



**ADDIS ABABA UNIVERSITY COLLEGE OF NATURAL AND COMPUTATIONAL
SCIENCES SCHOOL OF INFORMATION SCIENCE**

**FACTORS AFFECTING UNIVERSITY-INDUSTRY KNOWLEDGE SHARING
PRACTICES: THE CASE OF ADDIS ABABA UNIVERSITY COLLEGE OF
VETERINARY MEDICINE**

BY

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Addis Ababa, Ethiopia



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Declaration

This thesis has not previously been accepted for any degree and is not being concurrently submitted in candidature for any degree in any university.

I declare that the thesis is a result of my own investigation, except where otherwise stated. I have undertaken the study independently with the guidance and support of my research advisor. Other sources are acknowledged by citations giving explicit references. A list of references is appended.

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Fikru Minwalkulet

This thesis has been submitted for examination with my approval as university advisor.

Advisor's Signature: _____

Temtim Assefa (PhD)

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Acronms

AAU	Addis Ababa University
AAUCVM	Addis Ababa University College of Veterinary Medicine
CVM	College of Veterinary Medicine
DVM	Doctor of Veterinary Medicine
ICT	Information Communication Technology
IT	Information Technology
KM	Knowledge Management
KMS	Knowledge Management System
KS	Knowledge Sharing
PhD	Doctor of Philosophy
R&D	Research and Development
SECI	Socialization, externalization, Combination, and Internalization
SPSS	Statistical Package for Social Science
UK	United Kingdome
VLT	Veterinary Laboratory Technology

Abstract

Knowledge becomes a valuable resource and asset for organizations today that brings competitive advantage if it is created, acquired, shared and applied properly. Knowledge sharing is a process that may take place across individuals as well as groups, departments and organizations to bring organizational competitiveness. Although knowledge sharing has significant importance for organizational competitiveness, the knowledge sharing process might be very complex due to different factors. Thus, the purpose of this study was to identify how knowledge is shared between college of veterinary medicine and stakeholder industry and to explore factors that affect university-industry knowledge sharing practices taking Addis Ababa University College of Veterinary Medicine as a specific case. The study applied cross sectional mixed research approach. Simple random sampling and purposive sampling was applied to select sample questionnaire survey and interview respondents respectively. As a result, from a total population of 80 academic staff in the college, 66 respondents were selected based on Krejcie and Morgan (1970) sample determination table. Accordingly, 66 survey questionnaires were distributed and 65 questionnaires were appropriately filled and returned. Hence, the analysis of the data was made based on the 65 returned questionnaires by using descriptive statistics such as frequency, percentage, mean and standard deviation as well as regression analysis and correlation coefficient. The result of the study revealed that joint publications, training company employees, contract research, joint research and participating in professional membership are the top five KS practices AAUCVM academicians often used to interact with stakeholder industry. Moreover, individual factors (willingness, trust, motivation to share knowledge and awareness of KS as duties); organizational factors (providing promotion for sharing knowledge and existence of knowledge sharing policy); and technological factors (availability of up-to-date ICT infrastructure and updated website for sharing knowledge) were identified as having significant impact on knowledge sharing practices.

Keywords: Knowledge sharing practice, knowledge sharing mechanism, and university-industry KS

CHAPTER ONE: INTRODUCTION

1. Background of the Study

Knowledge is among the most important strategic resource in organizations today. Knowledge, according to Nakkiran & David (2003) as cited in Mindahun (2016), is the primary commodity and most important in the economy. Managing knowledge is important in academic as well as in the business and industrial community due to its importance to maintain their competitiveness. As a result, knowledge management help organizations to acquire, create, refine, store, transfer, share and utilize knowledge (King, 2009).

Knowledge becomes a valuable resource and asset for organizations that brings competitive advantage if it is created, acquired, shared and applied properly. The key reason for the existence of organizations (either business or academic world) is knowledge it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms. Unless it is shared with friends, staff, and the community at large, it will not be useful (Cheng, Ho, & Lau, 2009). Knowledge sharing, according to Temtim (2014), is a key activity in the organization that promotes conversion of individual knowledge into organizational knowledge where it can be used to create business value.

According to Becera-Fernandez and Sabherwal (2010), knowledge sharing is a process that may take place across individuals as well as groups, departments and organizations. Knowledge sharing, according to these authors, is also explained as an important process in enhancing organizational innovativeness and performance. Solek-Borowska (2015) also described knowledge sharing as “exchanging experiences, thoughts or understandings with an expectation of gaining further knowledge.” Knowledge sharing, according to this author, takes place at least between two parties or actors.

Knowledge sharing occurs when an individual in organizations is willing to assist as well as to learn from others in the development of new competencies (Solek-Borowska, 2015). According to this author, knowledge sharing in knowledge intensive organizations such as universities is more desirable and an important factor in organizational success. Szulanski (1996) as cited in Mindahun (2016) explained organizational knowledge is “contingent upon the firm’s ability to institutionalize individual-based knowledge with the intention of making it available to other organizational members.” In this regard, universities and other organizations are expected to strategically collaborate with the aim of exchanging knowledge to increase competitiveness. As key drivers of innovation and major agents of economic growth, universities are viewed by many policy makers as “knowledge factories” with largely untapped reservoirs of potentially commercializable knowledge (Wolfe and Bramwell, 2008; cited in Solek-Borowska, 2015).

According to Solek-Borowska (2015) scenario on “how universities share knowledge”, universities generate knowledge and new technologies along with an innovative culture. This author further explained knowledge as the primary “product” that can be “sold” in the form of educational services, research results, and expertise. Consequently, sharing knowledge is essential for knowledge-based organizations wanting to compete effectively in the wider market place and the pressure in this from the public and industry is becoming stronger (Steyn, 2004; Hendzel, 2005; cited in Solek-Borowska, 2015). Furthermore, the role of universities is not limited to provide knowledge to students; rather universities seek more contact with industry to commercialize research outputs, access complementary skills, and profit from interactive learning process. Firms, on the other hand, recognize universities as important source of knowledge that enhances competitiveness and innovation (Solek-Borowska, 2015).

When organizations implement knowledge creation and sharing strategy with collaborative endeavor its competitive advantage have been continued (Yadav & Shrivastava, 2015). In this regard, College of Veterinary Medicine have benefitted by sharing knowledge with stakeholder organizations, which enables to increase its effectiveness and efficiency in

terms of achieving the teaching-learning, research and community service objectives. As a result, this research was intended to explore the knowledge sharing practices and factors affecting knowledge sharing practices of Addis Ababa University College of Veterinary Medicine with stakeholder industries.

2. Statement of the Problem and Justification

Studies have been conducted previously on knowledge sharing practices of academic institutions which might be equally important for university-industry knowledge sharing practices. For instance, a case study research conducted in Malaysian public higher learning Institutes revealed that rewards, availability of time, organizational effort, organizational culture and lack of interaction as the five most important barriers for knowledge sharing (Jain, 2007). Moreover, a research conducted on knowledge sharing in Jordanian Universities revealed that “academic staff have fewer mutual relationships, team working opportunities, intentions and motivations to share their knowledge” and younger staff are not motivated to be “creative” (Alhammad, Faori, & Husan, 2009). Basu and Sengupta (2007) also identify “integrated technical infrastructure, organizational culture, motivation and commitment of users and senior management support” as the four most critical success factors in their study conducted in the Indian Business School.

Cao and Zhang (2011) cited in Mindahun (2016) considered inter-organizational knowledge sharing as the strategic means in attaining competitive advantage in fast changing business environment. In relation to university and industry knowledge sharing practices, Gulenc and Araci (n.d) states that due to the reason that firms do not have all knowledge in their internal sources, they need to take up external knowledge sources to reduce risk and environmental uncertainties. In this regard, the existence of knowledge in different forms such as explicit and tacit knowledge demands different mechanism for university and industry to share knowledge with each other. Hence, plenary meetings, workshops, panel debates, inter-organizational group meetings, peer-review, joint research projects, internship experience, best practices, and many others are found important to share knowledge between university and industry (Chen *et al*, 2017; Rast *et al*, 2012).

In Ethiopian context, there are researches conducted by different authors. Some researches are on Banking industry (see Temtim, 2014; and Habtamu, 2011), for instance. Some others are on health sectors (see Amezenech, 2014; Betelehem, 2017; Gizew, 2017; Tirualem, 2011; Mulusew, 2014; and Teklit, 2014). There are also other researches conducted on academic institutions (see Elizabeth, 2015; Rahel & Ermias 2011; and Biruk, 2014). For instance a preliminary research conducted by Rahel and Ermias (2011) on “prospects of knowledge sharing among Ethiopian institutions of higher learning” revealed that the status of knowledge sharing practices in relation to personal, technical, organizational factors and availability of infrastructure. These authors in their research also suggest that organizing annual forums for academic symposium, problem solving sessions, workshops and conferences for interaction, communities of practice, IT platforms that enable to share repositories, staff exchange programs as strategies and mechanisms of knowledge sharing among others.

However, there is no research undertaken on knowledge sharing practices on university-industry in the specific context of Addis Ababa University College of Veterinary Medicine. Moreover, though there are researches conducted in the area, the research result can differ due to contextual factors (Abdul-Cader, 2015; Temtim, 2014; Elizabeth, 2015; Abdul-Jalal, 2013). It is also important to study the knowledge sharing practices in a specific context and to extend generalizations of existing findings to different contexts. Hence, this study focused on examine the existing university-industry knowledge sharing practices of College of Veterinary Medicine taking the specific institutional context in to consideration. To this end, this study attempted to answer the following basic research questions:

1. How knowledge is shared between Addis Ababa University College of Veterinary Medicine and stakeholder industry?
2. What are the most important factors that affect knowledge sharing practices between Addis Ababa University College of Veterinary Medicine and stakeholder industry?

3. Objectives of the Study

3.1. General Objective

The general objective of this study is to examine factors affecting knowledge sharing practices between Addis Ababa University College of Veterinary Medicine and stakeholder industry.

3.2. Specific Objectives

To achieve the main objective, the study has the following specific objectives:

1. To explore knowledge sharing mechanisms between Addis Ababa University College of veterinary medicine and stakeholder industry.
2. To identify the most important factors that affect knowledge sharing practices of Addis Ababa University College of Veterinary Medicine and stakeholder industry.

4. Significance of the study

This study is intended to examine the existing knowledge sharing practices and its associated factors that affect KS practices between Addis Ababa University College of veterinary medicine and stakeholder industry. The study may add up its contribution to the existing knowledge in the area and will give an insight to researchers who will be interested to study further in the area.

5. Scope of the Study

University-industry knowledge sharing practices can be studied on both university and industry sides. In this study, only university (i.e. Addis Ababa University College of Veterinary Medicine) was chosen as it will need ample time, money and other facilities to study the knowledge sharing practices on both sides exhaustively. The study populations were also limited only to academic staffs of the selected college.

