getting clearance from head office first.

In the past few years, the organization has made significant progress in recognizing and encouraging use of knowledge management systems to improve operations. A knowledge management branch has been established to lead the organization's knowledge management efforts and this has resulted in improvements in knowledge management both at head office and field office level. The field offices however continue to rely on the head office for knowledge management guidance, as the knowledge management branches have not been set up yet at field office level, which to some extent has slowed down the organization's knowledge management efforts. Other learning and collaborative platforms such as forums and communities of practice could help to improve the organization's knowledge management efforts.

Learning by doing/observation: AIDORG staff are generally expected to learn by doing and/or observation, especially staff who will be new to the organization. For the new staff, the first week, in addition to the orientation process, is when they are expected to observe how their colleagues in the team do their work, as well as practice how to do the same work on their own. Office directors at AIDORG Missions are mainly direct hire staff, who are mostly experts in their fields, and during the time they will be working in the field, local staff are expected to observe how they do their work and use that knowledge to improve their own work.

The traditional hierarchical relationships also allow team leaders to provide direction to their staff on how to do their day-to-day work or when they are assigned other challenging tasks, allowing staff to apply the knowledge to complete tasks which they would not normally be able to complete without the team leader's guidance. Field trips to the sites where AIDORG work is being carried out are a widely used practice for staff who are in the technical offices to gain new knowledge. Staff goes out to the field, usually with the partners who are implementing the project, to look and learn whilst the work is being done, using the knowledge gained during this observation to improve the operations at these sites, as well as update mission management and head office. Staff makes use of checklists that are standard throughout the organization, to document their findings during these site visits, as well as list

follow up actions, both of which are shared with the implementing partners. As the organization steps up its knowledge management efforts, site visits have also been used to identify collaboration and learning opportunities and challenges that exist on site.

Programs such as fellowships and senior advisory corps, have been a huge success in the organization, mainly because of the knowledge sharing and exchange that takes place between field office and head office staff during these programs. The number of calls for staff to participate has increased over the years, both from field offices and head offices, benefiting both the participating staff and the hosting offices. During these rotations, staff has opportunities to socialize with new staff and share their knowledge as well as learn from the hosting office staff, and they also have opportunities to gain hands-on experience by doing things, which they would not necessarily do at their home offices. At the end of their rotation, the staff is also expected to share the gained knowledge with their home office, as well as apply it in their work to improve operations.

Organizational policies and standards: In recent years, the organization has adopted a number of policies in support of knowledge management. The Open Data Policy of 2014 has ensured improved knowledge management by providing direction for staff to follow when putting in place systems that capture knowledge about AIDORG's work, as well as making it available to the public. Other organizational policies are also enforcing knowledge management systems in the day-to-day work of staff, having a centralized and collaborative intranet as the only place where staff can find certain organizational knowledge have resulted in improved knowledge sharing and capture. Both field offices and head office are mostly using the same system to access and share organizational knowledge, which has resulted in a more integrated knowledge management system for the organization. The collaborative nature of the site also means that staff who are new in the organization can easily access knowledge which was shared in the past, and staff who are interested in certain knowledge areas can use the site to access discussions and solutions which were done through the site. The DEC policy has also helped the organization to manage knowledge better, with knowledge gained from all AIDORG projects around the world being stored in a central database for wider sharing.

Face to face meetings: Due to the geographical spread of the organization, face-to-face meetings continue to be limited between head office and field office. Face-to-face meetings however continue to be a common knowledge-sharing platform for offices that are in the same location. Even with technological advancement such as desktop video conferencing,

staff that is in the same location have continued face-to-face meetings and used these to share knowledge and learn from each other. The frequency of face-to-face meetings between head office and field offices has however significantly gone down, mainly due to the costs involved in this process. Memos and progress reports, which are sent via e-mail, are mostly used to communicate field office findings, developments, or requests to the head office.

Whilst conferences were previously used as a platform to network, share knowledge and learn from colleagues who are doing the same work at other field offices, video conferencing and teleconferencing, which are mostly organized from head office, are now the most widely used platform to share knowledge. And whilst this has been effective for knowledge sharing to some extent, this has significantly reduced the number of platforms staff has to network with colleagues. They have to mostly depend on head office when looking for knowledge that they do not have, and this has affected the socialization process of knowledge management.

At the field offices, partner meetings have continued to be an effective way of knowledge generation and sharing, both between AIDORG implementing partners and between AIDORG and the partners. The meetings are generally used as a platform to share best practices, as well as update partners about AIDORG policy changes, including in knowledge management, and this is mostly done through discussion sessions, which encourage networking and sharing of collaboration and learning experiences. Recently, field offices have also introduced the idea of knowledge summits; topical thematic areas that involve thought leaders, stakeholders and implementing partners, which are meant specifically for knowledge generation through collaboration and learning from each other. Even though this is an annual event, it has been highly successful platform to discuss knowledge management systems trends, challenges and opportunities, resulting in evidence based programming of AIDORG operations.

Brainstorming retreats are widely used at departmental level at the field office to share knowledge within teams. Whilst there are usually agendas of items to be discussed when retreats are held, teams generally leave time to share knowledge about issues which affect their work as well as learn from each other. The challenge with the departmental level retreats has been that the knowledge generated from these does not get to be formally shared organization-wide, even though other departments could benefit from it. Organizational wide retreats at field office provide a platform for all staff to collaborate and learn from each other, through presentations or question and answer sessions, however, time limitations have seen the frequency of retreats significantly going down. There is therefore a need to set aside a

space within the organization where collaborating and knowledge sharing can still continue outside the formal work in the office.

Manuals: The geographic spread of the organization means there is need for everyone to have access to organizational knowledge if the organization is to be effective. The organization makes use of widely accessible manuals to set out operating standards and policies for each of the organization's operating areas. The government wide Foreign Affairs Manual (FAM) and the AIDORG specific Automated Directive System (ADS) are examples of manuals which give direction to staff on how to do their work. These manuals are mainly developed at head office level, and all staff are expected to refer to them and follow the direction when applying the knowledge to their work. The technological advancements have also helped the organization's management of the knowledge contained in these manuals; whilst these manuals were previously only accessible when users had access to the AIDORG network, now users with official mobile devices have these manuals pushed out to their devices as applications, making it possible for staff all over the world to access the organizational knowledge anytime and from anywhere.

Helpdesks: AIDORG makes use of helpdesks to support its staff. Whilst the field offices will have experts to provide support for corporate applications and systems, when the local experts are not available or are not familiar with the problem, staff do have the ability to call the helpdesk and get direction on how to resolve their challenges. Even though staff who are not familiar with the field are not able to internalize the knowledge they get from the helpdesk, the helpdesk systems provide a link to the experts at head office and reliable sources of knowledge for staff, allowing them to apply the available knowledge to quickly resolve their problems.

Best practices and lessons learned are widely used at AIDORG to share with other field offices as well as head offices what practices have improved operations as well as the lessons learned from the field. Whilst a number of knowledge management systems exist which allows staff to share these, such as ProgramNet (internal) and Learning Lab (includes partners), some field staff are not aware of the existence of these systems. Also, some field offices, whilst they may have best practices and lessons which everyone could benefit from, will not necessarily publish them on these sites unless if they are not asked to.

4.4 Knowledge Management Technologies

Electronic Discussion Groups – this technology is common at AIDORG due to the geographical spread of the organization, allowing staff to ask questions and discuss in real time. Whilst some of the electronic discussion groups are internal, other systems such as the LearningLab.org includes electronic discussion groups, allowing staff and partners to discuss and share knowledge on various topics. The Knowledge-Driven International Development (KDID) Portal also allows “members to discuss, share experience, connect to other professionals, and access the latest thinking in best practice”. The AIDORG AllNet Portal, whose diverse audience includes staff, government community, partners and others who are involved in international development, also includes discussion forums which allow members to “create collaborative content, collect feedback, and interact with portal members or groups”.

Databases: databases provide a way for staff to search and find organizational knowledge. The AIDORG AllNet Portal also includes a document library where members can upload files or download files that are available in the library. The Development Data Library, which was established in response to the AIDORG Open Data Policy, “is a repository of AIDORG-funded machine readable data created or collected by the Agency and it’s implementing partners”. This data is available to all users, some of who may be doing similar work and would benefit from new knowledge, which can be generated through combination of various data. These are mostly web-based systems, which were developed with the assumption that all users have access to a reliable internet connection that will allow them to easily access this data and benefit from it.

Expertise Locator Systems: AIDORG boasts experts in a lot of fields, given the various development programs that the organization is involved in all over the world. Whilst the organization previously relied on the knowledge of consultants to do their work, the knowledge gained by staff over the years has meant a decline in the use of consultants. To better manage the location of the experts by field offices or head office, the organization has included within the intranet system a feature which makes it easy to search and find experts in any field, including both locally employed staff and direct hire staff. The success of this system however largely depends on experts taking time to complete robust profiles about their field of expertise on the intranet system, without which searchers will not be able to find them. However, whilst it’s recommended that all staff complete their profiles in the intranet

system, it's not mandatory and some staff have not done it, making it impossible for other staff to access the already existing tacit knowledge, even though the technologies are there.

Videoconferencing: this knowledge management technology is widely used in the organization, both between field missions and between field missions and head office. A number of trainings have been successfully conducted using videoconferencing and this has significantly reduced costs whilst allowing knowledge flows, but for field offices, the challenge of bandwidth limitations means the quality is not always good. Also, whilst the participants can see each other during the session, if they have not met before, socialization is most likely to be at a very low level because there will be no trust between them. Knowledge flow is therefore restricted through video conferencing compared to face-to-face meetings. Also, some of the knowledge that is shared during videoconferencing may be lost, because it's difficult to capture all the knowledge and participate in the discussion, which most of the time is time sensitive. It's therefore likely that those who do not actually participate in the videoconference session will not get the knowledge that is generated during the session.

Web 2.0 technologies: the use of a web-based e-mail system has contributed immensely to the knowledge management efforts of the organization. Whilst the security and privacy risks are there, the advantages outweigh these risks. With a web-based e-mail system, users do not necessarily have to be in the office to easily access the knowledge that is in their e-mails and share it from wherever they are. Additional features such as chat and cloud storage have also made it much easier to share and manage knowledge both at the field and head office. Whilst the availability of chat means that even staff who are at the same location are no longer socializing as much as they used to and the probability of accidental knowledge sharing has been reduced, it has improved the efficiency of the organization due to the easy access to knowledge, which can be retrieved for later use. The high costs of maintaining information technology hardware means space restrictions for users, so they could not store all the knowledge they needed. The introduction of a cloud based storage means users can now store a lot more knowledge, share it with colleagues, and easily search and find it when they need it. In an organization with a lot of staff movement, these technologies have also reduced the risks of data loss and the need for staff to keep copies of their files on personal devices during movements, as the knowledge is now easily accessible on the web.

Computer-based training technologies: Whilst it is not feasible for everyone to be classroom-trained, all staff have access to the learning management system. Trainings that are mandatory

for all staff are mainly conducted online, and generally staff is able to internalize and apply what they learn. This however reduces the ability for staff to discover or share knowledge, as it does not provide a platform for trainees to ask questions or engage in a discussion, which they can do in classroom training. There is also an issue of technological challenges for the field offices, especially the internet bandwidth, which is a must-have for staff to be able to learn from through online courses. Therefore whilst knowledge may be available in the organization, it might not be fully used due to these challenges.

4.5 Knowledge Management Systems and Processes

4.5.1 Knowledge Discovery and Knowledge Discovery Systems

Through the sub processes of combination and socialization, knowledge discovery systems “support the process of developing new tacit or explicit knowledge from data and information or from the synthesis of prior knowledge” (Becerra & Sabherwal, 2010:62). The main objective of knowledge discovery at AIDORG is to “generate development knowledge that optimizes the use of innovative approaches”, through improved situational understanding, application of consistent development methodology and use of appropriate ICT tools (<https://www.██████████/results-and-data/information-resources/knowledge-management-support>).

According to Nahapiet and Ghoshal (1998), new explicit knowledge is created through these multiple streams of explicit knowledge. AIDORG is partnering with other donor organizations and implementing partners to create global development commons, supporting the discovery of knowledge in a multi-faceted development assistance environment that involves many development partners. In addition to improved development practices for AIDORG, this has also enabled better and smarter accomplishment of the organization’s development objectives. The partnerships have created sources of new ideas, solutions and approaches, as well as started critical conversations about the challenges the development world is facing.

The Learning Lab and the Knowledge for International Development initiatives are examples of the partnerships AIDORG has with other organizations that have resulted in knowledge discovery. Through these systems, knowledge from different organizations is combined to generate new knowledge through collaboration on issues affecting the development world. At the Global Development laboratory at head office, development practitioners and experts

from different organizations and universities work in one place, providing opportunities to discover new knowledge through the process of socialization. The program is also evolving to take advantage of the knowledge that locally employed staff have, giving them opportunities to contribute to the development of the innovative solutions before the implementation process starts in the field, through fellowships at the laboratory.

The organization's knowledge services center, which is made up of the library, research services and development experience clearinghouse, is also a part of AIDORG's knowledge generation systems. The library and development experience clearinghouse are both supporting the combination of knowledge by staff, through provision of easy access to the organization's existing knowledge. The systems provide desktop access to electronic journals and expert searches for journal articles and organizational documents. Whilst there is almost no socialization to support these knowledge generation systems, staff are able to search and find the knowledge they need from anywhere, and can combine this knowledge with what they know, resulting in the discovery of new knowledge for the organization. The Research Services branch provide quick updates and in-depth research and analysis of the organization's information and data, making use of a research products database as a knowledge generation system, to provide timely synthesis of data and information from a range of sources.

Whilst socialization is limited between head office and field office staff, it is still common between staff who are at the same location. Cooperative projects across teams make it possible for staff to discover new knowledge through the "integration of multiple streams" of tacit knowledge shared by other team members during discussions. The orientation process for new employees at both the center and the periphery also involves the transfer of tacit knowledge, though there is a risk for the knowledge discovered to be lost because the sessions are not documented.