6. Organization of the Paper

This paper is organized in to five chapters. The first chapter deals with the background of the study. The second chapter covers review of the related literatures. The third chapter presents research design and methodology. The fourth chapter is about interpretation and analysis of the data. The fifth chapter presents summary of the findings, conclusions and recommendations of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1. Overview of Knowledge

Knowledge can be described in different forms based on different perspectives. Based on the resource-based perspective, organizations consider knowledge as strategic assets which are important to achieve their organizational objectives (Abbasnejad, Baerz, & Azar, 2011; Ipe, 2003). It is recognized as the most significant resource for competitive advantage (Anatan, 2015; Seyyedeh, Daneshgar, & Aurum, 2009) and the key to enhance innovation (Al-Husseini & Elbeltagi, 2015). Knowledge is also regarded as the principal resource of organizations and has become the most important of a firm's resource (Alexander & Childe, 2012; Cao & Xiang, 2012).

Knowledge, according to Ayodele, Yao, Haron, & Juan (2016), is perceived as the most important resources needed for any knowledge intensive institution for its survival. Temtim (2014) also describe the resource view of knowledge as promoters of the need to boost the existing stock of knowledge through encouraging interaction and creation of knowledge as well as applying it in the business process. Taking the arguments from different previous works, Temtim also explain knowledge “as justified true belief that is acquired through observation and experience and which gives a capability to interpret new information and take appropriate action.” Based on cognitive science perspective, Dalkir (2005) define knowledge as insights, understanding and practical know-how which is the fundamental resource to function intelligently. This author further describes knowledge as a principal factor that makes personal, organizational, and societal intelligent behavior possible.

Reviewing previous literatures, Anteneh and Tibebe (2014) stated knowledge as a source of power for those who possess it at the right time and at the right place and regarded as the factor of production together with land, labor, and capital. By referring the work of Davenport and Prusak, they also presented the definition of knowledge as a “fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information.” Nonaka

(1994) also provides a definition of knowledge as “a justified personal belief that increases an individual’s capacity to take effective action” by considering knowledge from its application perspective. Haque, Ahlan and Razi (2015) also considered knowledge as a very significant components and preliminary resources in the organizations which brought knowledge sharing important in organizations. For the purpose of this study, knowledge refers to the intangible asset of organizations that resides in organizational employees, work procedures, organizational routines, and knowledge artifacts at individual level, group level and organizational level both in tacit and explicit forms.

2.2. Forms of Knowledge

Knowledge is categorized in to different forms in different extant literatures. For instance, by citing the classification that was originally developed by Michael Polanyi, Nonaka (1994) popularized the explicit and tacit classification of knowledge with his interpretation of Polanyi’s work. Explicit knowledge, according to Nonaka (1994), is knowledge that is codified on external objects that is usually contained within tangible or concrete media. Explicit knowledge, as stated by Nonaka, is codified knowledge that can be transmitted into formal and systematic language. It is tangible and can be expressed in words or numbers and shared in the form of data, scientific formulas, specifications, reports and manuals. It is captured in records of past such as libraries, archives and databases.

Dalkir (2005) also describe tacit and explicit knowledge as the two major forms of knowledge classification. Explicit knowledge, according to this author, is codified knowledge expressed in formula, linguistic, words and algorithms and easily transferrable and storable. On the other hand, tacit knowledge is the knowledge that tends to reside within the heads of the knowers which can be difficult to articulate and to put in to words, text and drawings. Moreover, tacit knowledge is not easily expressed in formalized ways and is context-specific, personal and difficult to disseminate or communicate. Hence, explicit knowledge is certainly easier to transfer and to explain than tacit knowledge, since it is often supported by formal conceptual frameworks and accurate language (Rynes, Bartunek, & Daft, 2001).

According to Nonaka and Krogh (2009) tacit knowledge is crucial for any organization and covers knowledge that is unarticulated and tied to the senses, movement skills, physical experiences, intuition, or implicit rules of thumb. He also added that tacit knowledge is technical or cognitive and is made up of mental models, values, beliefs, perceptions, insights and assumptions. Tacit knowledge, according to this author, is practical, action-oriented knowledge or “know-how” based on practice, acquired by personal experience, seldom expressed openly, often resembles intuition. He also described tacit knowledge as a local knowledge that one cannot find it in manuals, books, databases or files. Tacit knowledge differs from explicit knowledge that is expressed and captured in drawings and writing.

As tacit knowledge is difficult to articulate and important to organizations, there are different ways through which tacit knowledge can be transferred from individual to another individual and from individuals to groups. In line with this, Ipe (2003) noted that explicit knowledge is a representation of tacit knowledge in the form of an “artifact” which can be in the form of a document, an image or a video. Ipe (2003) further clarified that knowledge becomes tangible as a digitized content, as a context that can be digitally shared, and through direct and indirect interactions as viewed in a certain context. Explicit knowledge, as stated by Govind & Kuttim (2016), means published research findings which are codified, formulated and available; but there is tacit knowledge related to skills and experiences that can only be obtained by face-to-face contacts. Though explicit-tacit form of knowledge classification is widely cited in extant literature, there exists other classification of knowledge. For instance, Nonaka (1994), categorize knowledge as individual, group and organizational knowledge based on the location where the knowledge is found.

Individual knowledge is defined by Lam (2000), cited by Ipe (2003), as “part of an organization’s knowledge which resides in the brains and bodily skills of the individual.” Nonaka (1994) also argued that individual knowledge is tacit knowledge embedded in the minds of individuals and explicit knowledge privately owned by individuals. Nonaka

further argued that organizations by itself cannot create knowledge without individuals; rather it is the individuals in organization that create and possess knowledge for the organization. The author further stress that unless the knowledge created and possessed by individuals in organizations is shared with other individuals and groups, it is likely to have limited impact on organizational effectiveness. Bhatt (2002) also noted that individual knowledge is often expressed through personal creativity and self-expression created through interaction between individuals at various levels in the organization. Moreover, Bhatt argued that individual knowledge and organization knowledge are distinct, but interdependent. According to this author, individual knowledge is often expressed through personal creativity and self-expression.

According to Tsoukas & Vladimirou (2001), organizational knowledge is defined as “the capability members of an organization have developed to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting sets of generalizations (propositional statements) whose application depends on historically evolved collective understanding and experiences.” Organizational knowledge, according to Jones and Leonard (2009), is defined as the collection of knowledge which exists in the organization that has been derived from current and past employees. Ipe (2003) also describe organizational knowledge as knowledge of individuals or groups institutionalized as organizational procedures, rules and policies. Hence, organizational knowledge is knowledge collected from different sources such as individuals, subunits or groups.

2.3. Knowledge Sharing

Knowledge sharing is one of the most important components in knowledge management process (Hermans and Castiaux 2007; Alavi and Leidner, 2001; Berends, 2003; Dalkir, 2005; Jain, 2007). It is part of the broader field of Knowledge Management (KM) encompassing how organizations create, process, retain, share and make the best use of knowledge (Uriarte, 2008). Dalkir (2005) also considered knowledge sharing as a crucial process within organizational setting and as a vital means for achieving collective outcomes as part of the work requirements. Casimir, Lee& Loon (2012) also described knowledge

sharing as a voluntary act that helps contribute an organization's competitive advantage. Knowledge sharing is also described as a process of bridging organizational interdependencies inherent in ongoing organizational activities (Natarajan, 2008). Knowledge sharing, as stated by Kim and Ju (2008), is the process of being aware of knowledge needs and making it available to others via appropriate infrastructure. They also view knowledge sharing as a flow of knowledge from the knowledge holder to the knowledge seeker.

Knowledge sharing, as stated by Muda & Yusof (2014), is a mechanism which can result in the establishment of knowledge repository. Alavi and Leidner (2001) also noted that knowledge sharing is a process of knowledge dissemination to potential knowledge seekers by the knowledge holders. The general concept of knowledge sharing, according to Anteneh and Tibebe (2014), is the process through which knowledge routed between a source and a recipient. They further stated that the objective of any knowledge sharing process is to transfer knowledge from the source to a recipient successfully regardless of organizational role. Ipe (2003) viewed knowledge sharing as effective leverage for making knowledge available to others within organization at individual level. Similarly, Ayodele *et al* (2016) described knowledge sharing as an activity through which knowledge is exchanged among people within an organization.

Knowledge sharing is a process that may take place across individuals as well as groups, departments and organizations (Becera-Fernandez & Sabherwal, 2010). Solek-Borowska (2015) also described knowledge sharing as "exchanging experiences, thoughts or understandings with an expectation of gaining further knowledge." Knowledge sharing, according to this author, takes place at least between two parties or actors. Moreover, Muda & Yusof (2014) described knowledge sharing as an integration of experience, values, information and individual understanding. Knowledge sharing occurs, according to the authors, through the process of exchanging experiences, skills, events and thinking that is agreed by both the sender and receiver. Bulan and Sensuse (2012) also stated knowledge sharing as a process whereby tacit or explicit knowledge is communicated from one

individual to other individuals and it is considered as the best approach for managing knowledge.

According to Nonaka (1994) knowledge sharing is the process that causes conversion of individual knowledge in to explicit knowledge. The process of knowledge sharing is vital for innovation, organizational learning, the development of new skills and capabilities, increase in productivity and maintenance of competitive advantage (Argote & Ingram, 2000). Hence, knowledge sharing has received considerable attention even more than other knowledge management processes (Mueller, 2015). According to Haque *et al* (2015) knowledge sharing is a very significant components and preliminary resources in the organizations. For the purpose of this stud, knowledge sharing refers to exchange or transfer of knowledge that resides in individuals, groups and organizations to other individuals, groups and organizations.

2.4. Knowledge Sharing Model

Nonaka (1994) developed SECI model based on the interaction between explicit and tacit knowledge to create new knowledge through the process of what he termed as knowledge conversion. The SECI model which was developed by Nonaka originally for the purpose of knowledge creation and later used to study knowledge sharing includes the four modes of knowledge conversion: socialization, externalization, codification and internalization (SECI). This model has been described in knowledge management literature as one of the best known and most influential model (Wei, Jin, & Yaqi, 2011).

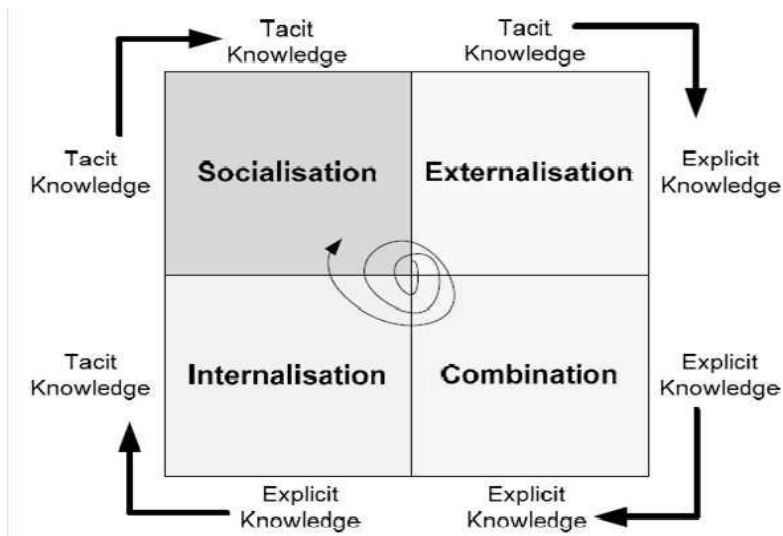


Figure 1: Models of Knowledge Sharing (Nonaka, 1994)

Socialization (tacit to tacit knowledge) is the process of knowledge sharing through collaboration and communication (Nassuora, 2011). It is a process of sharing tacit knowledge without the use of language (Nonaka 1994). It occurs when tacit knowledge is formed through shared experience between individuals (Nonaka & Konno, 1998). It is a process of converting new tacit knowledge, as stated by Nonaka & Toyama (2003), through shared experience in day-to-day interaction. Kharabsheh (2007) also described socialization as the process of tacit knowledge sharing that provides maximum opportunity for both the source and the recipient to work together by using demonstration, observation and apprenticeship as a means. Tacit knowledge, as stated by Hermans and Castiaux, (2007), can be transferred through frequent personal contacts by means of shared experience which results in efficient collaboration and trust between partners. Nonaka and Toyama (2003) also noted that tacit knowledge requires spending specific time together in the same environment or shared experience to understand and learn from one another. Wei et al (2011) affirms that individual level tacit knowledge converts in to organizational level tacit knowledge through socialization. Moreover, strategically valued knowledge is embedded in the source firm's social context (Abou-Zeid, 2005) that needs to be shared through socialization.

The SECI model developed by Nonaka describe the formalization and communication mechanism between partners as well as it draws attention to the knowledge creation potential enabled by the transition between tacit and explicit state (Hermans & Castiaux, 2007). Face-to-face interaction, one of the means of socialization in Nonaka's model, is the primary means for tacit knowledge sharing as it is difficult to express tacit knowledge in verbal, symbolic and written form (Wang, 2014).

Externalization (tacit to explicit) is the process through which tacit knowledge is articulated in to explicit knowledge and shared to others as a basis to create new knowledge in the form of concepts, images, and written documents (Nonaka & Toyama, 2003). It is the process of transforming tacit knowledge into explicit knowledge through expression in comprehensible and documented form of knowledge that can be easily understood and shared across individuals, groups and organizations (Nonaka and Konno, 1998).

Combination (explicit-to- explicit) is the process of creating more complex explicit knowledge relevant to the organization by integrating internal and external explicit knowledge (Nonaka and Konno, 1998). The creation of knowledge through the process of combination can be facilitated by using information technology tools (Nonaka & Toyama, 2003). According to Nonaka and Konno (1998), the combination process takes place at three processes. First, capturing and integrating new explicit knowledge generated inside or outside the organization. Second, dissemination of new explicit knowledge is undertaken among organizational members by using appropriate communication channels. Third, revisiting and re-conceptualizing the explicit knowledge in to more usable and understandable form.

Internalization (explicit-to-tacit) is a process of converting explicit knowledge in to tacit knowledge (Nonaka and Konno, 1998). It is a process of transforming explicit knowledge in to tacit knowledge through learning by doing, training programs, simulations and experiments (Nonaka and Konno, 1998). It is a process of re-experiencing by studying and

reading documents from many sources (Nassuora, 2011) and testing, modifying, and embodying explicit knowledge as one's own tacit knowledge through learning-by-doing (Nonaka & Toyama, 2003).

2.5. University - Industry Knowledge Sharing Mechanisms

A variety of potential knowledge transfer mechanisms is available based on the diversity of knowledge and the way it interacts with economic process (Brennenraedts, Bekkers, & Verspagen, 2006). Three major types of KS strategies were identified by Tsui (2006) cited in Elizabeth (2015) based on the method of knowledge delivery: (1) writing, (2) speaking, and (3) information technologies. Accordingly, writing is typically used to change tacit knowledge into explicit knowledge and a very frequent strategy used to create and share knowledge.

Gulenc and Araci (n.d) states that due to the reason that firms do not have all knowledge in their internal sources, they need to take up external knowledge sources to reduce risk and environmental uncertainties. In this regard, the existence of knowledge in different forms such as explicit and tacit knowledge demands different mechanism for university and industry to share knowledge each other. Hence, plenary meetings, workshops, panel debates, inter-organizational group meetings, peer-review, joint research projects, internship experience, best practices, and many others are found important to share knowledge between university and industry (Chen *et al*, 2017; Rast *et al*, 2012). Research publications (journal articles and conference papers), technical reports, books and book chapters, newsletters have been the means through which explicit knowledge becomes public and accessible for many people (Brennenraedts et al, 2006; Elizabeth, 2015).

Knowledge sharing in modern organizations also occurs through formal and informal ways and the availability of technology can point to organizational values and norms. Formal ways include the regulation, routines and practices to archive knowledge in databases in an attempt to share it with others (Riege, 2005).As described by the author, conferences,

seminars, magazines, brochures, guidelines, training programs, structured group works and even the technical tools to share knowledge are also included in the formal ways of knowledge sharing. Informal ways of sharing knowledge, as stated by Riege (2005), help individuals to develop friendship leading to building of trust which in turn is critical for knowledge sharing.

University-industry knowledge sharing can take place through collaborative research, publications, contract research, consulting, participating in conferences and workshops, personnel exchange and informal networking which needs the interaction of university academicians and industry experts as partners (Freitas & Bekkers, 2007; Kumaraswamy & Chitale, 2012; Schartinger *et al*, 2002). Agrawal (2001) also identified publications, patents, conferences, consulting, contract research, personnel exchange and informal conversation as important knowledge transfer channels between university and industry.

Agrawal (2001) reviewed the extant literature on university-industry knowledge transfer and identified knowledge transfer channels such as publications, consulting, research contracts and personal exchange. D'Este and Patel (2007) also studied knowledge transfer mechanisms through which academic researchers in the UK interact with the industry and factors that influence the researchers engagement in a variety of interactions. They found that university researchers interact with industry using a wide variety of channels, and engage more frequently in the majority of the channels such as consultancy, contract research, joint research, and training than patenting and a spin-out activity.

Table 2.1: Knowledge Sharing/Transfer Mechanisms (Adapted from Brennenraedts et al, 2006; Agrawal, 2001; and **Schartinger et al., 2001**)

Publications	Scientific publications Publications A Co-publications Consulting of publications
Participation in conference and professional networks	Participation in conferences Exchange in professional organizations Participation in governmental organizations
Mobility of people	Mobility from university to industry Mobility from industry to public knowledge institutes Trainees Double appointments Temporarily exchange of personnel
informal contacts/ networks	Networks based on friendship
Cooperation in R&D	Joint R&D projects Presentation of research Supervision of a trainee or Ph.D. student Financing of Ph.D. research Sponsoring of research
Contract research and advisement	Contract-based research Contract-based consultancy

2.6. Motivation for sharing knowledge

A research conducted by Schartinger et al. (2001) on the relationships between universities and firms in Austria was found that organizations follow policies that encourage collaboration with HEIs. As stated by these authors universities collaborate with industry for various different reasons such as access to scientific resources, the exposure of students to practical problems and the potential employment opportunities for graduates. Santoro and Gopalakrishnan (2000) also stated that universities often interact with industry in order to obtain additional funding, particularly for research. According to these authors, universities also seek to gain access to industrial technical expertise, expose students and

faculty to practical problems, and provide employment opportunities to university graduates.

According to Kodcharat and Chaikew (2012), there are many kinds of motivations which enhance academics to engage with the industrial sectors. Some of the motivations that academics engage in industry sectors, according to these authors, are:

- To obtain research grant;
- To prove theory or to test research result;
- To gain more advanced knowledge from research being conducted;
- To publicize university mission;
- To obtain business opportunities;
- To apply knowledge derived from problem solving;
- To obtain both internship and employment opportunities; and
- To obtain stable and secure research funding

2.7. Factors Affecting Knowledge Sharing

Although knowledge sharing is important in any organization, there are different factors that will affect its effectiveness and efficiency. In this regard, different factors are identified by different scholars in their studies. For instance, Basu and Sengupta (2007) identify “integrated technical infrastructure, organizational culture, motivation and commitment of users and senior management support” as the four most critical success factors in their study conducted in the Indian Business School. In relation to university and industry knowledge sharing practices, rewards, availability of time, organizational effort, organizational culture and lack of interaction as the five most important barriers for knowledge sharing (Jain, 2007). Knowledge sharing factors in educational institutions as identified by Abdullah & Sulaiman (2016) are individual factors, organizational factors and technology factors. Similarly, Riege (2005) identified three dozens of factors affecting knowledge sharing and categorized them into three factors: individual, organizational and technological. Seyyedeh et al (2009) also identified contextual, organizational and the

nature of knowledge as the three major sets of factors of knowledge sharing in inter-organizational context. Nooshinfrad and Nemati-Anaraki (2014) also identified individual, organizational and technological factors as critical factors for inter-organizational KS.

In relation to individual factors according to Riege (2005) lack of time to share knowledge, apprehension of fear for job security, low awareness on the benefits of KS, differences in experience level, lack of contact time and interaction, poor verbal and interpersonal skills, age differences, gender differences, lack of social network, difference in education levels, lack of trust in people, fear of not receiving recognition, lack of trust in knowledge source accuracy and cultural differences are identified.

According to Nooshinfrad and Nemati-Anaraki (2014), the success of university-industry knowledge sharing practices also depends on the individual knowledge sharing behavior which can be influenced by different individual factors such as willingness, trust, attitude, motivation, communication and collaboration skills, and intention to share knowledge. They also believed that identifying these individual factors help to have a better knowledge sharing practice. Willingness implies, as stated by these authors, a positive attitude of the individuals to share knowledge to others who are in need of their knowledge. The knowledge sharing practice will not be effective, unless individuals are willing to share their knowledge to others. Hence, in order to share knowledge effectively individuals should be willing to share their knowledge to other parties.

Trust to share knowledge, according to Nooshinfrad and Nemati-Anaraki (2014), is likely influenced by the relationship established between the source and recipient and trust and also affects knowledge sharing success likely (Nooshinfrad & Nemati-Anaraki, 2014). Trust, according to these authors, can also facilitate KS by increasing effective collaboration among individuals in an organization or among organizations. Moreover, they stated that positive knowledge sharing attitudes of individuals also depend on their

expectations on the usefulness of their knowledge and belief that through KS they can improve relationships with others.