Employee rotations between the center and periphery continue to support socialization and discovery of new knowledge, even though it's possible that staff at the periphery might not get opportunities for a job rotation and knowledge flow becomes limited to a few who do get the opportunities. Direct hire staff is rotated after every few years, which ensures they are able to socialize with a new set of people and benefit from new tacit knowledge. Whilst the organization is widely spread, technologies such as video conferencing, discussion groups and

chat have made it possible for staff that are at different locations to socialize and discover some new knowledge.

4.5.2 Knowledge Capture and Knowledge Capture Systems

Knowledge Capture Systems “support the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities”, supported by the processes of externalization and internalization (Becerra & Sabherwal, 2010:63). At AIDORG knowledge capture systems’ main objective is to capture the full spectrum of the organization’s development knowledge and making it widely accessible through the development of common operating standards and the elimination of knowledge stovepipes.

Among other knowledge capture systems at AIDORG, the Development Experience Clearinghouse (DEC), Developedia tool and online collaboration technologies, all of which provide central repositories of the expanded organizational experience, support the capture of organizational knowledge. The DEC provides a knowledge capture system that allows organizational wide documents management as well as providing a standard for organizational data management. It is available to the public online in accessible forms and formats, including options to save and share documents, as well as collaborate. Developedia is a wiki-based tool used by AIDORG and other staff for the collection and sharing of information about programs, practices and operations. Both externalization and internalization knowledge sub-processes take place through these systems; staff is able to retrieve explicit knowledge that was previously captured, and the organization is also able to retrieve tacit knowledge from staff as they share their knowledge.

With the advancement of technologies, AIDORG is also making use of social media platforms such as Facebook, Twitter, YouTube and LinkedIn to share information as well as receive feedback from different stakeholders. Through these platforms, all stakeholders with internet access are kept up to date about the latest information and developments at AIDORG, allowing them to learn more about the organization and easily retrieve the knowledge they need. Stakeholders are also able to provide comments on the information that AIDORG posts on social media, allowing the organization to capture new knowledge from outside the organizational boundaries and use it to improve development efforts.

The organization has also put in place systems to capture the knowledge that exists within it’s organizational boundaries, through the implementation and use of online collaboration spaces, blogs and communities, which are only available to agency staff through the intranet. These

spaces provide spaces for people and the organization to capture ideas, resources, and knowledge. They are critical knowledge capture systems in the organization, supporting the establishment of specific locations for operational information, and helping staff to know where to find what, as well as where to post their knowledge for maximum effect. Whilst some Missions still have their own knowledge capture systems, encouraged use of organizational-wide knowledge capture systems make it possible for the organization to break knowledge stovepipes and enhances the quality of information retrieved from these systems.

4.5.3 Knowledge Sharing and Knowledge Sharing Systems

Knowledge Sharing Systems “support the process through which explicit or tacit knowledge is communicated to individuals, by supporting exchange and socialization” (Becerra & Sabherwal, 2010:64). The main objective of AIDORG’s knowledge sharing systems is to expand the organization’s effectiveness, through the sharing and dissemination of AIDORG’s knowledge. The organization is continually working to mobilize tacit knowledge and improving the transfer of experience and expertise within the international development system in order to meet this objective.

The AIDORG Forward agenda seeks to strengthen the organization by embracing new partnerships, promoting sustainable development through high-impact partnerships and advocating for better development through learning. As a way of strengthening these partnerships, AIDORG hosts events and discussions on topics which need the input of both AIDORG and its development partners, fostering knowledge management, capturing and sharing. The organization’s experts also get opportunities to attend as well as present at knowledge management related conferences. By giving staff such opportunities to grow their networks and increase knowledge sharing, there is improved socialization with external stakeholders, and an increase in new audiences to share knowledge with, resulting in new perspectives to long-standing development challenges.

AIDORG is also developing and managing knowledge sharing platforms which promote knowledge exchange, including the Learning Lab and the AllNet Portal, online collaborative spaces for information and knowledge sharing between AIDORG and its partners. These collaboration spaces support the expansion of AIDORG expertise, strengthening staff capacity by allowing staff to effortlessly connect with a wider network of development professionals and exchange ideas that support knowledge management for development. Once the human-based knowledge is mobilized, the outputs from these online communities are then

synthesized and made accessible to other stakeholders. The organization's intranet system also make it possible for individual expertise within the organization to be identified and accessed, even though this largely depends on the awareness and participation of the experts on these knowledge-sharing platforms.

4.5.4 Knowledge Application and Knowledge Application Systems

Knowledge application systems “support the process through which some individuals utilize knowledge possessed by other individuals without actually acquiring, or learning, that knowledge” (Becerra & Sabherwal, 2010:64). The main objective of knowledge management application at AIDORG is to leverage experience, applying the development knowledge for optimal impact of programs and management practices.

The organization is taking advantage of consulting services to address the knowledge gaps that are identified in the organization's knowledge management efforts. AIDORG has a Learning and Knowledge Management contract that provides “analytical and demand-based support for the organization's collaboration, learning, and adapting (CLA) efforts” ([https://\[REDACTED\]lab.org/learn-contract](https://[REDACTED]lab.org/learn-contract)). Whilst the organization has a knowledge management branch, there is still need to learn more, develop more platforms, as well as continue to creatively engage external stakeholder, hence the need to rely on the knowledge of consultancy organizations to build this capacity through the development of CLA practices.

Knowledge application systems at AIDORG also support evidence based decision making and in an effort to support this initiative, monitoring and evaluation has been incorporated into all projects, especially at field office level where the development is actually taking place. The organization has developed standard templates which staff can use to report on the monitoring and evaluation activities, in an effort to make sure that program reporting is done in useful and usable formats. This knowledge is stored in central repositories and makes it possible for the captured knowledge, which includes lessons learned and proven results, to be applied for success replication, thereby expanding evidence based decision making in the organization. To highlight the importance AIDORG places on knowledge application systems, one of the objectives of the Global development lab is to “strengthen AIDORG's evidence base and build its capacity to apply cutting-edge data analysis and research to measure and improve development impacts” ([https://www.\[REDACTED\]/GlobalDevLab/about](https://www.[REDACTED]/GlobalDevLab/about)).

In an effort to enable an agile and adaptive development workforce, the Global Development Lab is also partnering with Regional Missions, to help give them direction in solving the

challenges being faced by the development world. Through this partnership, locally employed staff at regional missions can apply to do a rotation at the lab, with the goal of spearheading the application of knowledge gained during this rotation when they go back to their home Missions. Also, to strengthen staff on-demand learning and organizational learning, staff has access to an online learning management system, which gives access to a variety of online courses. The organization's Automated Directives System (ADS) is a web-based system and mobile application that provides guidance on the organization's policies and rules, allowing staff to apply the knowledge in these systems in their day-to-day work.

The organizational-wide IT Helpdesk for example, helps provide direction to staff when they encounter IT related challenges. Upon realizing that the challenges faced by users were common to all users, the organization is taking advantage of knowledge application to reduce support times and empower users by providing the information they need. The helpdesk support process has evolved to include a knowledge base, where expert staff documents solutions in the simplest possible way to common problems, and users can check for solutions before they call an expert for help.

4.6 Conclusion

In this chapter, the organization's knowledge management systems were described in detail. The knowledge management infrastructure, technologies and mechanisms which are currently in place in the organization were described. The different knowledge management systems which the organization is using were also described, including the knowledge management processes which are supporting these systems. During the description process, some of the improvements which could be made to the current systems were briefly discussed, and these will be explored in detail in the next chapter.

Chapter 5: FINDINGS AND DISCUSSION

5.1 Introduction

This chapter will involve the analysis of the data that was gathered throughout the research process. The research involved both quantitative and qualitative analysis of the data, both of which are explained in detail below, together with the research methodologies used for each.

IBM SPSS Statistics is one of the available software packages which can be used for the analysis process in this research. The exploratory data analysis technique, which emphasizes use of tables and diagrams to explore and understand data as well as allows the researcher to introduce previously unplanned analyses (Saunders et al, 2012:487), will be used to do the quantitative data analysis. Significance testing will also be used to compare the data collected with the research expectations, avoiding the possibility of random variation influencing the research results by answering whether there are statistically significant associations between variables, as well as the strength of the variable relationship (Saunders et al, 2012).

The qualitative data generated by the participant observation method will be summarised and grouped into themes, and then linking these to the conceptual framework in order to answer the research questions. The deductive approach, based on Becerra-Fernandez's framework will be used for the analysis, allowing data collection to start with the research question and objectives and theoretical framework. This analysis approach also links the research into the existing body of knowledge (Saunders et al, 2012). The generic analysis approach will also be used to do the data analysis, including category identification from the available literature and data, integrating the data within the identified categories to rearrange it into manageable forms, analysing the identified categories to identify patterns and relationships, testing the identified propositions against data and looking for alternative explanations, and conclusion verification (Saunders et al, 2012).

Whilst most of the qualitative data is already in electronic format, including e-mail, webpages, reports and blogs, the data still had to be prepared for analysis. Whilst quantitative data analysis uses tables and statistics to present results, there will be need to find a "balance between providing necessary contextual description and presenting analytical findings" with the quantitative analysis (Saunders et al, 2012:563). The questionnaire and observation methods will be used to find the user's perspective of how the AIDORG KMS does work.

The research objectives and the Becerra-Fernandez framework will be used to organize and present the analysis results.

5.2 Qualitative Analysis

5.2.1 Participant Observation Overview

Participant observation, whose emphasis is on discovering the meanings that people attach to their actions, was used in this research, in an effort by the researcher to immerse themselves in the organizational context and produce valid and reliable results. Whilst being an insider researcher has its advantages, there are also threats to validity and reliability; instead of doing a more objective analysis, the researcher might take some things for granted because of their familiarity with the environment.

5.2.2 Knowledge Management Infrastructure

Organization culture: One user posted this statement on the organization wide intranet in frustration over the slow adoption of a new KMS, “leadership must be involved and staff must buy in and help to define the new process”. This statement on its own highlights something that the organization is struggling with in an effort to make the KMS more effective than it is now. Whilst there is normally an executive sponsor who is in senior leadership when a new KMS is launched, there is still need for leadership at both the center and the periphery to participate more in the knowledge management processes if the rest of the staff are to buy-in. Besides the executive sponsors, the team leaders also need to add their voices in support of the KMS use, and at the periphery, senior leadership also needs to do the same.

There is need for leadership both at the center and the periphery to fully understand the benefits of a KMS to the organization as whole. Whilst it’s difficult to have a perfect KMS which meets every user’s needs, leadership needs to realize that through an effective KMS; so much more can be achieved compared to using the old ways. For an organization like AIDORG, whose main focus is development instead of technology, this may be a challenge, but it still needs to be done.

There is also need for all users to understand that every new KMS will not just start as a success, it actually requires the commitment of everyone to continuously learn and adapt to improve the knowledge management processes. Users are usually not patient, especially with new systems, when they use them and are not able to find the knowledge they are looking for, they quickly go to look for alternatives, instead leaving feedback on the system to help make

it better, for example. The organization's KMS can be more effective if both leadership and staff are more willing to participate and experiment with the systems, adjusting and adapting based on the results of their experiments with the system.

There have been some teams and some field offices that have made the commitment to work with the KMS, using the knowledge processes to improve their work. The general feeling within these groups has been that KMS are highly beneficial to both individuals and the organization at large. However, the KMS effectiveness can only improve if change management is addressed at the organizational level instead of at team level or field office level; the amount of knowledge flowing through the KMS could be better if everyone in the organization is involved.

Whilst the organization has introduced some policies which require knowledge from the periphery offices to be submitted into central repositories such as the Development Experience Clearinghouse, there is need for the organization to continue to analyse these knowledge management systems and ensure that the knowledge stored in these systems is actually being used. Full participation is therefore as important as focusing on improving organizational efficiency. The effectiveness of a KMS can be measured by whether the system is actually being used; if it's not, the organization needs to investigate whether there is need to increase the awareness of the KMS, change the knowledge format, or presentation of the knowledge.

As the organization introduces KM policies in an effort to improve KMS effectiveness, there is also need to think about knowledge curatorship; is the knowledge that is being shared on organizational wide KMS vetted and then best solutions marked, or users of the KMS will be expected to use their own judgement to decide what knowledge to use and not to use? The marking of best solutions, whilst it's good for knowledge quality, will obviously discourage other users from sharing their knowledge if they are not sure how their knowledge will be received when shared widely. There is therefore still a need to find a balance between making sure the knowledge that is in the KMS is actually useful and not discouraging users from participating. The current organizational culture seems to have a strong focus on improving organizational efficiency, without necessarily encouraging user participation, even though full user participation is crucial for knowledge flows in the KMS. Center-periphery organizations could also benefit from encouraging user participation through providing incentives, however, there will still be a need to validate the knowledge to ensure that knowledge shared is actually

valid and could be used to improve the efficiency of the organization by those who discover it.

IT Infrastructure: According to a KMS user's views, the new technologies are not the problem; rather it is a change management problem which is slowing down the KMS effectiveness in the organization. Whilst the KMS can do better to improve the proficiency of the organization, most of the users are simply not willing to change their old ways of managing knowledge.

The center (head office) definitely has better knowledge management technologies compared to the field Missions, but is not the real reason why most users at the periphery are not using the KMS to share, capture, discover and apply the knowledge that is available in the organization. One of the main issues I have observed is that quite a larger number of users at the Mission do not actually know that some of the knowledge management systems exist. So whilst the systems are available in the organization, either users at the periphery have not heard about them, or they simply are not willing to learn about a new system when they believe what they are using at the moment actually works.

So the issue is not all about how the new knowledge management systems are introduced, technologies also have a role to play. AIDORG does have field offices in mostly developing countries, where resources like reliable and fast internet are not always available. This definitely affects the organization's KMS effectiveness and user participation; because the internet might not be available when a user in the field has time to actually learn about a new KMS or share knowledge via the KMS, and the same user might never go back to learn about the KMS when the internet finally becomes available. Already, the organization's knowledge flows start getting affected because of this difference, with knowledge mostly flowing from the center to the periphery instead of vice versa.

Because the head office is in the developed world, where technologies are no longer an issue, users can share, discover and capture knowledge on the KMS in real time. On the other end, the user at the periphery where technologies are still an issue, might not be able to do these things easily. This is however something that the organization has no control of, and it will be up to the users at the periphery to make an extra effort to benefit from the organization's KMS. Most of the KMS are internet based systems, where the knowledge is all in a central place and the distributed users need internet to access.

In terms of IT equipment, the organization has made a lot of positive strides to ensure both staff at the center and at the periphery has equal access. As much as new devices are piloted using groups at the center before they are rolled out to the periphery, there is no discrimination in terms of what devices users at the center and those at the periphery have access to. The introduction of mobile computing devices has also resulted in significant improvements to the efficiency of the organization; users at both the center and the periphery are able to access the knowledge they need from wherever they are on the organization's approved devices. Whilst these devices have some limitations in terms of ease of access and security requirements, the availability of systems such as E-mail and the ADS, which users mostly rely on to find knowledge have improved the KMS effectiveness of the organization.

Organization Structure: The organization has established a knowledge management team to spearhead the organization's knowledge management efforts, but more could still be done to improve the effectiveness of knowledge management systems. The knowledge management team is mainly based at the center, which means most of their interactions are with teams at the center and not at the periphery. This has created a gap between the center and the periphery in terms of their understanding of knowledge management; teams at the center generally have a better understanding of the organization's KMS compared to those at the periphery.

A few periphery offices have a knowledge management specialist who is dedicated to support knowledge management processes, however most of the periphery offices rely on IT staff to provide training and guidance on knowledge processes which could further improve existing knowledge management processes. According to Beccera-Fernandez (2010), knowledge management efforts are likely to be better if there is a team working on it full time instead of part time. At the moment only a few field offices have a knowledge management specialist position, and those offices are generally ahead of the rest in terms of knowledge management systems use and understanding. The introduction of a knowledge management position at all the field offices could further strengthen the effectiveness of the organization's knowledge management systems, as each office would then have someone to lead knowledge management efforts, encouraging users to share knowledge organization wide, as well as use the KMS to capture and discover knowledge.

The field offices also have their own leadership and generally run their own operations, but a hierarchical structure still exists between the center and the periphery. According to Becerra –

Fernandez (2010), this organizational hierarchy affects who the users at the periphery transfer knowledge to. Whilst the top leadership at the periphery might have direct access to the teams at the center, most of the users at the periphery will not have that, and normally users will only share knowledge with those whom they have direct contact with. This therefore presents a challenge for an organization like AIDORG, as the likelihood of having knowledge flowing bi-directionally is further reduced because the organizational structure to some extent does discourage full user participation. Whilst the structure cannot be easily changed, the leadership of the periphery offices will need to implement some changes which would encourage knowledge flow between their staff and head office staff.

5.2.3 Knowledge Management Technologies

The organization's knowledge management technologies have no doubt improved knowledge management system effectiveness over the years. The shift from static to collaborative knowledge management systems have resulted in both increased user participation and KMS effectiveness. The use of the cloud as a storage service has received both positive and negative reviews in the organization, with some users being sceptical about the service due to security concerns, whilst others have embraced the improved knowledge management processes which come with the system. Whilst the concerns are there given the increased cyber-security risks, as well as the prominence of the organization, the global distribution of the organization calls for such a setup if knowledge management is to be effective.

Facilities such as chat within e-mail have made it possible for staff to be able to quickly share knowledge with their counterparts who are spread all over the world, as well as be able to easily search for that knowledge when they need it again. Whilst Chat does not necessarily support widespread sharing of knowledge because the knowledge is normally being shared with a small group of people, it still improves KMS effectiveness when compared to systems which are not collaborative. A few users still prefer to use non-collaborative systems for knowledge management, however, staff buy in has definitely increased since the collaborative systems were introduced, further emphasizing the importance of commitment and learning when new systems are introduced.

As a leader in development efforts, AIDORG does need to access knowledge shared by other donors and partners for them to succeed in their work, which means the organization needs to be able to collaborate with external partners in order improve their KMS effectiveness. This is an area which need further strengthening to increase non-AIDORG staff participation; most

systems which could be used to easily collaborate with external partners are not approved for use on the organization's networks. The organization can therefore not participate when such platforms are being used for discussions, losing out on opportunities to discover new knowledge as well as share the knowledge that's available. Increased participation of AIDORG staff could improve KMS effectiveness, however as the organization seeks to improve user participation, there is still need to be wary of the security concerns posed by these systems.

AIDORG makes use of repositories of best practices to share knowledge across the different offices. Whilst this technology makes KMS more effective, the organization still needs to do more to increase voluntary participation on these platforms and improve knowledge flows. Most users at the periphery are also not aware of the existence of the web-based repositories, which defeats the main purpose of setting up these systems if staff is not using the already existing knowledge. The organization therefore needs to do more to make staff aware of the existence of these technologies. AIDORG also sponsors some platforms where implementing partners and donors can share and discover knowledge, however, at the periphery level, this is not very published, again limiting the knowledge flow since the knowledge exists but is not widely used.

5.2.4 Knowledge Management Mechanisms

The organization has introduced a good number of knowledge management mechanisms over the years in an effort to improve KMS effectiveness. Whilst in the past, locally employed staff at the periphery did not have too many opportunities to interact with staff at the center or at other Missions, except through classroom training or conferences, this has been changing. Staff now has opportunities to enrich their knowledge as well as share their knowledge directly with staff outside their field office through multiple programs which allow staff to do a tour at the center or at another field office.

Besides increasing staff motivation, these programs have also improved knowledge flows from the periphery to the center, as well as knowledge flows directly between the periphery sites as participating staff exchange best practices and even train others. Most staff who have participated in this program, both at the center and at other periphery offices, have rated the mechanism very highly as a way to learn and share knowledge. I have also observed increased use of KMS use when staff from the periphery is participating in these programs at the center, further validating that field use of KMS use on an individual level is much lower than head

office use. The number of opportunities has also increased over the years, with more teams at the center and field offices being able to host staff from other periphery sites, however due to the competitiveness of the program and the large numbers of staff employed by the organization, participation is still limited. Whilst this mechanism could still be further improved to maximise KMS effectiveness, it has definitely improved staff participation in knowledge management processes.

Direct hire staff, still rotate posts after a few years, ensuring continuous flow of tacit knowledge within the organization, both from the center to the periphery when they are being assigned from head office, and from the periphery to the center when they go back to head office at the end of the tour. During this process, socialization is the main process for knowledge management, with most knowledge sharing and discovery happening through face-to-face interaction. This however still presents a challenge of this shared knowledge not being widely distributed if it's not shared through a knowledge management system; therefore the process could further be improved by having teams capture this knowledge in systems which are widely accessible, so that even when new people join the organization, they can easily find this knowledge and apply it, instead of having the team leader go through the same process with everyone. The success of this process also depends on the trust between the team leader and the team, and the expectation of the current process is that there will be trust between these two sides to enable effective knowledge management processes.

Due to the global distribution of the organization, language also continues to be a challenge for the effectiveness of the KMS. Whilst most staff do have a good understanding of English and will be able to understand most of what is shared on the KMS, having multiple language options on the organization's KMS could further improve participation and the flow of knowledge. This is especially true for knowledge sharing on widely accessible platforms such as the organization's intranet, if a user does not feel comfortable in a certain language; it's most likely that they would not share what they know with a wide audience. The organization could therefore take advantage of the vast knowledge available by providing options to switch to other widely used languages in order to increase participation.

New employee orientation exercises are another mechanism which could be further refined to improve participation and enrich the knowledge management systems. Currently the center and each periphery office have their own procedure for the orientation process during new users' first week. Introduction to most of the organization's knowledge management systems

is usually done during this process, and it's critical that the importance of knowledge management processes be emphasized during this stage. Whilst new staff will likely not have much to share during their first week, once they know that there are systems in place where they can find and share knowledge, this could increase staff participation on the KMS and further improve effectiveness due to increased usage of the KMS. A standardized orientation process across the organization, which includes best practices from the center and the periphery, as well as all the systems which the organization is using to manage knowledge, could therefore further improve KMS effectiveness. With such a process, it's also important that the KMS always has valid knowledge, be easily accessible and user friendly, so that new users are encouraged to keep coming back.

Technologies such as desktop video conferencing have further reduced the need for staff to meet in person, and for a global organization, it provides opportunities to easily share knowledge. At the periphery, even when the technologies are there, participation in meetings has continued to be mostly face-to-face, allowing both staff and partners to discover new knowledge through socialization. However, between the center and the periphery, regular face-to-face meetings are not always feasible, which means there is little socialization taking place. Conferences still provide platforms for the center to closely interact with representatives from the periphery, however, because the time is limited, not as much knowledge is shared as when there are regular face-to-face meetings. Technologies such as Google sites have been used to support this mechanism in the organization, from participant registration to the publishing of all knowledge shared during the conference. Whilst this could greatly improve the organization's KMS effectiveness, the challenge of ensuring that participants and other users keep accessing and updating the knowledge on these sites remains for the organization.

5.2.5 Knowledge Management Systems and Processes

5.2.5.1 Knowledge Discovery through Combination and Socialization

AIDORG has systems in place which support the discovery of new knowledge through combination and socialization. The center-periphery nature of the organization however means there is not much of socialization taking place, especially between the center and the periphery, hence there is not as much tacit knowledge flowing throughout the organization as explicit knowledge. The organization's KMS does support the discovery of new explicit knowledge by supporting knowledge to flow in and out of the organization through multiple

streams. Systems which allow knowledge to flow into the organization from external sources, for example LearningLab, allow AIDORG to then combine this external explicit knowledge and improve their knowledge management systems.

Whilst the organization has made strides in the past few years to introduce systems which support knowledge discovery through socialization, these are still limited. Platforms such as the global development lab have brought in external partners, including from universities and technological companies, and internal staff, both from the center and periphery, to work together in one place; bringing together their tacit knowledge in an effort to improve the organization's knowledge discovery systems. Whilst socialization is taking place through these efforts, there is still need for more participation by both external and internal participants in order for the organization's knowledge management systems to benefit fully from knowledge discovery processes.

Socialization as a knowledge discovery process is more effective for an organization which is not in a center-periphery setup, where staff can meet to share tacit knowledge regularly, either by design or during "water-cooler" discussions. For a center-periphery organization, socialization is mostly happening separately at the different locations, and because there is no co-location, the rate of knowledge discovery through socialization involving joint activities between the center and the periphery is almost insignificant. The frequency at which the knowledge management mechanisms such as employee rotation and retreats, which support the socialization process, take place in the organization is too low.

Combination is a better suited knowledge management process for knowledge discovery in a center-periphery organization as it involves synthesizing multiple sources to create new explicit knowledge. AIDORG already has multiple web-based knowledge management systems which staff can rely on for discovery of new explicit knowledge both at the center and the periphery. The organization already has a lot of the mechanisms which support combination in place, including collaborative-problem solving and creating documents collaboratively. The use of platforms such as Google Drive, Huddle, Google Chat, and collaborative intranet systems have significantly improved the process of knowledge discovery, allowing staff to easily discover shared knowledge, as long as it's shared with them. Whilst there have been issues where staff who originally shared the knowledge depart the organization without transferring ownership of the shared knowledge, the benefits of these

platforms far outweigh these challenges for an organization with a center-periphery organizational setup.

With a collaborative intranet system, staff are able to connect and collaborate directly with others who have similar interests throughout the organization. Whilst trust still needs to be established before full collaboration can take place, this KMS has been very popular and effective as a collaborative platform for the discovery of new knowledge. The organization however still needs to do more to encourage full participation on these platforms in order to improve the quality of knowledge staff are able to discover on this platform. Even in a center-periphery organization where cyber-security is highly emphasized, setting up knowledge management systems in ways which encourage easy and secure access are also a must in order to encourage participation, and AIDORG has made a lot of improvements in making sure it's not difficult for staff to discover the knowledge they seek from these platforms.

5.2.5.2 Knowledge Capture through Internalization and Externalization

Knowledge management mechanisms such as best practice repositories and bulletin boards supports knowledge capture through the externalization of users' tacit knowledge. Whilst the organization does have these mechanisms in place, the success of knowledge capture processes highly depends on user participation. As a global organization, AIDORG has a vast amount of knowledge which is spread all over the world, and if experts both at the center and the periphery take time to externalize the knowledge they have, the organization's knowledge capture systems are further improved. The current trend is that it's mostly experts at the center who are externalizing knowledge through these platforms, whilst those at the periphery are either not aware of the existence of the systems or they are not confident to share their knowledge with a wider audience.

The main challenge that exists with externalization as a knowledge capture process is that anyone who is a member of these platforms can externalize knowledge through these systems, but there are no systems in place to validate the knowledge that is externalized through these organizational-wide platforms. There might therefore be a need to invest more in checking the quality of knowledge before the knowledge is made accessible to everyone if the knowledge capture systems are to be more effective.

Once the knowledge is externalized on organization-wide systems, the knowledge capture systems can only be considered to be successful if the knowledge captured on the KMS is then accessed and interpreted by others through internalization. Most of the knowledge

capture systems are open to all staff by default, giving everyone an equal opportunity to access the knowledge and use it to create new tacit knowledge, however for most users, the issue is not knowing about the existence of some of the systems where knowledge can be found, especially those at the periphery. For a center-periphery organization like AIDORG it's therefore necessary to find ways to highlight the knowledge management systems which staff can use to create new knowledge, as use of this knowledge does improve organizational efficiency by preventing duplication.

The mechanisms of observation and face-to-face meetings are mainly applicable within offices as internalization processes rather than organizational wide; staff can capture new tacit knowledge by observing how their colleagues or team leader does tasks within their offices as well as internalizing knowledge which is shared during face-to-face meetings. For most staff at the periphery, face-to-face meetings with their counterparts at other sites are not feasible, with video conferencing being the closest way to capture knowledge through meetings between the center and the periphery staff. Whilst the use of recorded videos could be another way of learning through observation, this practice is not widely used in the organization presently to support knowledge capture, but it's something that center-periphery organizations could use to aid the process of internalization, especially for new staff. The process of internalization at AIDORG as a knowledge capture process is also supported by on-the-job training and learning by doing.