The different effects of motivation on KS were also noted by some extant literature. For instance, by acknowledging the work of Amar (2004), Nooshinfrad and Nemati-Anaraki (2014) stated that no amount of investment, infrastructure and technological intervention will make KS effective, unless individual employees are motivated to share their knowledge. According to Bulan and Sensuse (2012) individuals are important due to their role as knowledge creators and knowledge sharers. Hence, it is important to understand individual factors that influence knowledge sharing practices. In this study, individual refers to the academic staffs who are knowledge creators and users in the university.

With regard to the organizational factors, Riege (2005) outlined several major organizational barriers to KS as unclear/missing integration between KM initiatives into company's goals, lack of leadership and managerial direction, shortage of formal and informal spaces, lack of transparent rewards and recognition system, unsupportive corporate culture, low priority on knowledge retention on experienced staffs, shortage of appropriate infrastructure, deficiency of company resources for adequate KS practices, environment/layout of work area, hierarchical organization structure and size of business unit. Nooshinfrad and Nemati-Anaraki (2014) also noted the importance of organizational factors such as culture and organizational environment, motivations, management and leadership support, rewards and so on for KS success. These authors also stated that individuals expect to be recognized and rewarded for sharing their expertise knowledge with others. Stating the work of other researchers as evidence, they also noted recognition and reward as recommended intervention to facilitate KS. Management support for KS, one of the sub-factor of organizational factors identified by these authors, is also a better predictor of employee KS.

Knowledge sharing needs to be facilitated by incorporating various technological platforms (Islam, Jasimuddin, & Hasan, 2015). Among the technology factors highlighted by Riege (2005) are lack of integration of IT systems processes, lack of technical support, lack of maintenance of integrated IT systems, people's unrealistic expectation on IT, lack of compatibility between diverse IT systems processes, restriction due to mismatch between need requirements and IT system, people's reluctance to use IT systems and lack of training for familiarization of IT systems and processes.

Based on a review of literature on knowledge sharing, Ipe (2003) has identified the major factors that influence knowledge sharing between individuals in organizations are the nature of knowledge, motivation to share, opportunities to share, and the culture of the work environment. The nature of knowledge is related to its tacit and explicit form (Riege, 2005). The tacitness and explicitness of knowledge can be described by Riege (2005) as “how easy or difficult it is to codify and articulate the knowledge that needs to be”. Nonaka and Kong (2009) stated that knowledge that can be articulated and codified can be documented and then transfer more easily than non-codifiable knowledge.

Table 2.2. Factors affecting knowledge sharing

List of KS factors	Author(s)
Individual factors(trust, motivation, satisfaction, willingness, attitude, personal expectation, self-efficacy)	Riege, 2005; Lin, 2007; Ipe, 2003; Kodcharat and Chaikeaw, 2012; Nooshinfard and Nemati-Anaraki, 2014; Easter-by-Smith et al, 2008; Bulan and Sensuse, 2012 ; Kim and Ju, 2008
Organizational factors(management support, reward, organizational policy, organizational structure, organizational culture, work process, office layout,)	Riege, 2005; Lin,2007; Ipe, 2003; Kodcharat and Chaikeaw, 2012; Nooshinfard and Nemati-Anaraki, 2014; Easter-by-Smith, 2008; Bulan and Sensuse, 2012;
Technological factors(IT application, IT infrastructure, IT use)	Basu and Sengupta, 2007; Jain, 2007; Riege, 2005; Lin,2007; Ipe, 2003; Kodcharat and Chaikeaw, 2012; Nooshinfard and Nemati-Anaraki, 2014; Easter-by-Smith et al, 2008; Bulan and Sensuse, 2012; Seyyedeh et al , 2009
Nature of knowledge factor	Seyyedeh et al , 2009; Zhang <i>et al</i> , 2006

Among the list of factors provided in Table 2.2, only individual, organizational and technological factors were considered for this study.

2.8. Research Model

In this study different articles were reviewed to identify the factors that affect knowledge sharing. These factors are adapted from different literatures with some modification. Nooshinfrad and Nemati-Anaraki (2014) identified individual, organizational and technological factors as critical factors for inter-organizational KS. In their study, Nooshinfrad and Nemati-Anaraki (2014), also noted that the importance of organizational factors such as culture and organizational environment, motivations, management and leadership support, rewards and so on for KS success. These authors also stated that individuals expect to be recognized and rewarded for sharing their expertise knowledge with others. Stating the work of other researchers as evidence, they also noted recognition and reward as recommended intervention to facilitate KS.

Management support for KS, one of the sub-factor of organizational factors identified by these authors, is also a better predictor of employee KS. Lin (2007) also examined the influence of individual factors, organizational factors (top management support and organizational rewards) and technology factors (information and communication technology use) on knowledge sharing processes. Cheng et al (2009) also noted that to encourage and promote KS certain incentive schemes must be provided. Reward systems, according to Kim and Ju (2008), encouraged academicians to engage in KS activities. These authors found that faculty members valued rewards such as course load reduction to have more time, financial support for research, seminars and financial incentives.

According to Nooshinfrad and Nemati-Anaraki (2014), the success of university-industry knowledge sharing practices also depends on the individual knowledge sharing behavior which can be influenced by different individual factors such as willingness, trust, attitude, motivation, communication and collaboration skills, and intention to share knowledge. They also believed that identifying these individual factors help to have a better knowledge sharing practice. Trust and willingness to share knowledge, according to these authors, is likely influenced by the relationship established between the source and recipient and trust and willingness also affects knowledge sharing success likely (Nooshinfrad & Nemati-Anaraki, 2014).

Trust, Nooshinfrad & Nemati-Anaraki (2014), can facilitate KS by increasing effective collaboration among individuals in an organization or among organizations. Moreover, they stated that positive knowledge sharing attitudes of individuals also depend on their expectations on the usefulness of their knowledge and belief that through KS they can improve relationships with others. The different effects of motivation on KS were also noted by some extant literature.

The knowledge sharing model which is used to support this study was adapted from extant literature of Cheng *et al* (2009), Nooshinfrad and Nemati-Anaraki (2014), Seyyedeh *et al.* (2009), Lin (2007) and Ipe (2003). This model is based on three factors: organizational, individual and technology that influence knowledge sharing activities. Thus, individual factors (willingness, awareness, trust, motivation and satisfaction), organizational factors (management support, reward system, motivational scheme) and technological factors (ICT infrastructure and ICT use) were adapted from previous literature of Nooshinfrad & Nemati-Anaraki (2014), Seyyedeh *et al.* (2009), Cheng *et al* (2009), Lin (2007) and Ipe (2003) as shown in figure 2.

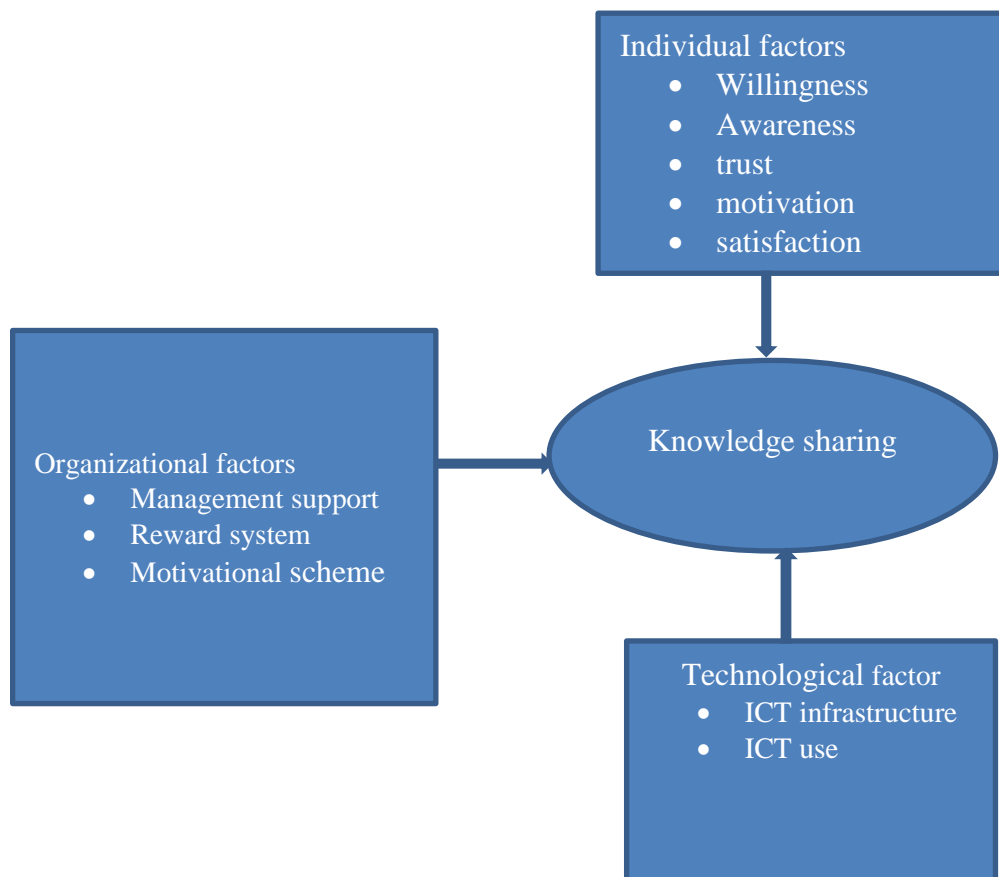


Figure 2: Research model

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1. Research Design

Research design is a research approaches that provide specific direction for procedures in a research of investigation within qualitative, quantitative, and mixed methods (Kothari, 2003). A research design that helps to collect quantitative data according to Creswell (2003) can be quantified and subjected to statistical treatment in order to support or counter “alternate knowledge claims”. In a quantitative study any number of strategies can be adopted when collecting data from respondents incorporate interviews, questionnaires, and observational tools. According to Creswell (2003), the qualitative research, on the other hand, permits the researcher to explore and better understand the complexity of a phenomenon and it is an effective model that occurs in a natural setting that helps the researcher to develop a level of detail from being highly involved in the actual experiences.

Mixed research method which consists of both quantitative and qualitative designs in research study evolved in response to the observed limitations of quantitative and qualitative designs (Creswell, 2003). For the purpose of this study, mixed research (quantitative and qualitative) approach was employed as this approach helps to triangulate research findings. A cross-sectional approach was employed for the purpose of this study. Cross-sectional approach was applied as the data for this study were collected at a single time.