5.2.5.3 Knowledge sharing through socialization and exchange

In a center-periphery organization, knowledge sharing is of utmost importance to the success of the organization's knowledge management efforts. The process of socialization, which was already discussed under the knowledge discovery section, is also used to share knowledge in the organization. Google chat is the most common technology which is being used to share knowledge through socialization in the organization currently, where an individual can explain their tacit knowledge to a small group. However, socialization would not be described as an effective knowledge sharing process for center-periphery organizations as this knowledge does not quite flow organizational wide when it's shared within such small groups, unless if one of the recipients externalizes it on other more accessible knowledge management systems.

According to Becerra-Fernandez (2010), the knowledge sharing process focuses on communicating the knowledge to others. AIDORG has done a lot to ensure that knowledge is

shared, both with staff and external partners, through the exchange process. King (2005) highlights that when knowledge is shared, it can be used to facilitate innovation and collaborative problem solving, both of which are critical areas for AIDORG as it continues to partner with other development giants to provide solutions to the most pressing development challenges. There is however need for more training to ensure staff and partners know how to effectively use these systems to share knowledge.

Whilst the process of exchange is effectively supporting knowledge sharing in the organization, there is still a challenge of making sure that sensitive knowledge does not leak outside the organization's boundary. Manuals are a common platform for knowledge exchange between the center and the periphery and they have been an effective means of sharing knowledge, for example when the organization is implementing new systems, when it's not feasible to gather everyone together, online manuals are used to provide step-by-step instructions and have been effective. The manuals will normally have owners, who will be responsible for maintaining the knowledge shared and making sure that it's still valid.

Knowledge exchange through presentations has also been effective for knowledge shared at AIDORG. The use of new technologies such as Adobe Connect has transformed the way these presentations are done in the organizations for the better, creating another powerful tool to share knowledge when staff is not in one place. Whilst there is a question of staff honesty when this platform is used for mandatory training because staff might not necessarily be there throughout the online presentation, the fact that knowledge can be easily exchanged through this platform makes it an effective tool for knowledge sharing in center-periphery organizations.

5.2.5.4 Knowledge Application through routines and direction

In an organization with a lot of rules, procedures and policies, knowledge application systems makes it possible for staff to necessarily know everything before they are able to do their work. Helpdesk systems are the main mechanism used in the organization to provide direction to staff both at the center and the periphery as they do their work, and in most cases these have proved to be effective for knowledge application as staff is able to take directions and apply them. Whilst these are mostly based at the center, the organization has established processes to make them easily accessible via either e-mail or phone, and they could be an effective knowledge application system to other organizations with the center-periphery setup.

Most of the organization's knowledge application systems however are using knowledge that is embedded in procedures such as policies and other organizational standards to guide users' behaviour. Whilst staff do not necessarily have to know all of the policies and standards, when they need to refer to them, the organization has made them easily accessible, including on mobile devices.

5.3 Quantitative Data Analysis

5.3.1 An Overview of Questionnaires

Whilst questionnaires are normally used to do survey research, case study research can also use this method (Saunders et al, 2012). To ensure sufficient responses, self-completed, delivery and collection questionnaires were used, in combination with the observation research method. According to Saunders et al (2012), responses to self-completed questionnaires are unlikely to be answered to please the researcher or because they are more socially desirable, however there is still room for responses to be contaminated when respondents discuss their responses.

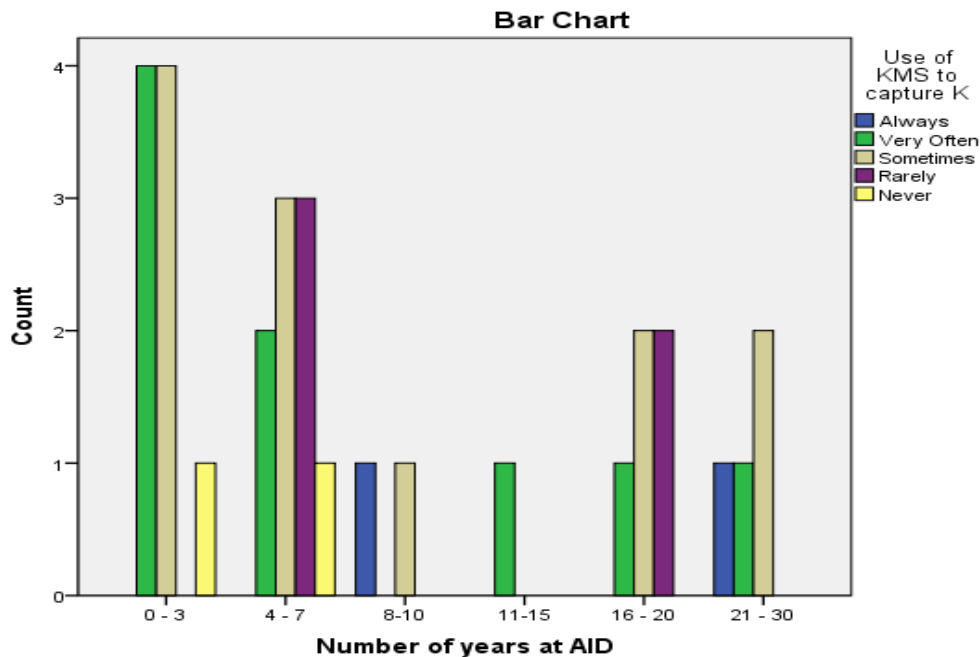
The available literature and the theory selected for this research shaped the data collection questions which were used in the research, and the categories for the data analysis also emerged from the questions (Saunders et al, 2012:580). For the purpose of exploratory research, the questionnaire was mainly focused on the AIDORG periphery office in Zimbabwe in order to reduce the time needed for delivery and collection questionnaires in a geographically dispersed environment. A sample of 45 was selected through stratified sampling out of 85 users, and 30 responses were received. This sample was representative of the general population in the organization, and the response rate allowed me to have confidence in my data and be able to generalize the findings.

5.3.2 Use of the KMS for Knowledge Capture, Sharing and Discovery

Figure 5.1 below shows the current trend of using the KMS to capture knowledge in the organization. The data collected shows that staff who are still relatively new to the organization, that is the 0-3 and 4-7 groups, use the KMS to capture knowledge more frequently than those who have been at the organization for longer. This could be an indication of the increased use of KMS over the past few years than in the past, and because the new staff are joining the organization when the systems are being introduced, it's easier for them to start using the KMS. Staff who have been with the organization for longer

however have gotten used to old ways of capturing knowledge and their frequency of using the KMS for that knowledge process is lower.

Figure 7: Use of KMS to capture knowledge

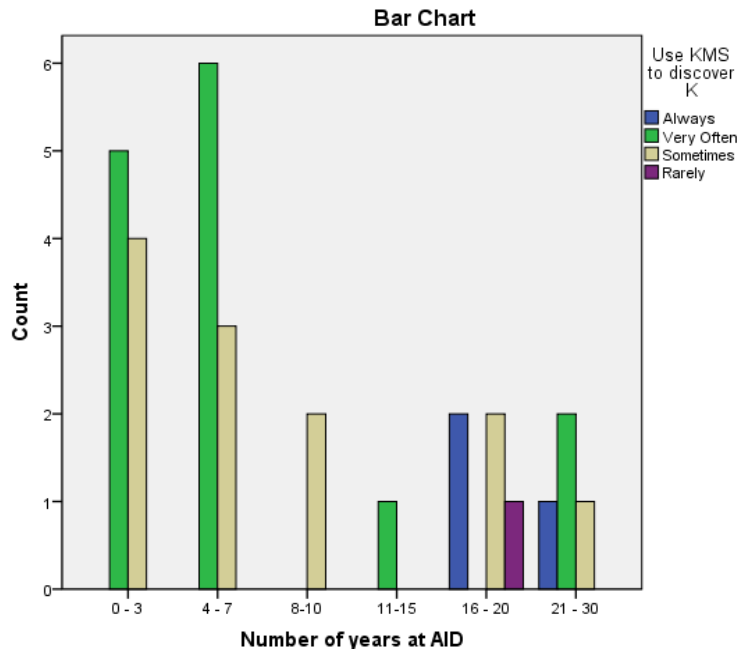


However, the newer staff also introduce an interesting trend, where they show some numbers in the *Never* category as well as no numbers in the *Always* category. This could be an indication of a challenge with the organization's orientation process when new staff joins the organization; as this is most likely happening because new staff is not aware of the existence of the KMS and therefore never use it to capture knowledge. Whilst there is a high trend of KMS use to capture knowledge, based on the high frequencies for *Very Often* and *Sometimes*, there is need to get this group to *Always* use the KMS to capture knowledge if the organization's KMS is to be effective, otherwise knowledge continues to stick in one place when it's not available for others to access.

Figure 5.2 below shows the trend of using the KMS to discover new knowledge amongst the users in the organization. Similar to the knowledge capture process, it's the groups which are relatively new to the organization who are using the KMS to discover knowledge more, presumably to find more knowledge about the organization. The data collected also shows that none of the categories had a *Never* for the knowledge discovery process, an indication that even though users may not be contributing to the organization's KMS regularly; they still

refer to the KMS at some point to discover new knowledge. This could imply that the periphery is mainly using knowledge that is posted from the center instead of vice-versa, and there is need for there to be a shift so that organizational knowledge flows in both directions.

Figure 8: Use of the KMS to discover knowledge



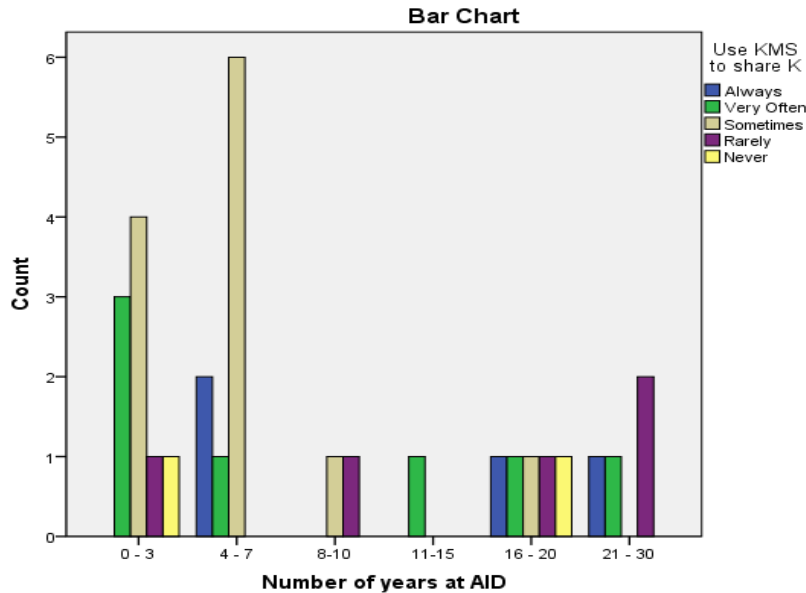
However, it could also be a positive for the organization, in the sense that users are actually using the KMS for knowledge discovery more than any other process because they are finding valid and useful knowledge on those systems.

Figure 5.3 below shows the current trend in the organization in relation to using the KMS to share knowledge with others. The newer groups consistently show high frequencies of KMS use even for the knowledge sharing process; this could be an indication that these users are finding new useful knowledge on the KMS and also share their knowledge with others so they can also help those who are new to the organization. However, unlike the knowledge discovery process, which had no *Never* category, the 0-3 group also shows there are some users who never share their knowledge on the KMS.

This could also be an indication of the need to do more to emphasize the importance of the KMS during the orientation process for new staff, including making sure they know about the available systems and what knowledge they can share on those platforms. The other trend which we can observe from this data is that knowledge sharing is generally the least common

knowledge process in the organization; there are more groups showing the rarely and never category in knowledge sharing than any other process.

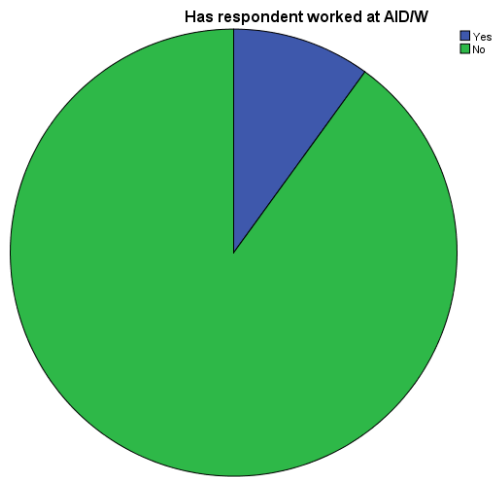
Figure 9: Use of the KMS to share knowledge



For the *8-10 and above* groups, this presents a challenge for the organization as these are the groups who have been at the organization for long periods of time and have a lot of tacit knowledge which could benefit the new staff and the organization at large if it is shared. If this tacit knowledge is not shared on the KMS, staff has to rely on socialization to gain access to this knowledge, which is a huge challenge given the geographical spread of the organization.

The questionnaire also included a question which asked users whether they had worked at the AIDORG/Washington offices before (question 3, General section). The purpose of this question was to do an analysis of whether working at the center had any effect on the users' knowledge management system usage behaviour and the chart below shows the responses.

Figure 10: AIDORG/Work experience

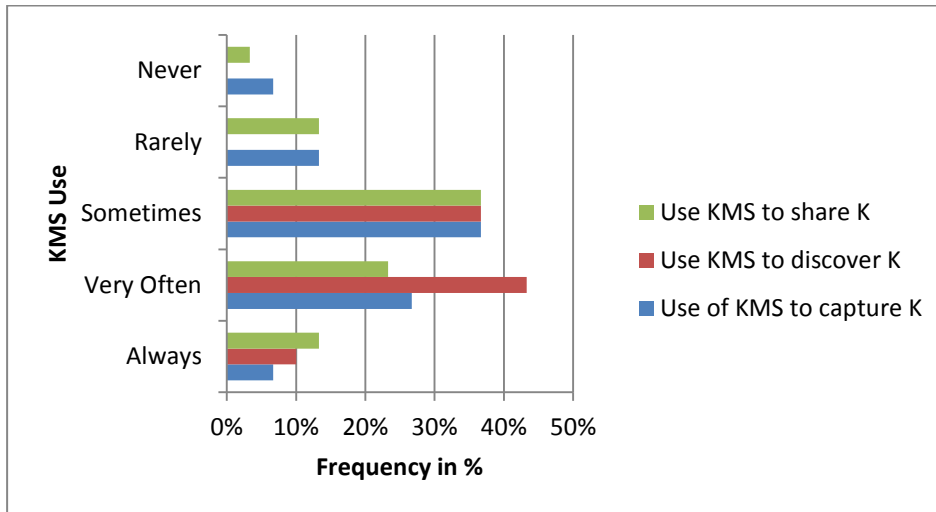


A cross tabulation of this variable and the use of KMS to capture, discover and share knowledge was done, resulting in the table below for all the *No* responses to the question of having worked at AIDORG/W. The response rate for *Yes* was too low for this question and results were deemed not to give a true representation and an analysis was only be done for those who have not done a rotation at AID/W as this represents the majority.

Table 1: Responses from staff who have not worked at AID/W

	Always	Very Often	Sometimes	Rarely	Never	Total
Use of KMS to capture Knowledge	6.70%	26.70%	36.70%	13.30%	6.70%	90.00%
Use KMS to discover Knowledge	10.00%	43.30%	36.70%	0.00%	0.00%	90.00%
Use KMS to share Knowledge	13.30%	23.30%	36.70%	13.30%	3.30%	90.00%

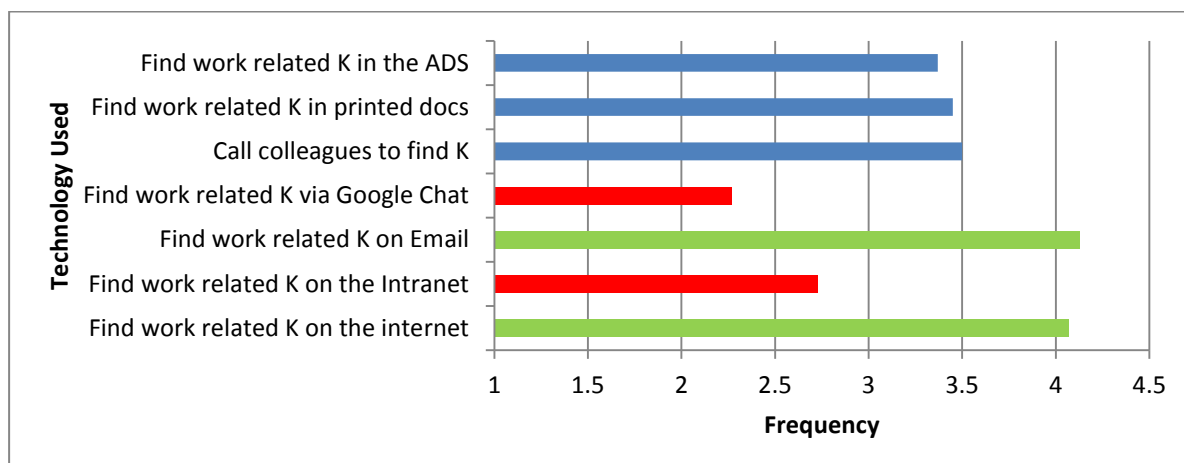
A graphical representation of this data in Figure 5.5 below is shown below:

Figure 11: Use of KMS to share, discover and capture knowledge

The graph shows that there is a very small percentage of periphery staff who have not done a rotation at AID/W and are “Always” sharing, capturing and discovering knowledge using a KMS. In the “Very Often” category, use of the KMS to discover knowledge is highly ranked compared to the other two processes, an indication that staff at the periphery are mostly referring to the KMS to find knowledge rather than contribute knowledge. There were also zero scores on the “Never” and “Rarely” categories for knowledge discovery, but there are scores for the other two processes; also an indication that the most popular knowledge process in the organization is knowledge discovery.

5.3.3 Knowledge Discovery Technologies and Systems

The questionnaire was also used to find out from users which technologies they generally prefer to use to discover or capture organizational knowledge when they are doing their day-to-day work. The figures below represent the users’ behaviours in relation to knowledge discovery.

Figure 12: Knowledge Management Technologies Trends**Table 2: Knowledge Management Technologies – Distributed Statistics**

	N	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Find work related K on the internet	29	4.07	0.178	0.961	-0.923	0.434	0.134	0.845
Find work related K on the Intranet	30	2.73	0.235	1.285	0.224	0.427	-0.984	0.833
Find work related K on Email	30	4.13	0.224	1.224	-1.358	0.427	1.031	0.833
Find work related K via Google Chat	30	2.27	0.214	1.172	0.54	0.427	-0.65	0.833
Call colleagues to find K	30	3.5	0.248	1.358	-0.752	0.427	-0.684	0.833
Find work related K in printed docs	29	3.45	0.225	1.213	-0.451	0.434	-0.693	0.845
Find work related K in the ADS	30	3.37	0.227	1.245	-0.19	0.427	-0.96	0.833
Valid N (listwise)	28							

The bar chart labels represent the mean for each technology, based on a scale of 1-5, with 5 being the mostly used. Whilst the expectation is that staff will be using the technologies which are mainly leading them to the organizational KMS, the results show that the internet is

one of the most commonly used platforms for organizational knowledge discovery. Whilst the high usage of the internet to discover knowledge could mean that the organization's knowledge is readily available outside the organizational boundaries, there is also a possibility that staff is not finding what they need within the organizational boundaries and have to rely on the internet to find the knowledge.

The usage of the intranet to discover knowledge on the other hand, is one of the lowest. Given that the intranet is where staff would expect to find most of the knowledge they need for their day-to-day work, ideally intranet usage should be higher than internet usage for the discovery of organizational knowledge. The low usage could mean that not much knowledge is being shared through the intranet and staff don't usually find what they need, or it could mean that the system is not easy for staff to use. However, the fact that the intranet system is still relatively new could also explain the low usage to discover knowledge.

Email is also highly ranked as a knowledge discovery system. Whilst the knowledge in the mailboxes is not widely shared, it's a good thing that staff do refer to their old e-mails to discover new knowledge. Due to the center-periphery nature of the organization, there would be a lot of e-mail exchanges between staff at the center and those at the periphery, and most of the time, the knowledge shared via e-mail is not necessarily shared on other widely accessible platforms. Email therefore remains an effective knowledge management system for the center-periphery organization, especially given the technological advancements which make it possible for staff to access the knowledge in this system relatively easily.

Whilst the e-mail system includes Google chat, a collaborative feature which could be used to quickly discover knowledge from colleagues, the figure above shows that it is not as widely used as e-mail. In the past, chat was not a very common knowledge sharing platform for sharing professional knowledge, but with improved search capabilities which allow users to easily retrieve past chat messages, this could be a powerful tool for the center-periphery organization when staff need to quickly share knowledge and be able to easily retrieve it. There might be need for the organization to invest in training staff on the benefits of using Chat technology for organizational knowledge sharing knowledge instead of using it for social purposes only. The low usage of chat might also be an indication that staff at the periphery is mostly sharing their knowledge with each other, rather than with those at the center, so they are rarely using chat.

The figure also shows the Automated Directives System (ADS) as a widely used system for knowledge discovery. The internet based ADS provide the mandatory policies and guidelines which users are expected to adhere to, and this could explain the high usage of the system for discovering knowledge. This could also imply that staff is finding valid and useful knowledge on this system when they access it and the organization could apply the same model used on this system when they deploy new KMS, though it could also just be an indication of the nature of knowledge which is available on the system (mandatory policies). The use of the system also indicates a high level of knowledge application, with staff mainly using direction from the system and not necessarily developing routines, which they can use later without necessarily referring to the system all the time.

The data also indicates a high level of referring to printed documents for knowledge discovery. Whilst the amount of knowledge available in print has significantly gone down with mobile computing advancements, this indicates that some users are still comfortable with printed media compared to accessing the knowledge online. This then requires the organization to put in place robust document management systems, so that when staff does refer to printed media, the correct documents are easy to find.

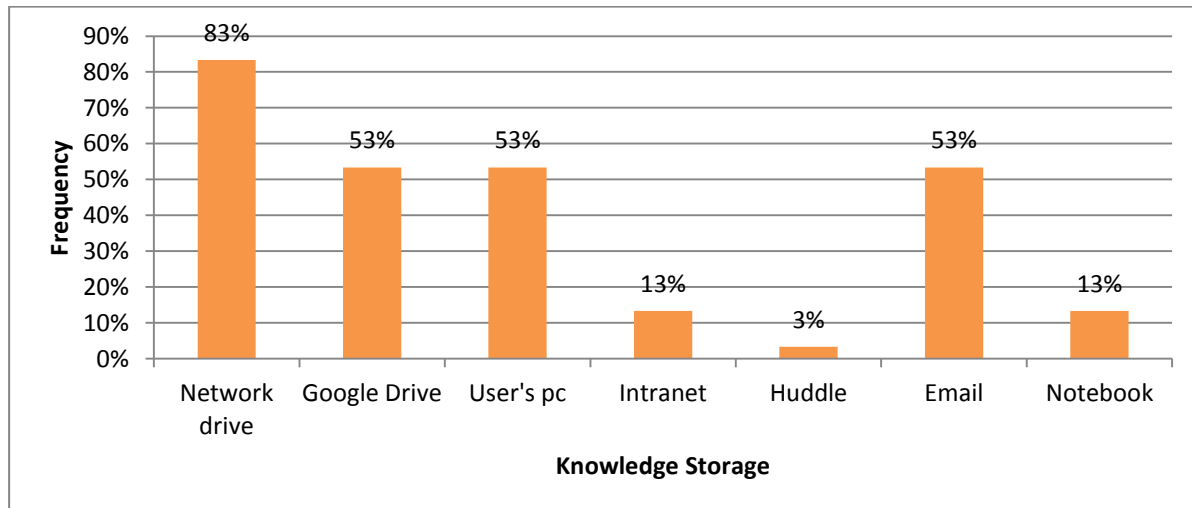
The data in the distributed statistics table, Table 5.2, further corroborates the analysis above; internet and e-mail were the mostly highly rated selections for knowledge discovery, and they show a mean which is 4+ (based on a Likert scale of 1 to 5), and they are the only two options which show a positive Kurtosis, which means that whilst there might have been differences in users' responses, the distribution was generally normal. Google Chat and Intranet were the least ranked technologies, with a mean which is below 3 as well as negative values of Kurtosis, which implies that users' responses for these options were not normally distributed. The options of using the ADS, printed documents and calling colleagues to find knowledge, whilst they have a mean of 3+, they also show negative Kurtosis values, which indicates that the responses were also not as normally distributed.

5.3.4 Knowledge Sharing and Capture Technologies

The question of where users normally store knowledge was asked to find out where users prefer to store/capture knowledge, given the numerous options which are available in the organization, and based on their responses, do an analysis of whether the technologies or systems being used for knowledge capture are supporting the organization's knowledge

management systems. Figure 5.7 below shows the percentages for each option that was available.

Figure 13: Knowledge Storage Frequencies



The network drive remains the most popular knowledge storage option at the periphery, with 83% of the respondents selecting that option. Whilst this works very well as a knowledge capture platform, it has limitations for a center-periphery organization as the knowledge stored on the network drive can mostly be shared by the users within that periphery and not organization-wide. Its popularity could be based on the fact that the option has always been there, it's considered an "old" technology, and staff is now comfortable with how it works. Google Drive and E-mail were rated equally, which means most users are using both e-mail and Google drive to capture knowledge.

Whilst Google Drive is a far much better option for knowledge capture/storage because of its better capabilities compared to the network drive, it still scored lower, most likely because it's still relatively new and users are still learning the system. However in terms of making knowledge access easier, it's one of the best technologies available in the organization as knowledge can be shared with anyone within the organization, and ownership can be transferred when the original owner is leaving the organization. Email also gives users the ability to organize their e-mails in a way which works for them, making it easier for them to easily find the stored knowledge when they need it. The storage of knowledge on users' computers was also selected by 53% of the respondents, which would be a concern for the organization's knowledge management efforts, as this knowledge is not widely accessible and could also easily get lost with hardware failures and staff movement. There is therefore need for staff to move away from this practice and use more robust knowledge capture options.

Huddle was the least frequently selected option for knowledge capture. Whilst this knowledge capture system has similar, and to some extent, better capabilities for knowledge management than Google Drive, very few users are using it in the organization. The system is still relatively new to the organization, but indications are that the users at the periphery lack the awareness of the effectiveness of this system as a knowledge management system. The low frequency of the Notebook for knowledge capture is however good for the organization, as it indicates that even staff at the periphery are embracing technology and might be moving away from options which are vulnerable to easy loss of data and which make knowledge sharing difficult.