3.2. Study Area

The seed for the current College of Veterinary Medicine and Agriculture of the Addis Ababa University was planted in 1963 with the establishment of the School of Animal Health Assistants to train manpower under the Diploma program. This school evolved to the Faculty of Veterinary Medicine in 1979 to train Veterinary Doctors and remained the sole training institution in the country for about 3 decades. The faculty started offering graduate program in Tropical veterinary epidemiology in collaboration with the

Freiere University of Berlin, Germany in 1996 which culminated in 2002. The Faculty attained a significant development in 2004/05 in that 8 MSc Programs and 1 BSc Program in Veterinary Laboratory Technology were launched. In 2009 the Faculty, again, launched 9 summer MSc programs. Another special and historical event in the history of the Faculty was the launching of 4 PhD program in 2009. Meanwhile, two UK-based animal welfare organizations, The Donkey Sanctuary and SPANA, were established and hosted in the College (<http://www.aau.edu.et>).

Currently, the College particularly, the Bishoftu Campus, is organized in to 5 academic departments. The College is currently accomplishing three core missions. These include teaching, problem-solving research and community services. In research, the College aspires to excel as both the students (VLT, DVM, MSc, and PhD) and academic staffs are totally engaged in animal health and production-related research undertakings under basic, applied and analytical research themes. The College promotes inter-disciplinary and problem-oriented research; thus, a number of cross-departmental, local and international collaborative research activities have been carried out in the college. Research results are usually publicized in different forms, namely peer reviewed journals, proceedings, books, book chapters, and teaching materials. One of the highest merits of the College is its enduring public services (<http://www.aau.edu.et>).

3.3. Population of the Study

A research population is a well-defined collection of all the objects, individuals or members that are well-known to have a common binding characteristic or feature. According to AAUCVM human resource department, February, 2018, AAUCVM has a total of 268 employees. Out of these 268 employees, 70.1 % (188) were support staff and 29.9 % (80) were academic staff. The source of population for this study consists of 80 academic staff and that met at least the minimum inclusion criteria set in order to get detailed and significant information about the factors that affect university-industry knowledge sharing practices. All 80 academic staffs of the college were fulfilling the minimum inclusion criteria, but only 66 were considered for this study.

3.4. Sample

Sample is a subset of a population that is used to represent the entire group as a whole. When doing research, it is often impractical to survey every member of a particular population because the total number of people is just too large (Kothari, 2004). The sample population for this study was drawn from the total population of academic staff at AAUCVM who fulfills the inclusion criteria stated as follows:

Inclusion Criteria: - All academic staff working at AAUCVM in all departments of the college, namely: animal production systems (APS), biomedical sciences(BMS), clinical studies(CLIS), parasitology and pathology(PAPA) and veterinary microbiology and public health(VMPH) with a minimum of first degree level of education with academic rank of lecturer, and who were engaged in academic activities that are a basis for knowledge generation and sharing with any years of experience were included in the study. This inclusion criterion is set to be sure those respondents qualify to easily understand and fill the research tools.

3.5. Sampling Technique and Sample Size

3.5.1 Sampling Techniques

Kothari (2004) described sampling as the selection of some part of an aggregate or population on the basis of which a judgment or inference about the aggregate or totality is made. It is the process of selecting units (e.g., people, organizations) from a population of interest so that by studying the sample it may be possible to objectively generalize research results back to the population from which the sample were chosen (Kothari, 2004).

The sampling technique, according to Kothari (2004), is classified in to probability sampling techniques where all parts of the population has equal chance of being selected as a sample and nonprobability sampling techniques is a technique that does not provide equal chance of being selected as a sample from all units of the population. For the purpose of

this study, both probability and non-probability sampling technique were employed. Probability sampling was applied to select questionnaire survey respondents. Non-probability sampling technique was also used in this study to select the organization where the study was conducted and interview informants from the selected organization.

Addis Ababa University (AAU) was selected for this study using purposive sampling techniques which is a nonprobability sampling technique. AAU was selected due to its relatively long history of existence which enable to have a huge accumulation of knowledge to be shared, its engagement in teaching, research and community service which is a core for knowledge creation and assumed to be easily accessible. Among the Addis Ababa University, College of Veterinary Medicine (CVM) was selected purposely due to its convenience and the researchers' interest to investigate the trend of KS practices at the given college.

To select the respondents from the selected college from all the 5 departments, simple random sampling technique was employed with the assumption of Kothari (2004) that simple random sampling generally eliminates bias and the sampling error can be estimated. Through random sampling all academics in each department of the selected college had an equal chance of being selected as a participant in the study. Therefore, a total of 66 academic staffs from all departments those who satisfy the inclusion criteria were selected to distribute the questionnaire designed for the purpose of this study through lottery method. The lottery was prepared by taking list of the academic staff from the selected college HRM; numbers were assigned to the names of the academic staff, and written on separate piece of papers and put in the container and well shaken. Hence, 66 lottery papers were picked randomly from the container and the names corresponding to the selected numbers were used as respondents. Moreover, three interview respondents were selected for the interview purposely as they are key informants for the purpose of this study.

3.5.2 Sample Size

Sample size refers to the number of items to be selected from the universe (Kothari, 2004). The size of sample should be optimum, neither to be too large, nor too small. A sample that is too large will lead to the waste of precious resources such as time and money, on the other hand, a sample that is too small will not allow gaining reliable perceptions. An optimum sample is one which satisfies the requirements of efficiency, representativeness, reliability and flexibility. While deciding the size of the sample, researchers must determine the desired precision as well as acceptable confidence level for the estimate. Sample size, according to Kothari (2004), is an important feature of any empirical study in which the goal is to make inferences about a population from a sample depends on various factors like size of population, the nature of population, and kind of study. The sample size for this study is determined by using Krejcie and Morgan (1970) sample determination table as shown in table 3.5.2 below.

Table 3.5.2: Sample size determination table

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is population size; S is sample size

Source: Krejcie and Morgan (1970)

3.6. Data Collection

Primary and secondary data are the two types of data used in research. Primary data are new information collected for the first time by a researcher, whereas secondary data are information already collected by others or somebody else and later used by a researcher (Kothari, 2004). The sources of data, for this study, were both primary and secondary sources of information. Data from primary sources were gathered from sample population of academic staff of Addis Ababa University college of Veterinary medicine through structured questionnaire and interview. To draw secondary sources of data, both published and unpublished, were also consulted to draw related literature.

3.6.1. Questionnaire

Questionnaires are the most commonly used data gathering instruments and consist of mainly closed questions with a choice of fixed answers (Creswell, 2003). Questionnaires can be close ended, open ended, or both close ended and open ended (mixed) (Kothari, 2004). The instrument was developed through consulting relevant studies in the extant literature, with the intent that it generates objective, numeric data on trends and actual practices of KS and factors affecting university-industry KS practices.

The questionnaire was prepared in English and pre-tested by distributing for 5 PhD students of veterinary medicine prior to the actual data collection in the target population. Based on the feedback obtained from the 5 PhD student respondents some questions were avoided and some were modified after the pre-test.

The questionnaires were designed in five-point Likert-scale in which respondents were asked to provide relevant data on a set of statements about how frequently engaged in university-industry KS practices using the scales “never”, “rarely”, “sometimes”, “often”, and “always. The scale for KS motives and factors affecting university-industry knowledge sharing practice range from strongly disagree to strongly agree. It is preferred to use the Likert scale in this study because, it is easy to understand and it requires less effort to answer for respondents and also relatively easy to analyze and interpret the data.

The questionnaires were adopted from existing literatures (Freitas & Bekkers, 2007; Rahel & Ermias, 2011, D’Este & Patel, 2007; Nooshinfrad & Nemati-Anaraki, 2014; Seyyedeh et al , 2009 and Ipe, 2003). Some modification was made to fit the questionnaires for the specific context and the objectives of this study. Questionnaires were the main instrument employed to collect data from selected respondents. Interviews were also conducted with the selected college associate deans and a department head. Besides, observation was made to collect additional information for this study. The questionnaires have two parts; the first part of which were about demographic information of respondents that is questions

associated with age, sex, level of education, experience in higher learning institution, academic department, and academic rank. Part two of the questionnaires consist of closed ended questions intended to address university-industry knowledge sharing practices and factors affecting university-industry knowledge sharing practices taking in to consideration the case of AAUCVM.

3.7. Procedures of Data Collection

To collect quantitative data, the paper-based questionnaires were prepared and distributed to the selected respondents. The questionnaires were distributed to 66 academicians via office-to-office visit in person. This method provided opportunity to explain to the respondents about the questionnaire if they have anything unclear and to ask their willingness to participate as sample respondents for this study. A total of 66 questionnaires were distributed and 98.5% (65) questionnaires were appropriately filled and returned.

3.8. Reliability

The objective of reliability is to be sure that, if the study is repeated by following exactly the same procedure used by an earlier study and conducted the same case study all over again, the latter researcher arrives at the same result (Yin, 2009). In Likert-type scales, it is important to calculate Cronbach's alpha coefficient to test internal consistency or reliability (Han & Anantamula, 2007). According to them the acceptable values of alpha value is 0.7. The low value of alpha (<0.70) indicate poor inter-relatedness between items and a high value of alpha (> 0.95) may suggest redundancies in the scale items. In addition, most research recommended using value of alpha ≥ 0.7 . For this study, the alpha value ≥ 0.7 was considered as acceptable as some authors consider items whose Alpha coefficient is 0.7 and above as reliable (Han & Anantamula, 2007). Thus, the overall Chronbach alpha test value is 0.848 which indicated that there is a high consistency among the items.

3.9. Methods of Data Analysis

The data was described by using statistical techniques, both descriptive and inferential statistics. Accordingly, mean, standard deviation, frequency distribution and percentage were used to describe the collected data. For items with a 5- point- Likert type that requested respondents how frequently they engaged in KS practices, the ideal mean value ranges as: 0-1.49 as “never”, 1.50-2.49 as “rarely”, 2.50-3.49 as “sometimes”, 3.50-4.49 as “often” and 4.50-5.00 as “always”. Similarly, for items with a 5- point- Likert type that requested respondents about their level of agreement on their motives to share knowledge to industry stakeholders and engagement in KS practices, the ideal mean value ranges as: 0-1.49 as “strongly disagree”, 1.50-2.49 as “disagree”, 2.50-3.49 as “neutral”, 3.50-4.49 as “agree” and 4.50-5.00 as “strongly agree.” Moreover, linear regression was employed to predict statistical effect and relations between variables. The p-value is either < 0.05 or > 0.05 . If it is less than 0.05, there is a statistical significant effect and correlations. If the p-value is greater than 0.05, there is no statistically significant effect and correlations. All quantitative data were analyzed using Statistical Package for Social Science (SPSS-version 20.0). On the other hand qualitative data was analyzed by narration and description.

CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION OF FINDINGS

The quantitative data was collected through a questionnaire administered to 66 academicians working in Addis Ababa University College of Veterinary Medicine during 2018 academic year. The questionnaires were distributed for 66 academicians. But, one questionnaire was not filled and returned back due to the difficulty to get a respondent in office. The qualitative data was also collected by using interview with 3 key informants of AAUCVM within similar time frame indicated above. Hence, the analysis of the data was based on 65 returned questionnaires and 3 interview responses. In general, the total number of questionnaires distributed were 66 and the returned questionnaires were 65 with a response rate of 98.5%.