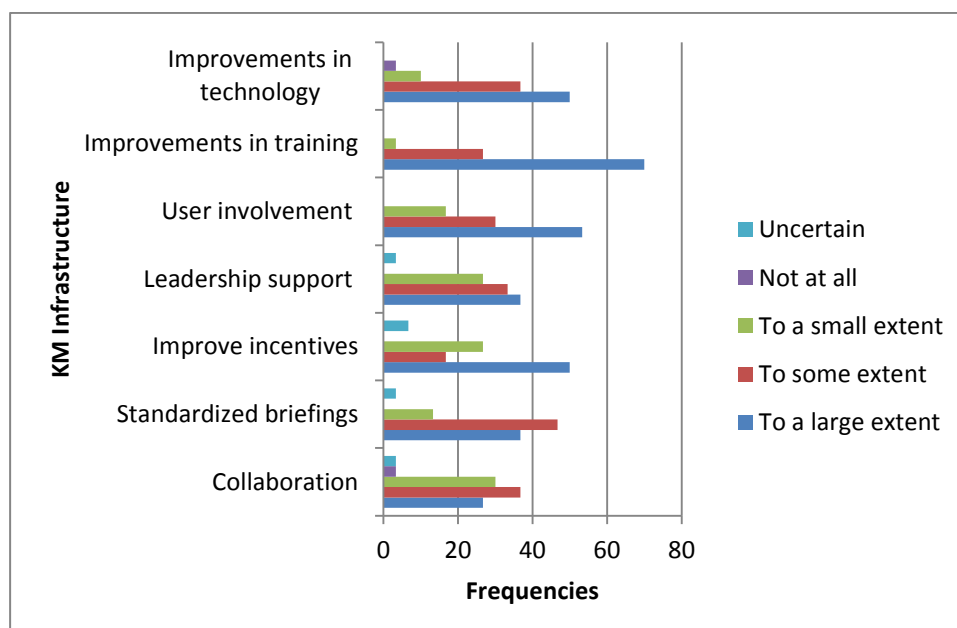
The intranet, even though it's a collaborative system which includes chat and connecting with colleagues both at the center and other periphery sites, was also one of the least selected. This could be an indication that staff is mostly accessing the intranet when they are looking for new knowledge, rather than when they have some knowledge to share. A variety of factors, including trust and language barriers, all come into play when it comes to broadcasting knowledge organizational wide. The organization has put in place measures to allow staff to share knowledge with certain groups only and not necessarily everyone in the organization, but this does not seem to have encouraged regular use of the system for the capture or sharing of knowledge. There is therefore need for more to be done to encourage more bi-directional knowledge flow on this system if it is to become a more effective knowledge management system.

5.3.5 Knowledge Management Infrastructure

The questionnaire also had a question which asked users' opinion about what was the most critical knowledge management infrastructure change that needs to happen in the organization to improve the productivity of the organizational KMS (Question 5, Organizational productivity section). The table and chart below shows the distribution of the users' responses to this question.

Table 3: Knowledge Management Infrastructure changes

	Collaboration	Standardized Briefings	Improve Incentives	Leadership Support	User Involvement	Improvements in Training	Improvements in Technology
To a large extent	26.7	36.7	50	36.7	53.3	70	50
To some extent	36.7	46.7	16.7	33.3	30	26.7	36.7
To a small extent	30	13.3	26.7	26.7	16.7	3.3	10
Not at all	3.3						3.3
Uncertain	3.3	3.3	6.7	3.3			

Figure 14: Knowledge Management Infrastructure Changes

The chart and table above show that in terms of knowledge management infrastructure, training is required to a large extent more than any other. There were also no respondents who were uncertain or thought that more training was not needed at all; an indication that most of the respondents feel that they could start using the KMS more if they are well trained, or if the training process is improved. Currently KMS training at the periphery is conducted by the Information Technology (IT) staff, whilst at the center it's conducted by the knowledge

management team, and this could be something that needs to be changed so that the same teams are conducting training everywhere.

Other factors which were ranked highly if the organization wants to improve KMS productivity include user involvement, technology improvements and improved incentives. A high ranking for user involvement might be an indication that users would like to be consulted more when the organization is implementing new knowledge management systems, so that the systems meet their needs, which would then ensure more usage of the KMS. Improvements in technology also indicate that the periphery does not always have technologies which are as reliable as the center, and this could be limiting the flow of knowledge from the periphery to the center. Currently the organization does not have that many incentives to encourage improved use of the KMS; as the organization introduces new KMS, it might be worth using incentives to encourage staff to start using and contributing to these systems.

A small number of respondents indicated “Not at all” for improved collaboration, and this could indicate that staff is not aware of the benefits of collaboration as a knowledge management tool, a challenge which could also be addressed by more training. There were also a few respondents, who indicated uncertainty about improved leadership support and standardized briefings, however, there were more respondents who indicated that these were needed to a large extent and to some extent.

5.3.6 Knowledge Management Mechanisms

A number of knowledge management mechanisms are currently being used in the organization to support the organization’s KMS, and question 4 under the KMS usefulness section sought users’ opinions about the usefulness of these mechanisms to support knowledge management systems. The tables and figures below show the distribution of the users’ responses.

Table 4: Knowledge Management Mechanisms frequencies

	Fellowships	Conferences	Retreats	TDY	Interoffice meetings	Partners meetings	Team discussions	General discussions
Most important	4	10	0	7	3	5	8	2
Important	3	8	4	6	12	8	9	2
Mildly Important	4	9	13	5	11	13	10	11
Could be Unimportant	4	2	8	1	0	1	0	8
Least Important	2	0	2	3	4	2	3	7
Not applicable	13	1	2	8	0	1	0	0

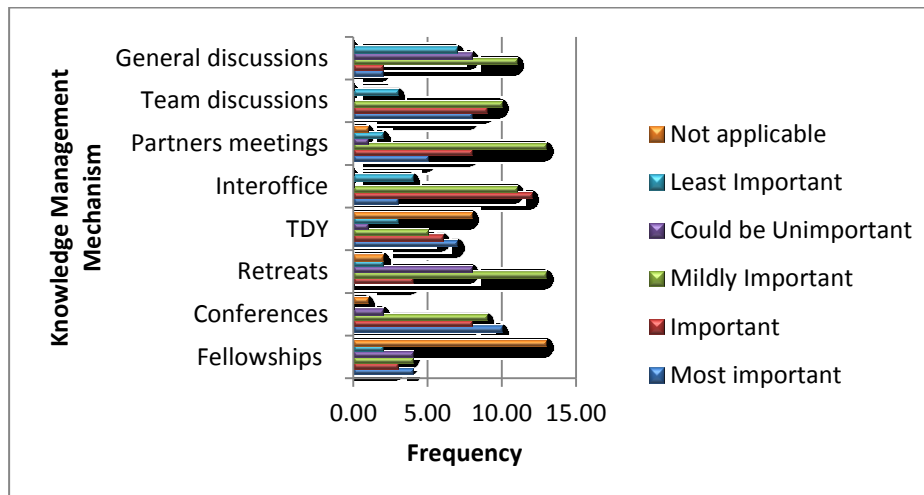
The table above shows the frequencies for each mechanism, and table 5.4 below shows the descriptive frequencies for each. Whilst most of the mechanisms were ranked highly in terms of importance, conferences were one of the highest ranked, with most users selecting it as one of the most important mechanisms for knowledge management in the organization. This highlights the importance of networking for knowledge flow in the organization, as conferences provide a platform for the users at the periphery to network with their colleagues at both the center and other peripheries who are doing the same work. A positive Kurtosis also confirms normal distribution for this mechanism, and the organization could use these views to further strengthen their knowledge management processes.

Table 5: Descriptive Statistics for the knowledge management mechanisms

	N	Mean		Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error	Statistic	Std. Error
Conferences for K sharing/discovery	30	2.23	.218	1.077	.427	1.813	.833
Retreats for K sharing/discovery	30	3.57	.207	.809	.427	.223	.833
Fellowships for K sharing/discovery	30	4.20	.347	-.501	.427	-1.274	.833
TDY for Knowledge sharing/discovery	30	3.37	.364	.239	.427	-1.591	.833
Inter-office meetings for Knowledge Sharing and Discovery	30	2.67	.205	.878	.427	.490	.833
Partners' meetings for knowledge sharing/discovery	30	2.67	.221	.824	.427	1.096	.833
Team discussions for Knowledge sharing/discovery	30	2.37	.217	.802	.427	.360	.833
General discussions with colleagues for Knowledge discovery/sharing	30	3.53	.208	-.465	.427	-.107	.833
Valid N (listwise)	30						

Also of interest to note from the two tables above is that whilst Fellowships and Temporary Duty (TDY) were ranked as “most important” and “important” by a reasonable number of respondents, they also had the highest numbers for “not applicable”. The fellowship program allows locally employed staff at the periphery to do a rotation at the center, and the TDY program allows all staff to do rotations at other periphery sites. Whilst the programs are highly regarded as important by those who have participated, there is quite a large number who have not had the opportunity to participate in these programs, mainly because of the competitive nature of the programs. The negative Kurtosis values in the table above also confirms the uneven distribution of the responses; therefore whilst the programs have been effective, there might be a need to do more if the mechanisms are to support knowledge management systems.

Knowledge management mechanisms which generally involve discussions were generally ranked “mildly important” and above, except for general informal discussions with colleagues.

Figure 15: Knowledge Management Mechanisms rankings

This could be an indication of how much staff does value opportunities to share knowledge with colleagues who are in their fields both within and outside the organizational boundaries. Mechanisms such as inter-office meetings, team discussions and partners' meetings all show normal distribution. This could be an indication that for a center-periphery organization, staff does value platforms which encourage the formation of communities of practice.

5.4 Conclusion

In this chapter, a qualitative and quantitative analysis of the knowledge management systems in use at the organization was done to reveal the actual use of KMS at AIDORG. The qualitative analysis revealed that the organization has invested a lot of effort in establishing knowledge management systems in the last few years, however, the systems are not being as effective in terms of periphery participation; the center is consistently using these systems more than the periphery. The quantitative analysis, based on the users' responses, also revealed that whilst the tools which staff needs to participate in the knowledge management processes are available, most of the staff is mainly using the KMS for knowledge discovery and knowledge application, but not for knowledge capture and knowledge sharing. Most of the staff however valued the collaboration opportunities which they have within their teams and with partners, and consider them effective for knowledge management processes. Based on these views, Communities of Practice (CoP) will therefore be explored in detail in the chapter as one of the solutions to the center-periphery organization's knowledge management efforts, and the knowledge management systems which could best support this mechanism.

CHAPTER 6: CONCLUSION

6.1 Introduction

Whilst the organization has increased efforts to capture and share lessons, resulting in substantial knowledge management systems and volumes of knowledge assets available to employees, this has still not resulted in the knowledge management system effectiveness that the organization had hoped for. Rather than focus on introducing new knowledge management systems, the organization therefore needs to take targeted actions to improve knowledge management system effectiveness; including increasing connectivity and knowledge flows at certain points in the organization as well as reducing it at some, and increasing focus on technical and organizational initiatives which promote improved collaboration.

Collaboration tools are currently available in the organization, however the quantitative analysis done in the previous section shows that these are not being utilised that much for knowledge management processes. Based on this observation, we can speculate that knowledge management systems do not replace people as a source of knowledge and Communities of Practice (CoP), because they involve people, remain critical for knowledge transfer and creation in the organization. However, whilst collaboration is critical for KMS success, simply increasing collaboration efforts could also drain the organization's resources; the efforts need to add value to the organization. The integration and creation of knowledge within a CoP is not only intellectual, but is also characterized by the alignment of social, structural, strategic and technological process; therefore the organization needs to plan, organize and nurture CoP as part of their knowledge management strategy.

6.2 A Practice Based KM Approach

We have seen that the character of the KMS at AIDORG is typical for center-periphery organizations, where the center acts as the publisher/knowledge creator, and the periphery are mainly users/implementers of the knowledge produced, curated and disseminated by the center.

However, at AIDORG, and presumably many other center-periphery organizations, the field offices is where the knowledge has to be actionable and where the practices that deliver on the mission of the organization are embedded. An approach to knowledge management, and the KMS to deliver it, that loses sight of the organizational practices, risk that the knowledge

management will not provide support where it is really needed, and will not facilitate feedback from the periphery to the center. It's therefore argued here that a more practice-based approach might turn the one-way flow of knowledge from center to the periphery into a two-way interaction. There is therefore need for the organization to identify the KMS needs and define the infrastructure needed without necessarily investing in fancy technology.

Generally there is an overreliance on specialists at the center in the organization for problem resolution, even in situations where there might be other staff within the organization who have solutions to those problems. There is need for more room for peripheral participation, to allow members from the periphery to also bring new ideas which benefit the organization. The organization needs to identify staff at the periphery offices that are knowledgeable and experienced but are not necessarily sharing knowledge outside their areas of operation. The highly skilled staff at the periphery could be the CoP coordinators at the local level, facilitating interactions within the organization when staff seek solutions and eliminating the inefficiencies which are resulting on reliance of support from the center only, as well as allowing the knowledge management specialists at the center to spend more time capturing and sharing knowledge organization wide.

The norm in the organization is that during face-to-face or virtual meetings, most times periphery voices are not heard. CoP could help transform this practice and help members to learn about each other by re-designing meeting's agenda so that it includes presentations from the periphery, both in a face-to-face and virtual setup. CoP could therefore be an effective means for the organization to recognize and adjust the influence of those who are too prominent and those who are marginalized in the community.

The geographical distribution of the organization also makes it susceptible to small networks which are based on geography; one region could discover knowledge which they only share within their region and not necessarily extend it to other regions because they don't know anyone else at other periphery sites that might need the knowledge. Language barriers, time zones and the lack of personal relationships also mean staff will most likely only share knowledge with a limited number of the organizational members. Organizational wide functional CoP however, do have the potential to increase the probability of this knowledge flowing to other regions, especially as the members get to know each other and the different skills and abilities of the community members.

CoP benefits include individual, community and organizational levels. Individual CoP benefits include improved reputation, better understanding of organizational operations, and increased trust levels; the CoP environment encourages interaction and learning. The increased access to experts and other knowledge resources also allow members to develop professionally. CoPs also allow free expression of creativity and thinking outside the box, resulting in increased idea creation, quality of knowledge and creating a common context for the community. For the organization, the increased communication levels between the CoP members would result in time savings, an increase in successful projects and innovation (Millen et al, 2002:71).

A lack of awareness of the skills and knowledge available within the organization could be a substantial barrier to collaboration; and the organization needs to put in place improvements which would help to build awareness of “who knows what” within the organization, as well as ensure expertise location in the CoP is not cumbersome. Technologies such as websites, which do not just push more information to the members, could therefore be used more to make information about members’ expertise available and increase awareness of members’ knowledge and skills; other members would be able to pull this information when the need arises and the opportunities for improved learning and knowledge transfer in the organization are also improved. The members profile shared also needs to focus on information that creates legitimation in their professional context, as well as any personal information which could help to start a discussion between two members.