4.1. Profile of the Respondents

The key demographic characteristics of respondents in terms of gender, age, level of education, academic rank, years of experience in higher learning institution and their respective department are presented in Table 4.1, as shown below. The gender composition of respondents revealed that majority of the respondents were male which comprises of 95.4% (62) and the remaining 4.6 % (3) were female. The highest percentages of respondents 55.4% (36) were within the age group of 41-50 years. Respondents with age group 31-40 years account 23.1% (15) of the total respondents. The remaining 15.4% (10) and 6.2% (4) were within the age group of above 50 years and 23-30 years respectively. With regard to respondents' level of education most of the respondents 56.9% (37) were PhD holder, 36.9% (24) were master's degree holder and 6.2% (4) were first degree holder.

Concerning respondents' distribution by academic rank, 47.7% (31) were associate professor, 32.3% (21) were assistant professor, 15.4%(10) were lecturer and only 4.6%(3) of the respondents were full professors. Regarding to respondents experience in higher learning institutions, 58.5% (38) were the most experienced respondents who have work experience in higher learning institutions above 10 years, respondents with 3-10 years' experience in higher learning institutions were 38.5% (25) and the least experienced respondent of the study (less than 3 years of experience in higher learning institution) were

account 3.1 % (2) of the total respondents. With regard to their respective academic department of the respondents, 23.1% (15) were from Clinical Studies(CLIS), 21.5% (14) were from parasitology and pathology(PAPA) department, 20% (13) of respondents were from department of Biomedical Sciences(BMS) and the rest 20%(13) were from department of Veterinary Microbiology and Public Health(VMPH).

Table 4.1: Respondents' profile

Respondents Profile	Classification	Frequency	Percent
Gender	Male	62	95.4
	Female	3	4.6
Age Group	23-30 years	4	6.2
	31-40 years	15	23.1
	41-50 years	36	55.4
	Above 50 years	10	15.4
Level of Education	First Degree	4	6.2
	Master's Degree	30	46.2
	PhD	31	47.7
Academic Rank	Lecturer	10	15.4
	Assistant Professor	21	32.3
	Associate professor	31	47.7
	Professor	3	4.6
Experience	Less than 3 years	2	3.1
	3-10 years	25	38.5
	Above 10 years	38	58.5
Department	APS	10	15.4
	BMS	13	20.0
	CLIS	15	23.1
	PAPA	14	21.5
	VMPH	13	20.0

Source: Questionnaire survey, 2018

4.2: Knowledge sharing practice

One of the objectives of this study is to investigate university-industry knowledge sharing practice. This research use Nonaka's SECI model to investigate university- industry knowledge sharing practice.

The analysis in this section follows a descriptive approach by using the output from the SPSS Version 20 statistical software to show respondents responses on the 13-itemed Dependent Variable, as shown in table 4.2, academics were asked how frequently they engaged in knowledge sharing practices with industry stakeholders. In this regard, 69.2% (45) of the academics assured that they were often engaged in knowledge sharing practices with industry stakeholders through joint publications, 53.8%(35) were often engaged in knowledge sharing activities through training company employees and contract research, 50.8%(33) academicians were often engaged in knowledge sharing activities through joint research and 49.2%(32) were often engaged in KS activities through professional memberships. On the other hand, 49.2%(32), 46.2%(30), 44.6%(29), 13.1%(28) and 30.8%(20) of the academicians stated that they were rarely engaged in KS activities through participating in standard setting forum, personal network, informal advice, consultancy services and hosting of personnel respectively. From this, joint publications, training company employees, contract research, joint research and participating in professional membership are the top five KS practice academicians often used to interact with industry stakeholders in Addis Ababa University College of Veterinary Medicine. Participating in standard setting forums, personal networks, informal advice, consultancy services and hosting of personnel were the five rarely used knowledge sharing practices by academicians in AAUCVM.

Table 4.2: Knowledge sharing practice

Types of KS practice	Never	Rarely	Sometimes	Often	Always
Training company employee	12(18.5%)	14(21.5%)	-	35(53.8%)	4(6.2%)
Attending conferences	6(9.2%)	23(33.8%)	2(3.1%)	26(40%)	9(13.8%)
Standard setting forums	6(9.2%)	32(49.2%)	2(3.1%)	16(24.6%)	9(13.8%)
Personal networks	–	30(46.2%)	3(4.6%)	20(30.8%)	12(18.5%)
Professional membership	2(3.1%)	11(16.9%)	7(10.8%)	32(49.2%)	13(20%)
Giving invited lectures	10(15.4%)	18(27.7%)	3(4.6%)	28(43.1%)	6(9.2%)
Hosting of personnel	9(13.8%)	20(30.8%)	5(7.7%)	27(41.5%)	4(6.2%)
Joint research	6(9.2%)	10(15.4%)	6(9.2%)	33(50.8%)	10(15.4%)
Contract research	7(10.8%)	15(23.1%)	7(10.8%)	35(53.8%)	1(1.5%)
Consultancy services	6(9.2%)	28(43.1%)	6(9.2%)	18(27.7%)	7(10.8%)
Informal advice	1(1.5%)	29(44.6%)	10(15.4%)	23(35.4%)	2(3.1%)
Setting up physical facilities	19(29.2%)	15(23.1%)	3(4.6%)	23(35.4%)	5(7.7%)
Joint publications	6(9.2%)	3(4.6%)	2(3.1%)	45(69.2%)	9(13.8%)

Source: Questionnaire survey, 2018

4.3: Motivations for KS Practice

Motivation of academic staff determine their engagement in knowledge sharing practice so, knowing their level of motivation and motivational system is important to take appropriate measures. To understand why academics engaged in KS practices and interact with industry stakeholders, respondents were asked to rate a range of motives on a scale from strongly disagree to strongly agree. Table 4.3 shows that the academicians level of agreement or disagreement on their motivation to engage in KS activities with stakeholders industry were concerned with developing the research activities of academics such as: testing the practical

application of research agreed by 81.5%(53); create student project and job placement opportunity agreed by 80%(52); and gain knowledge about practical problems and knowledge application agreed by 75.4%(49) of the respondents.

Table 4.3: Motivations for KS activities

Motivations for KS	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Test the practical application of research	2(3.1%)	2(3.1%)	8(12.3%)	53(81.5%)	–
Secure access to specialist equipment, materials or data	6(9.2%)	7(10.8%)	10(15.4%)	38(58.5%)	4(6.2%)
Secure access to the expertise of researchers	4(6.2%)	2(3.1%)	16(24.6%)	43(66.2%)	–
Gain knowledge about practical problems and knowledge application	2(3.1%)	2(3.1%)	10(15.4%)	49(75.4%)	2(3.1%)
Create student project and job placement opportunity	3(4.6%)	4(6.2%)	6(9.2%)	52(80%)	10(15.4%)
Secure funding for research	2(3.1%)	8(12.3%)	10(15.4%)	21(32.3%)	24(36.9%)
Look for business opportunities	2(3.1%)	9(13.8%)	12(18.5%)	24(36.9%)	18(27.7%)
Support university/college outreach mission	2(3.1%)	8(12.3%)	4(6.2%)	25(38.5%)	26(40%)

Source: Questionnaire survey, 2018

4.4. Factors Affecting University-Industry Knowledge sharing Practices

In an attempt to investigate the main factors affecting university-industry knowledge sharing practices considered for this study, the survey questionnaires were grouped in to individual, organizational and technological factors. Accordingly, the following findings

were obtained and presented in table 4.4.1, table 4.4.2 and table 4.4.3 for individual, organizational and technological factors respectively.

4.4.1. Individual Factors

The success of university-industry knowledge sharing depends on the individual knowledge sharing behavior which can be influenced by different factors (Nooshinfrad & Nemati-Anaraki, 2014). Identifying this factors help to have a better knowledge sharing practice.

Table 4.4.1: Individual Factors

Individual Factors	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean value	Std. Dev.
I am willing to share knowledge to industry stakeholder	–	2(3.1%)	–	44(67.7%)	19(29.2%)	4.23	.605
I am satisfied by the existing knowledge sharing strategies with industry stakeholders	6(9.2%)	43(66.2%)	4(6.2%)	9(13.8%)	3(4.6%)	2.38	.995
I trust to share knowledge with industry stakeholders	4(6.2%)	5(7.7%)	2(3.1%)	39(60%)	15(23.1%)	4.63	6.431
I am highly motivated to share knowledge to industry stakeholders	–	8(23%)	5(7.7%)	37(56.9%)	15(23.1%)	3.91	.897
I know that sharing knowledge is one of my duties	–	2(3.1%)	2(3.1%)	41(63.1%)	20(30.8%)	4.22	.649

Source: Questionnaire survey, 2018

Willingness to share knowledge is likely influenced by the relationship established between the source and recipient; and willingness affects knowledge sharing success likely (Nooshinfrad & Nemati-Anaraki, 2014). In this regard, as shown in in Table 4.4.1 respondents were asked to express their level of agreement on their willingness to share knowledge to industry stakeholders. In line with this, 67.7% (44) confirmed their willingness to share knowledge to industry stakeholders. The mean value of responses is 4.23 which imply that academicians are highly willing to share knowledge to industry stakeholders.

With regard to the respondents' level of satisfaction on the existing university-industry knowledge sharing strategy, majority of the respondents 66.2% (43) expressed their disagreement. The mean value of responses is 2.38 which imply academicians under the study organization are not satisfied with the existing strategy to share knowledge to industry stakeholders.

Trust is an essential attribute for the success of knowledge sharing and can increase effective collaboration among individuals in an organization or among organizations (Nooshinfrad & Nemati-Anaraki, 2014). As stated by Kim and Ju (2008) in their study on "An analysis of faculty perceptions: Attitudes toward knowledge sharing and collaboration in an academic institution", trust was not found significantly associated with KS. Respondents were also asked to provide whether they trust to share knowledge to industry stakeholders. As a result, 60% (39) agreed and 23.1% (15) strongly agreed on the presence of trust to share knowledge to industry stakeholders. The mean value of responses is 4.63 which indicate that academicians in the study organization are highly trusted to share their knowledge to industry stakeholders.

Motivation is one of the driving factors for individuals to share their knowledge and knowledge sharing can be managed only by motivating individuals (Nooshinfrad & Nemati-Anaraki, 2014). According to these authors, if employees are not motivated to share

their knowledge, no amount of investment, infrastructure and technological intervention will make it effective. With regard to this, the study result revealed that 56.9% (37) agreed and 23.1% (15) strongly agreed that they are motivated to share knowledge to industry stakeholders; however, 23% (8) disagreed. The mean value of responses is 3.91 that indicate the respondents' agreement on their motivation to share knowledge to industry stakeholders.

From the survey results revealed and the responses of the interview respondents, it is possible to infer that academicians in the study college are sharing their knowledge to industry stakeholders. With regard to their level of awareness, respondents were asked whether they are well aware that knowledge sharing is one of their duties, 63.1 % (41) and 30.8 % (20) of the respondents agreed and strongly agreed that knowledge sharing is one of their duties respectively. The mean value of responses is 4.22 which imply most of the respondents are aware that knowledge sharing is one of their duties.

Generally, the descriptive analysis for individual factors indicate that trust (mean = 4.63, Std. Dev. = .643) is the most important factor that affect knowledge sharing practices followed by willingness (mean = 4.23, Std. Dev. = .605), awareness (mean = 4.22, Std. Dev. = .649) and motivation (mean = 3.91, Std. Dev. = .897).

4.4.2. Organizational Factors

As shown in Table 4.4.2, 30.8 % (20) of the respondents agreed and 7.7 % (5) strongly agreed on the presence of motivational schemes by their university/colleges. The mean value of responses for this item indicates that majority of the responses lied on neutral. In general, as indicated in 4.4.2, except management support on career development with mean value of 3.57 and academic and administrative promotion with mean value of 3.92, the rest responses lied on the range of disagreement, which implies that in the implementation of KS there is lack of motivational scheme to share knowledge, lack of budget to create, acquire and share knowledge, lack of regular plan for knowledge

sharing, lack of knowledge sharing platform and lack of policy or strategy to share knowledge.

Table 4.4.2: Organizational Factors

Organizational factors	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean value	Std. Dev.
There is motivational schemes to encourage KS outside my university/college	6(9.2%)	11(16.9%)	23(35.4%)	20(30.8%)	5(7.7%)	3.11	1.077
My university/college supports career development to encourage KS	2(3.1%)	7(10.8%)	18(27.7%)	28(43.1%)	10(15.4%)	3.57	.984
Academic and administrative promotions help improve KS practice	6(9.2%)	5(7.7%)	2(3.1%)	42(64.6%)	12(18.5%)	3.92	.797
In my university/college there is budget dedicated to acquire and share knowledge	4(6.2%)	27(41.5%)	14(21.5%)	10(15.4%)	10(15.4%)	2.92	1.203
In my university/college there is periodic plan to acquire, organize and share knowledge	2(3.1%)	29(44.6%)	16(24.6%)	11(16.9%)	7(10.8%)	2.88	1.083
My university/college facilitates knowledge sharing platforms (workshops, seminars...)	–	24(36.9%)	12(18.5%)	21(32.3%)	8(12.3%)	3.20	1.078
My university/college has a policy or strategy for research communication and dissemination	30(30.8%)	20(30.8%)	12(18.5%)	22(33.8%)	11(16.9%)	3.37	1.098

Source: Questionnaire survey, 2018

4.4.3 Technological Factors

Table 4.4.3: Technological Factors

Technological Factors	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean value	Std. Dev.
My university/college has a very up-to-date ICT infrastructure that enable to share knowledge	2(3.1%)	32(49.2%)	6(9.2%)	19(29.2%)	6(9.2%)	2.92	1.136
My university/college use appropriate KMS to share knowledge	4(6.2%)	23(35.4%)	22(33.8%)	12(18.5%)	4(6.2%)	2.83	1.009
My university/college utilize Intranet and Internet to share knowledge	–	6(9.2%)	13(20%)	42(64.6%)	4(6.2%)	3.68	.731
My university/college website updated regularly to share knowledge	6(9.2%)	27(41.5%)	18(27.7%)	10(15.4%)	4(6.2%)	2.68	1.047

Source: Questionnaire survey, 2018

With regard to technological factors, respondents were requested to rate their level of agreement as to the existence of up to date ICT infrastructure, appropriate knowledge management system, utilization of the Internet to share knowledge and websites of the university/college updated regularly. In this regard, only the mean responses on utilization of the Internet lies on the range of agreement, the rest responses lied on the range of disagreement. As shown in Table 4.4.3 the study results revealed that among the technology factors respondents have a positive perception only for utilization of Internet for knowledge sharing, while there were lack of up-to-date ICT infrastructure, lack of appropriate knowledge sharing system to share knowledge, lack of knowledge sharing platform and lack of updated website to share knowledge were identified.

Table 4.5: Result of Spearman Correlation coefficient

Independent variables		Dependent variables(KS)
Individuals Willingness to share knowledge	Correlation coefficient	.581**
	Sig. (2-tailed)	.000
	N	65
Individuals Satisfaction	Correlation coefficient	.106
	Sig. (2-tailed)	.400
	N	65
Individual's trust to share knowledge	Correlation coefficient	.612**
	Sig. (2-tailed)	.000
	N	65
Individual motivation	Correlation coefficient	.545**
	Sig. (2-tailed)	.000
	N	65
Individuals awareness of KS as duties	Correlation coefficient	.513**
	Sig. (2-tailed)	.000
	N	65
Organization's motivational scheme	Correlation coefficient	-. 228
	Sig. (2-tailed)	.067
	N	65
Organizational support	Correlation coefficient	.206
	Sig. (2-tailed)	.099
	N	65

Organizational support for promotion	Correlation coefficient	.277*
	Sig. (2-tailed)	.025
	N	65
Organizational budget for KS	Correlation coefficient	.213
	Sig. (2-tailed)	.089
	N	65
Periodic plan for KS	Correlation coefficient	.346**
	Sig. (2-tailed)	.005
	N	65
KS platform (workshops, seminars..._	Correlation coefficient	.199
	Sig. (2-tailed)	.111
	N	65
KS policy or strategy	Correlation coefficient	.296*
	Sig. (2-tailed)	.017
	N	65
Up-to-date ICT infrastructure	Correlation coefficient	.331**
	Sig. (2-tailed)	.007
	N	65
KMS to share knowledge	Correlation coefficient	.156
	Sig. (2-tailed)	.216
	N	65
ICT utilization (Internet)	Correlation coefficient	-.194
	Sig. (2-tailed)	.122

	N	65
Website updated regularly to share knowledge	Correlation coefficient	.443**
	Sig. (2-tailed)	.000
	N	65

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

The correlation coefficient result shows that the association between independent and dependent variables. Correlation between dependent variable (KS) and willingness is 0.581. There is a statistically significant positive relationship between trust and knowledge sharing ($r = .612, p < .01$); willingness and knowledge sharing ($r = .581, p < .01$); individual motivation and knowledge sharing ($r = .545, p < .01$); and awareness and knowledge sharing ($r = .513, p < .01$). There is a statistically significant but weaker positive relationship between periodic plan and knowledge sharing ($r = .346, p < .01$); and organizational support for promotion and knowledge sharing ($r = .277, p < .05$).

Linear regression is used to test the data if it is normally distributed. As shown in Figure 3, the histogram is nearly similar to the normal curve and it meets the linear regression requirement.

Figure 3: Distribution of data by normal curve

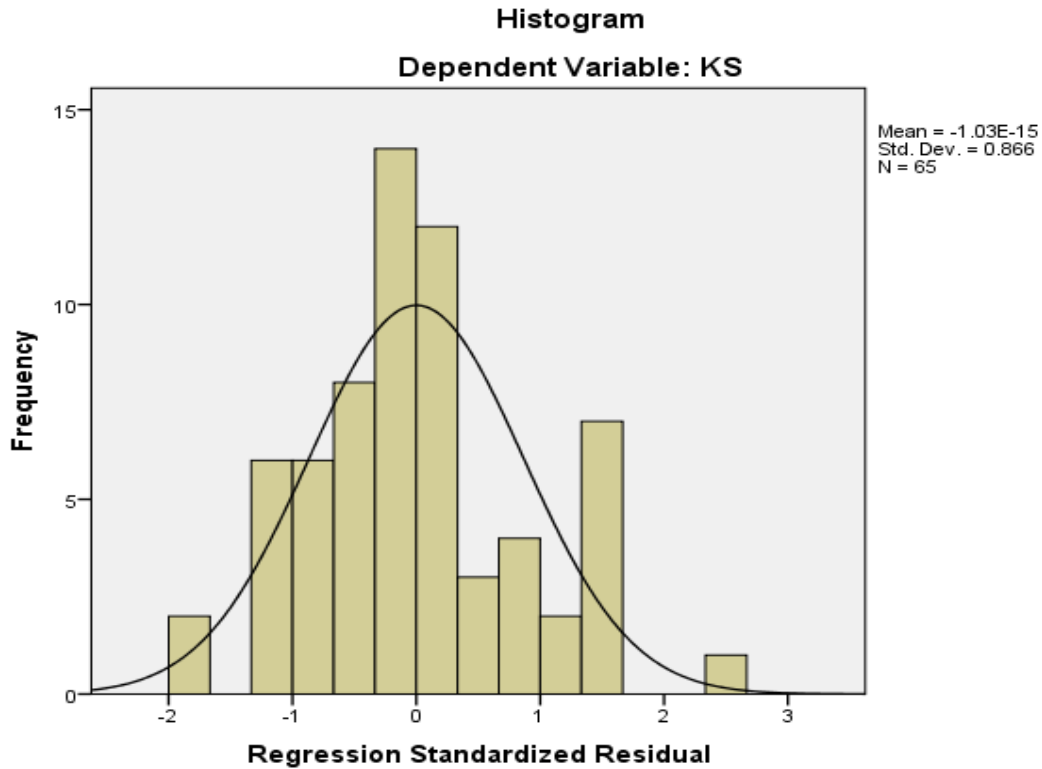


Table 4. 6: Linear Regression Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.870 ^a	.758	.677	5.41322

a. Predictors: (Constant), Website, Plan, Motivation, Trust, willingness, ICT infrastructure, Promotion, Policy or strategy, Duties

b. *Dependent Variable: KS*

As indicated in Table 4.6 the identified factors that affect KS practices can explain only 67.7% of the variations/changes of the KS practices. This implies that about 32.3% of the variation/change is explained by other factors which need further research to identify those factors.

Table 4.7: Acceptability of Model Fitness (ANOVA (b))

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4398.444	16	274.903	9.381	.000 ^b
Residual	1406.541	48	29.303		
Total	5804.985	64			

a. Dependent Variable: KS

b. Predictors: (Constant), Website, Plan, Motivation, Trust, willingness, ICT infrastructure, Promotion, Policy or strategy, Duties

As shown in Table 4.7, the acceptability of the model has also checked with ANOVA and the model is acceptable and statistically significant at 95% level of confidence. The value of the sum of squares for regression is greater as compared to residual.