AIDORG invests a lot in staff training, and CoP would also allow the organization to leverage the investments made in these training programs by creating a direct link between learning and performance. Most CoP maintains knowledge in a central repository, giving CoP members the ability to easily locate and apply the existing knowledge in new situations or contact those who developed the artefacts. The organization is then able to respond quickly to complex issues when there is improved access to the expertise required to solve them; even with its geographically spread setup. It is however important for the organization to ensure that the knowledge available in the repositories is relevant as well as useful to the CoP members and the organization.

6.3 How CoPs fit at AIDORG

Whilst the organization continues to discover the important role knowledge plays in increasing the impact of its development work, there is a realization that technology and

formally structured knowledge management systems are not enough for effective knowledge management processes. Because of their ability to adapt to meet diverse contexts, CoP are a vital component of any organization's knowledge management strategy, and it's vital for AIDORG to legitimize CoP and establish their place in the organization, as well as integrate them with organizational processes.

Increased knowledge reuse and employee learning is one of the common CoP objectives, however it takes CoPs which also promote knowledge creation and transfer to promote KMS effectiveness and efficiency. The hierarchical organization structure which is found at AIDORG is normally listed as a factor in the wide dispersion of connectivity in organizations, undermining the knowledge transfer process and reducing the CoP benefits. Normally in such an organizational structure, the CoP members at the center have closer connections to those at the center compared to the periphery. The expertise of a few well-connected staff in their own CoP would result in knowledge not flowing organization-wide despite the potential benefits of that knowledge.

There is therefore need for AIDORG to introduce more policies which would encourage increased collaboration between the center and periphery staff, as this would improve consistency within the organizational functions as well as avoid duplication. Some of the suggestions for improving CoP connectivity and knowledge transfer between the center and the periphery are to introduce "knowledge brokers", who will be designated as go-to people in the CoP when members have questions. The brokers could also be assigned the task of reaching out and recruiting more periphery members to the CoP so that knowledge continues to flow as new members also share what they know. It's also critical that the CoP brokers be widely distributed in the organization and not just be focused at the center or in one region, in order to decrease CoP vulnerability to staff departures at the regional or periphery level.

CoP help to reduce the learning curve for staff joining the organization when there is access to mentoring and assistance within the CoP. According to Lesser et al (2001:836), "the ability to quickly assimilate individuals into the methods, tools, and activities of a new position represents an important capability". CoP enable new staff to quickly learn both the technical and cultural aspects of organizations by fostering relationships between the new staff and the established employees, who can quickly reach out to each other to ask questions about their work. Through mentoring relationships and training courses that are developed in CoP, staff is also able to exchange knowledge which is not available in any other organizational archive.

AIDORG already has mentoring programs at both the center and periphery levels, and these could also be used within the CoP to transfer expertise and reduce the susceptibility to the collapse of the community which is created when central members leave the organization. When new members join a CoP, they might struggle to be heard even when they have the expertise to help the community because the existing members have already established relationships over time; the organization's CoP could use mentoring programs to integrate new members into the community and ensure the organization benefits from their skills.

Mentoring could also be leveraged in the CoPs to help the experts in the community, who are mostly spending time transferring knowledge to others within the organization, to join external CoP and also learn from other broader CoPs. The diversified networks would improve their learning and effectiveness, as well as help avoid bottlenecks in the organization as there is knowledge flowing from outside the organizational CoP. Existing organizational programs such as the Foreign Service National (FSN) fellowship, as well as helping staff to develop professionally, could also be leveraged to strengthen CoPs in the organization as they give opportunities for staff at previously disjointed periphery sites to connect with more people and start sharing knowledge more widely.

The organization can also improve the knowledge management policies to ensure employee engagement through CoP efforts; when staff is using their own time to participate in CoP, it's important for there to be minimal obstacles to their participation if the communities are to be successful in the organization. Whilst face-to-face interaction is not always possible for CoP in a global organization such as AIDORG, the organization needs to be willing to sponsor activities which would allow CoP members to meet periodically for some face-to-face interaction.

Generally the organization has been moving away from conferences and towards video and teleconferencing, and this could be working against increasing knowledge management system that is available through CoP. Whilst virtual tools and problem solving conference calls are good for CoP, there is always the challenge of the available tools not being consistently used for the knowledge management processes. Annual face-to-face meetings that let CoP members participate in working sessions could further strengthen the organization's knowledge management systems effectiveness by building awareness of and trust in colleagues' expertise.

Inter-organizational collaboration has also been gaining ground in recent years as the organization struggles to keep up with the rapid changes in technology and the diversity of information and knowledge required in making decisions. For AIDORG, inter-organizational collaboration mainly involves learning from development partners and developing expertise which is not available within the organization, for example the Global Development Lab program brings specialists from universities and other technology giants to work with the organization to develop new solutions.

According to LaPorte (2002:5), the World Bank “redefined its purpose to encompass establishing and maintaining a network of collaborative relationships motivated by knowledge sharing”; using CoP among other programs, AIDORG can set up structures to organize, capture and make available the knowledge of staff and development partners. However, a culture of trust and openness between organizations is needed if meaningful knowledge is to be exchanged, and this requires investments in time and effort. At Ford Motor Company, CoPs were also used as a strategy to increase efficiency by identifying, validating, documenting and sharing proven best practices (Kwiecien et al, 2001); another model which could be used to strengthen the knowledge flows at AIDORG.

Whilst retirement and turnover cannot be avoided, AIDORG could also include retired staff in its CoP to avoid losing strategically valuable knowledge, as well as to demonstrate the organization’s commitment to staff. Whilst including internal community members with the expertise for the CoP domain does stimulate knowledge exchange and combination, the inclusion of retired staff would further strengthen these processes and improve the organization’s KM efforts.

AIDORG could also utilize Newell et al (2001)’s empirical study about boundary-less organization by allowing teams that would not normally work together to form a CoP, and benefit from each other’s expertise when they are working on a project that involves both teams. This would allow the organization to provide an essential context and benefit from constructing and reconstructing organizational boundaries. In addition to making both teams’ work more effective, this would develop capabilities which are critical to the continuing success of the organization by building both communities and their shared practices.

6.4 Management Support for CoP Success at AIDORG

Whilst CoP are key to the challenges of the knowledge economy, they do require specific managerial efforts to be developed and integrated into the organization before their full power can be leveraged. Different approaches of formal commitment to CoP AIDORG's senior management can be effective when they are aligned with the organizational culture. Wenger et al (2000) highlights two different management support approaches which both resulted in CoP success at other center-periphery organizations. At American Management System (AMS), CoP membership is a privilege and CoP member participation is paid for by business units; including attending workshops and an annual conference that brings together all the CoPs in the organization. At the World Bank, CoP receive funding, manage their own budgets and participation is voluntary; the organization relies primarily on the intrinsic benefits of CoP membership to drive participation. However at both organizations, senior management boards sponsor communities and there are knowledge managers who assist the CoP (Wenger et al, 2000); AIDORG could adopt one of these approaches to strengthen the organization's COP and overall organizational KMS effectiveness.

Cultural values, work practices, human resource policies, technologies and formal organizational structures could disrupt CoP success if not addressed. It is the role of management to ensure that these are supporting the organization's CoP, and where they are not, ensure that they are revised to do so. Other CoP obstacles which management could address in the organization include changing IT systems that do not serve the CoP, changing promotion systems that overlook CoP contributions, as well as changing policies which reward structures that discourage collaboration in the organization.

Management also needs to allow the communities to share knowledge easily by finding ways to communicate the norms, culture, and language of the community to the organization (Lesser & Storck, 2001). Some of the management interventions which could further strengthen CoPs include management providing opportunities for individuals to make new connections by sponsoring more events where individuals can meet face-to-face with others who are doing similar work, and providing the CoP with tools and technologies that support collaboration and expertise locations, so that members can make connections outside in-person events.

6.5 COP Challenges for center-periphery organizations

Amongst some of the issues confronted by geographically dispersed CoPs, distance makes it difficult for people to connect, and large membership size makes it hard for people to know each other (Chua, 2002). According to Lesser et al (2001:832), “there is nothing in the classical sociological definition of CoP that rules out communication media such as e-mail, discussion groups and chat rooms as support mechanisms for participation in a distributed CoP”. CoPs are therefore increasingly moving from face-to-face exchanges to interactions in an online environment, shared web spaces, email lists, discussion forums and chats; however these environments needs significant financial and technological resources and organizations need to invest in these resources in order to fully support CoPs. Some of the major costs associated with CoPs also include costs of participation time by the members, expenses for meetings and conferences, and publishing costs (Millen et al, 2002).

Some of the CoP challenges which center-periphery organizations such as AIDORG need to be aware of include; the community becoming overly zealous in guarding the CoP domain leading to imperialistic perspectives, members bonding too tightly resulting in egalitarianism, rigid conformance to the group leading to mediocrity, and members developing an overly strong sense of competence leading to dogmatism. CoP would also fail when there is “too much technology, not enough process or people” (Gongla & Rizzuto, 2001:857); which happens when the organization invests a lot in technology but not enough resources to each out and bring new members or establish new processes. This is also likely to happen when there are no processes to incorporate new members and the CoP is being sustained with just a small group, which eventually becomes overwhelmed with the demands of the CoP.

6.6 Conclusion

The conclusion of the research is that since the periphery is where the organization’s practices are embedded, a knowledge management approach with a practice perspective could encourage fuller and more rounded periphery participation in knowledge management and might lead to the desired two way interaction between center and periphery. Therefore, the notion of communities of practice is identified as a possible starting point for redressing the balance in center-periphery knowledge management landscapes. The connections between the CoP members constitute information channels that reduce the amount of time and investment required to gather information, allowing relationships to be formed, and trust to be established to such an extent that meaningful tacit knowledge can be exchanged as the CoP members

share their experiences and knowledge in free-flowing and creative ways. CoP opportunities and challenges, and the role of management in making them effective in a center-periphery organization were also discussed. Even for those organizations which are described as the best, it's essential to continually strengthen coordination with stakeholders in order to tap on the group genius that generates breakthrough innovation.

LIST OF REFERENCES

- Akhavan, P., Jafari, M., and Fathian, M. (2005), 'Exploring Failure-Factors of Implementing Knowledge Management Systems in Organizations', *Journal of Knowledge Management Practice*, vol. 6, May, pp. 1-8
- Alavi, M & Leidner, DE, 1999, Knowledge management systems: Issues, challenges and benefits, *Communications of AIS*, pages 1-37
- Alavi. M & Leidner. D, 2001, Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues, *MIS Quarterly*, 25(1), 107-136
- Armbrecht, F.M.R., Chapas, R.B., Chappelow, C.C., Farris, G.F., Friga, P.N., Hartz, C.A., McIlvaine, M.E., Postle, S.R. and Whitwell, G. E., 2001, Knowledge Management in Research and Development, *Research Technology Management*, July/August, p 28 – 48.
- Atwood, M.E., 2002, Organizational Memory Systems: Challenges for Information Technology, *Conference Proceedings, 35th Annual Hawaii International Conference on System Sciences*
- Becerra-Fernandez, I. and Sabherwal, R., 2010, Knowledge Management: Systems and Processes. Armonk (N.Y.); London: M.E. Sharpe.
- Benjamin, R., & Fensel, D, 1998, The ontological engineering initiative-ka2. In Proceedings of the *1st International Conference on Formal Ontologies in Information Systems*
- Biygautane, M and Al-Yahya, K., 2011, Knowledge Management in the UAE's Public Sector: The Case of Dubai. Dubai School of Government, paper presented at the *Gulf Research Meeting Conference* at the University of Cambridge, UK.
- Boland and Tenkasi, Perspective Making and Perspective Taking in Communities of Knowing, *Organization Science*, 1995, 6(4), pp.350-372
- Botha A, Kourie D, & Snyman R., 2008, Coping with Continuous Change in the Business Environment, *Knowledge Management and Knowledge Management Technology*, Chandice Publishing Ltd.
- Bowker, G., & Star, S., 1999, Sorting things out: Classification and its consequences, Cambridge, MA: MIT Press.
- Brown, J.S. & Duguid, P., 1998, Organizing Knowledge, *California Management Review* 40(3)
- Brown, J., & Duguid, P., 1991, Organizational learning and communities-of practice: Toward a unified view of working, learning and innovation. *Organization Science*, 2(1), 40-57.
- Chaffey, D. and Wood, S., 2005. Business Information Management: Improving Performance using Information Systems. Harlow: Pearson Education Limited.
- Child, J., 1972, Organizational structure, environment and performance: The role of strategic choice. *Sociology* 6: 1-22.
- Chua A, Book Review, Cultivating Communities of Practice: A guide to Managing Knowledge, *Journal of Knowledge Management Practice*, 2002, page 4

- Davenport, T., De Long, D., and Beer, M.C., 1998, Successful knowledge management projects, *Sloan Management Review*, 39 (2), pp. 43-57.
- Davenport & Prusak, 1998, Working Knowledge: How Organizations Manage What They Know, accessed in March 2016, http://www.kushima.org/is/wp-content/uploads/2013/09/Davenport_know.pdf
- Daft, R. and Lengel, R., 1986, Organizational Information Requirements, Media Richness And Structural Design, *Management Science* 32 (5), 554-571
- Denning, S, 2000, The Springboard: How Storytelling Ignites Action in Knowledge-Era, page 30
- Disterer, G., 2001, Individual and Social Barriers to Knowledge Transfer' in Weber., R, 2007, Knowledge Management in Call Centres, *The Electronic Journal of Knowledge Management*, 5(3), pp 333 - 346, available online at www.ejkm.com
- Dyer, Greg and Brian McDonough., 2001, The State of KM, *Knowledge Management*, (4):5. pp. 31-36
- El Sawy & Majchrzak, 2004, Critical issues in research on real-time knowledge management in enterprises, *Journal of Knowledge Management*, 8(4), page 21 - 37
- Gamble, P.R., & Blackwell, J. (2001), Knowledge Management: A State of the Art Guide, Kogan Page Ltd
- Granovetter, M., 1973, The Strength of Weak Ties, *American Journal of Sociology*, 78 (6), 1360 – 1380.
- Grant. M., 1996, Toward A Knowledge-Based Theory Of The Firm, *Strategic Management Journal*, 17(2), 109 – 122
- Grasic, B and Podgorelec., V, 2011, Developing knowledge management systems: approaches, technologies and methods, *Applications of Mathematics and Computer Engineering*, page 207-212, <http://www.wseas.us/e-library/conferences/2011/Mexico/CEMATH/CEMATH-34.pdf>
- Gongla P & Rizzuto R, Evolving communities of practice: IBM Global Services experience, *IBM Systems Journal*, 40 (4), 2001, page 842
- Grasic, B & Podgorelec, V., 2011, Developing knowledge management systems: approaches, technologies and methods, *Proceedings of the 2011 American conference on applied mathematics and the 5th WSEAS international conference on Computer engineering and applications*, pp.207-212
- Hahn, J. and Subramani, M. R., 2000, A Framework of Knowledge Management Systems: Issues and Challenges for Theory and Practice, *Proceedings of the 21st International Conference on Information Systems*, pp. 302-312
- Hansen, M., Nohria, N, & Tierney, T, 1999, What's Your Strategy for Managing Knowledge?, *Harvard Business Review*, 77(2)
- Hendriks, P., 2003, Assessing The Role Of Culture In Knowledge Sharing
- Hecht, M., Maier, R., Seeber, I., and Waldhart, G., 2011, Fostering adoption, acceptance, and assimilation in knowledge management system design, *Proceedings of the 11th International Conference on Knowledge Management and Knowledge Technologies*

- Hinton, B., 2003, Knowledge Management and Communities of Practice: an experience from Rabobank Australia and New Zealand, *International Food and Agribusiness Management Review* 5(3)
- Jensen, M. and Meckling. W., 1996, 'Divisional Performance Measurement,' available online http://papers.ssrn.com/sol3/papers.cfm?abstract_id=94109
- Jubert, A. (1999). Developing an infrastructure for communities of practice. In B. McKenna (Ed.), *Proceedings of the 19th International Online Meeting*, 165-168. Hinksey Hill, U.K.: Learned Information.
- Keen, P. G. W., 1991, Relevance and rigor in information systems research: Improving quality, confidence, cohesion and impact in information systems research. *Contemporary Approaches and Emergent Traditions*, pp. 27-49. Elsevier Science Publishers.
- King, W., 2005, "Ensuring ERP Implementation Success", *Information Systems Management*, Summer, 83-84
- King, W.R., P. Marks, and S. McCoy., 2002, The most important issues in knowledge management. *Communications of the ACM* 45(9), 93-97.
- Kofman, F. & Senge, P., Communities of Commitment: The Heart of Learning Organizations, *Organizational Dynamics*, 22 (2), 5- 22
- Kwiecien et al, 2001, Gaining real value through best-practice replication, *Knowledge Management Review*, 4(1)
- Lee, T., 1998, *Using Qualitative Methods in Organizational Research*. Thousand Oaks, CA: Sage
- Leedy, P., & Ormond, J., 2001, *Practical Research: Planning and design*, 7th ed.
- Lesser, E., and Everest, K., 2001, 'Using Communities of Practice to Manage Intellectual Capital, *Ivey Business Journal*, March/April, 37-41
- Lesser, E & Storck J, Communities of practice and organizational performance, *IBM Systems Journal* 40(4), 2001.
- Malhotra, Y., 2004, Why Knowledge Management Systems Fail? Enablers and Constraints of Knowledge Management in Human Enterprises, <http://www.brint.org/WhyKMSFail.pdf>
- McDermott, R., 2004, How to avoid a mid-life crisis in your COPs: Uncovering six keys to sustaining communities, *Knowledge Management Review* 4(2), 10-13
- McDermott, R., 1999, How to build communities of practice in team organizations, *Knowledge Management Review*, 8, 32-36.
- McDermott, R., Why information technology inspired but cannot deliver knowledge management, *California Management Review*, 1999, 41 (4)
- Meso, P, & Smith, R, 2000, A resource-based view of organizational knowledge management systems, *Journal of Knowledge Management*, 4(3), pp.224 - 234
- Millen D, Fontaine M, & Muller M, Understanding the Benefit and Costs of Communities of Practice, *Communications of the ACM*, April 2002, 45 (2), page 71

- Minbaeva, D., Pedersen, T., Björkman, I., Fey, C. F., & Park, H. J., 2003, MNC knowledge transfer, subsidiary absorptive capacity, and HRM. *Journal of International Business Studies*, 34(6), 586-599.
- Mintzberg, H., 1980, Structure in 5's: A Synthesis of the Research on Organization Design, *Management Science*, 26 (3), 322-341
- Monaham & Fisher (2010) in Saunders M, Lewis P, Thornhill A, 2012, Research Methods for Business Students
- Nahapiet, J. and Ghoshal, S., 1998, Social Capital, Intellectual Capital, and the Organizational Advantage, *Academy of Management Review*, 23(2), 242-66.
- Newell, S., Robertson, M., Scarbrough, H. & Swan, J., 2002, Managing Knowledge Work, Palgrave, Basingstoke, Hampshire.
- Newell, S., M. Robertson, H. Scarbrough and J. Swan., 2009, Managing knowledge work and innovation. London: Palgrave Macmillan.
- Nielsen, B. B., & Michailova, S., 2007, Knowledge management systems in multinational corporations: Typology and transitional dynamics, *Long Range Planning*, 40(3), page 314-340
- Nonaka, I. 1994. A dynamic theory of organizational knowledge creation. *Organizational Science* 5(1), 14–37.
- Nonaka, I. and Takeuchi, H., 1995, The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation. New York: Oxford University Press.
- O'Dell, C., and C.J. Grayson., 1998, If only we knew what we know: identification and transfer of internal best practices. *California Management Review* 40(3), 154–174
- Probst, G., and Borzillo, S., 2008, Why communities of practice succeed and why they fail, *European Management Journal*, 26, 335– 347
- Robertson, J., 2007, There are no "KM systems", Step Two Designs, http://www.steptwo.com.au/papers/cmb_kmsystems/index.html
- Robertson, M. and Swan, J., 2004, Going public: the emergence and effects of soft bureaucracy within a knowledge-intensive firm, *Organization*, 11 (1), 123-148
- Ruggles, R., 1998, The state of the notion: Knowledge management in practice. *California Management Review*, 40(3), 80-89.
- Samitt, M. K., 1999, Knowledge management in a corporate environment: An annotated bibliography. *Business and Finance Bulletin*, 210, 39-50.
- Saunders M, Lewis P, & Thornhill A, 2012, Research Methods for Business Students
- Scarbrough, H. and Swan, J., Explaining the diffusion of knowledge management: The role of fashion, *British Journal of Management*, 2001, 12, 3-12.
- Schein, E. H., Organizational Culture and Leadership, 3rd Edition, The Jossey-Bass Business & Management Series
- Storck, J. and Hill, P. A., 2000, Managing Global Infrastructure: A Strategic Community Builds Strategic Capabilities. *Sloan Management Review*, 41(2), 63-74.
- Swan, J., 2008, Knowledge, In International Encyclopedia of organization studies, S. Clagg and J. R. Baily eds., 750-755. Thousand Oaks: Sage Publications. Cited in Newell et al. 2009

- Szulanski, G., 1996, Exploring Internal Stickiness: Impediments To The Transfer Of Best Practice Within The Firm, *Strategic Management Journal*, 17(2), 27 – 43
- Tapscott, Don, 1999, Creating value in the network economy, Boston: *Harvard Business Review*.
- Tsai. W and Ghoshal. S, 1998, Social Capital and Value Creation: The Role of Intrafirm Networks, *The Academy of Management Journal*, 41(4), 464-476
- Thompson, M., 2005, Structural and Epistemic Parameters in Communities of Practice, *Organization Science*, 16(2), 151–164.
- Thomas, J., Kellogg, W., and Erickson, T., 2001, The knowledge management puzzle: Human and social factors in knowledge management, *IBM systems Journal*, 40 (4), 863
- Tsoukas, H., 1996, The firm as a distributed knowledge system: A constructionist approach. *Strategic Management Journal* 17 (special issue), 11-25.
- Tsoukas, H., 2003, Do we really understand tacit knowledge, In *The Blackwell Handbook of Organizational Learning and Knowledge Management*, edited by M. Easterby-Smith and M.A. Lyles, 411-427. Oxford: Blackwell Publishing
- Weber., R, 2007, Knowledge Management in Call Centres, *The Electronic Journal of Knowledge Management*, 5(3), pp 333 - 346, available online at www.ejkm.com
- Wenger, E.C., 2000, Communities of Practice and Social Learning Systems, *Organization*, 7 (2), 225-246.
- Wenger et al, 2002, p.4 in Elliot W & Finsel C, Communities of Practice, *National Congress of American Indians Policy Research Center*.
- Wenger, E. C. and W. M. Snyder., 2000, Communities of practice: The Organizational Frontier. *Harvard Business Review*, 78 (1), 139-145.
- Wenger E, McDermott R, Snyder W, *Cultivating Communities of Practice: A guide to Managing Knowledge*, Harvard Business School Press, Boston, 2002
- Wesley, A., 1998, The Boundary less Organization, *Business Change and Re-engineering*, 3(2), 84–88
- Wickramasinghe, N., 2003, Do we practice what we preach: are knowledge management systems in practice truly reflective of knowledge management systems in theory?, *Business Process Management Journal*, 9(3), 295–316.
- Woodman. M, and Zade., A, 2012, Five Grounded Principles for Developing Knowledge Management Systems, *Electronic Journal of Knowledge Management*, 10 (2), 183-194, available at www.ejkm.com
- Zheng, Y., Li, L. and Zheng, F., 2010, Social Media Support for Knowledge Management, *Knowledge Creation Diffusion Utilization*, 9-12

APPENDIX A - QUESTIONNAIRE

PURPOSE

The purpose of the research is to analyze the effectiveness of knowledge management systems (KMS) in organizations with a center-periphery landscape, using AIDORG as a case study. An organization with a center-periphery landscape has authority, resources and development more concentrated at the center than at the field offices level. The analysis will focus on the effectiveness of KMS within such a landscape, as well as what could be done to further strengthen the existing KMS. Criteria such as system usage, usefulness, and productivity will be used to assess the KMS effectiveness.

GENERAL

Knowledge management systems refer to any information technology system that captures, stores and retrieves knowledge, and improves collaboration. Examples include e-mail, intranet, databases, Google Drive, websites, public drives.

1. Please select your office: Finance Administration and Support
 General Services Technical Offices Other
2. How many years have you worked at this organization: 0 to 3 4 to 7 8 to 10
 11 to 15 16 to 20 21 to 30
3. Have you ever working at AIDORG/Washington, including TDY or FSN
 Fellowship? Yes No
4. How familiar are you with the term Knowledge Management System?
 Very Good Reasonable Slight No familiarity

KMS Usage

1. How often do you use the organization's knowledge management systems, for example MyAIDORG, to capture/store new knowledge?

- Always Very often Sometimes Rarely Never

2. How often do you use the organization’s knowledge management systems to find/discover knowledge?

- Always Very often Sometimes Rarely Never

3. How often do you use the organization’s knowledge management systems to share knowledge?

- Always Very often Sometimes Rarely Never

4. Where do you normally store/capture new knowledge? Tick all that apply.

- Network drive Google Drive My Computer MyAIDORG
 Huddle Email Notebook

5. How often do you use each of the resources below to find work-related knowledge?

(Select one for each row)?

	0-20%	21-40%	41-60%	61-80%	81-100%
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MyAIDORG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Email AIDORG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Google Chat with colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Call colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Printed documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Automated Directives System (ADS)/General	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

KMS Usefulness

1. How would you describe the amount of knowledge in the KMS we have presently at AIDORG?

- Far too much Too much, About right
 Too little Far too little

2. On a scale of 1-5, how would you rank the importance of each of the following in any KMS? (*1 represents the most important and 5 the least important*)

	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accesibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Search function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collaborative features	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. On a scale of 1-5, which of the following does the AIDORG KMS need the most for it to be more effective than what it is. (*1 represents the most needed and 5 the least needed*)

	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accesibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Search function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collaborative features	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Besides the AIDORG KMS, how useful have you found the following to be useful for sharing or discovering knowledge? (1 is the most useful and 5 the least useful)

	1	2	3	4	5
AIDORG Conference s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Retreats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FSN Fellowship at AIDORG/W	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TDY at other Missions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inter-office meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Partners meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General discussions with team mates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General discussions during lunch with other colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Organizational Productivity

1. *‘KMS are helping the organization to accomplish its objectives by providing timely information, stimulation of more interaction, and better decision making.’* What is your opinion?

- Strongly agree Mildly agree Neither agree or disagree
 Mildly disagree Strongly disagree

2. *‘KMS are helping me and my team to accomplish more work than before and have increased my job satisfaction?’* What is your opinion?

- Strongly agree Mildly agree Neither agree or
 Mildly disagree Strongly disagree

3. How often do you see knowledge that has been shared or developed at a Mission being shared with the whole AIDORG organization, for example, via e-mail, MyAIDORG, Frontlines, conferences, etc?

- Always Frequently Sometimes Rarely Never

4. How often do you see new knowledge that was developed at AIDORG/W being shared with the whole AIDORG organization, for example, via e-mail, MyAIDORG, Frontlines, conferences, etc?

- Always Frequently Sometimes Rarely Never

5. In your opinion, how would improvements in the following areas affect KMS effectiveness at AIDORG?

	To a large extent	To some extent	To a small extent	Not at all	Uncertain
Technological advancements at the Missions (equipment, bandwidth)					
More training and awareness programs for staff					
Increased user involvement in during KMS development					
More senior leadership involvement during and after KMS launch					

An analysis of the Knowledge Management Systems in an organization with a center-periphery knowledge management landscape

Introduction of incentives and knowledge champions					
Collaborative capabilities with AIDORG partners and					
Standardized exit briefings and newcomers orientation					