4.8. Interview Results

Respondents were requested to express their fillings about the knowledge sharing practices of their departments in their college. To this end, the responses of two respondents are presented as follows:

“Academic staffs in our department are engaged in teaching, research and community services. We produce a huge amount of research outputs year by year together with MSc and PhD students in our department. Sometimes we have seminar sessions to share the research output to the academic community in our college. But, the most frequently used knowledge sharing mechanism is publishing the research outputs in academic journals.”

Another question raised for the interview respondents to answer was about the existence of formal knowledge sharing mechanisms with stakeholder industry and to express the mechanisms if any. With regard to this one respondent provided his responses that there is

no formal way to share knowledge except that MSc and PhD students are obliged to submit their final thesis work to the college library. But, two of the interview respondents expressed that formal KS mechanism exist in their college. Some of the formal KS mechanisms they mentioned are assigning DVM students for externship in different stakeholder industries to have practical experience; conducting joint and collaborative research in thematic areas with stakeholder industries; advising PhD students collaboratively with industry practitioners; and joint publication with experts from stakeholder industries.

The interview respondents were also asked whether they participate in different knowledge sharing activities such as workshops, seminars, forums and training. In this regard, one respondent expressed as follows:

“I often participate in training, but rarely participate in seminars, workshops and forums. Sometimes there are seminars and workshops to report thematic research outcomes participating practitioners from stakeholder industries by thematic research themes of the college, but it is very infrequent and doesn't improve anything. There are very few opportunities to share knowledge and discuss with participants from stakeholder industries.”

Questions were also provided to interview respondents to what extent the knowledge created in CVM applied to stakeholder industry. In connection to this the response of one respondent is presented as is as follows:

“We know that we are responsible to create and share knowledge to the respective stakeholders and I think no one will be refraining to create and to share knowledge to stakeholders. We are here to bring new ideas through research that will enable to solve the existing problem in and within the community and we are motivated to do so. I feel very happy when someone asked me to share my experience and I will share my knowledge voluntarily if anyone asks me in the future without any payment.”

With regard to the existence of KS policy and strategies, questions were provided for interview respondents. In relation to this, all the three interview respondents replied that policies and strategies exist in the senate legislation of AAU that governs all the colleges and institutions under it. But, the existence of these policies and strategies only do not produce practical outcomes and positive impact on KS practices due to lack of effective mechanism to enforce them. They also stated that publishing articles on reputable journals is put as a policy of the university top promote from one academic rank to the next higher academic rank. There are also monetary incentives in the form of research allowance provided for academic staffs who publish articles in reputable journals. According to the responses of interview respondents, although there is no satisfactory output reached to stakeholder industry and brings the expected outcomes the university have strategies to increase academic engagement in research such as providing budget for thematic research.

Interview respondents were also asked to identify the factors that university-industry affect university-industry knowledge sharing practices at present time. In relation to this an interview respondent stated in the following way:

“There are different challenges that influence knowledge sharing. Some are borne due to reluctance from management of our college, some others stem from government policies and others stem from stakeholder organizations. From the management side there is no formal line to create relationship with stakeholder organizations. Everything is facilitated through informal networks.”

Another respondent also stated that lack of time, lack of sufficient budget, lack of commitment *and skill as the challenges to share knowledge to stakeholder industry.*

4.9. Discussion of Findings

University-industry knowledge sharing can take place through collaborative research, publications, contract research, consulting, participating in conferences and workshops, personnel exchange and informal networking which needs the interaction of university

academicians and industry experts as partners (Freitas & Bekkers, 2007; Kumaraswamy & Chitale, 2012; Schartinger *et al*, 2002). The findings of this study revealed that academicians often engaged in KS practices with stakeholder industry through joint publications, training company employees, contract research, joint research and professional membership. The result of this study is therefore, similar to Schartinger *et al*, (2002) and D'Este and Patel (2007) except participating in conferences and workshops, personnel exchange and informal networking that were the rarely practice identified in this research contrary to Schartinger *et al*, (2002).

With regard to the motivation of academicians to share knowledge to industry stakeholders, the findings of this research revealed that academic staffs motivated to share their knowledge to stakeholder industry to test the practical application of their research; to create student project and job placement opportunity; and to gain knowledge about practical problems and knowledge application which consistent to the research finding of Kodcharat and Chaikew (2012).

According to Nooshinrad and Nemati-Anaraki (2014), the success of university-industry knowledge sharing practices also depends on the individual knowledge sharing behavior which can be influenced by different individual factors such as willingness, trust, attitude, motivation, communication and collaboration skills, and intention to share knowledge. They also believed that identifying these individual factors help to have a better knowledge sharing practice. Trust and willingness to share knowledge, according to these authors, is likely influenced by the relationship established between the source and recipient and trust and willingness also affects knowledge sharing success likely (Nooshinrad & Nemati-Anaraki, 2014).

In relation to the individual knowledge sharing factors, the findings of this research revealed that willingness, motivation, and trust to share knowledge and awareness that KS

is one of the duties identified as the most important factors that affect knowledge sharing practices. This result is supported by the study of Nooshinfrad & Nemati-Anaraki (2014).

Trust is an essential attribute for the success of knowledge sharing and can increase effective collaboration among individuals in an organization or among organizations (Nooshinfrad & Nemati-Anaraki, 2014). As stated by Kim and Ju (2008) in their study on “An analysis of faculty perceptions: Attitudes toward knowledge sharing and collaboration in an academic institution”, trust was not found significantly associated with KS which is contrary to the findings of this research.

With regard to organizational factors, majority of the respondents claimed that management support career development and academic and administrative promotion for sharing knowledge. On the contrary, majority of the respondents disagreed on organizational support on motivational scheme, budget allocated to KS, presence of KS platform and existence of KS policy or strategy. From this it is possible to conclude that there exists lack of motivation, lack of budget, lack of regular plan, lack of KS platform and lack of policy or strategy were an organizational factors that affect knowledge sharing. From the analysis of the data from causal relationship analysis organizational factors (providing promotion for KS and the existence of policy and strategy) were identified which have significant impact on knowledge sharing practices.

Nooshinfrad & Nemati-Anaraki (2014) found that the availability and usability of technology have significant influence on KS. With regard to technological factors; utilization of Internet to share knowledge was rated positively by majority of the respondents. However, lack of up-to-date ICT, lack of appropriate knowledge management system and website not updated regularly to share knowledge were identified as technological factors that affect knowledge sharing practices. Moreover, a website for AAU and a web page for AAUCVM were visited frequently; there is no content and a single update/change on CVMA web page. Technological factors (presence of up-to-date ICT

infrastructure and up-to-date- website) have significant impact on knowledge sharing practices. Riege noted that most KS practices would be less effective without technology.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1. Conclusion

This study has focused on the university-industry knowledge sharing practice and factors affecting university-industry knowledge sharing in the case of Addis Ababa University College of Veterinary Medicine. It explores how knowledge is shared between university and industry and what are the factors that affect university-industry knowledge sharing practices.

- One of the objectives of this study is to examine how knowledge is shared between university and industry. Hence, the finding of this study reveals that the top five university-industry knowledge sharing practices identified were joint publications, training company employees, contract research, and joint research and participating in professional membership. However, participating in standard setting forums, personal networks, informal advice, consultancy services and hosting of personnel are the five rarely used knowledge sharing practices by academicians in AAU CVMA.
- The second objective of this study was to identify factors that affect university-industry knowledge sharing practices. In line with this, different questions under individual factors, organizational factors and technological factors were grouped and forwarded to the respondents. In this regard, taking individual factors in to account, majority of the respondent 46.7% which imply that academicians are highly willing to share knowledge to industry stakeholders; 60% of the respondents were trust to share knowledge; more than half 56.9% of the respondents were motivated to share knowledge and 63.1% of the respondents were aware that sharing knowledge is one of their duties. However, about 66% of the respondents were not satisfied by the existing knowledge sharing practices between university and industry stakeholders. The interview respondents also identified lack of time as individual factors that affect knowledge sharing practices. Individual factors (willingness, motivation, and trust to share knowledge and awareness that KS is one of the duties) were the factors identified which have significant impact on knowledge sharing practices.

- With regard to organizational factors, majority of the respondents claimed that management support career development and academic and administrative promotion for sharing knowledge. On the contrary, majority of the respondents disagreed on organizational support on motivational scheme, budget allocated to KS, presence of KS platform and existence of KS policy or strategy. From this it is possible to conclude that there exists lack of motivation, lack of budget, lack of regular plan, lack of KS platform and lack of policy or strategy were an organizational factors that affect knowledge sharing. From the analysis of the data from causal relationship analysis organizational factors (providing promotion for KS and the existence of policy and strategy) were identified which have significant impact on knowledge sharing practices.

- With regard to technological factors, utilization of Internet to share knowledge was rated positively by majority of the respondents. However, lack of up-to-date ICT, lack of appropriate knowledge management system and website not updated regularly to share knowledge were identified as technological factors that affect knowledge sharing practices. Moreover, a website for AAU and a web page for AAUCVM were visited frequently; there is no content and a single update/change on CVMA web page. Technological factors (presence of up-to-date ICT infrastructure and up-to-date- website) have significant impact on knowledge sharing practices.

5.2. Recommendation

Knowledge sharing is vital component of organizations to be competitive in today's competitive environment. Internally created knowledge by no means is sufficient for organizations to be competitive. Due to this fact, today's organization is looking in to external organizations such as universities in search of knowledge. But, there are different factors that affect the knowledge sharing practices between organizations. Thus, organizations should try to maximize their advantage from knowledge sharing by using

different mechanisms. Some of the factors that affect university- industry knowledge sharing practices are identified as:

- at individual level: lack of time to share knowledge and lack of satisfaction by the existing knowledge sharing strategies; hence, to alleviate strategies should be devised in consultation with academicians and should diminished the time constraint
- at organizational level: lack of motivational schemes for knowledge sharing; lack of budget to create, acquire and share knowledge; lack of regular plan to share knowledge; lack of knowledge sharing platform; to minimize or alienate these challenges, the AAUCVM should provide organizational support by devising motivational schemes to share knowledge, regularity plan to share knowledge and by allocating reasonable budget for knowledge sharing and implement knowledge sharing platforms such as seminars, workshops and conferences regularly;
- At technological dimension: lack of up-to-date ICT; lack of appropriate KMS to share knowledge and the university/college website were not updated regularly. Hence to fill these identified gaps AAUCVM should up-to-date ICT infrastructure to share knowledge, implement appropriated KMS to share knowledge and the university/college ICT sections should regularly update the website and make reach in content.

5.3. Limitations of the study and future research directions

- This research was focused on a single college of Addis Ababa University and only from the perspective of the college. However, conducting research in all colleges and institutions of Addis Ababa University may help to have a broader understanding about the university-industry KS practices of AAU. Thus, it is recommended to conduct further research by considering all colleges and institutions of AAU and including samples from industry stakeholders.
- This research also focused on some variables that affect KS practices. Hence, further research should be conducted on other variables to provide greater reliability to research findings in the area.

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Appendix A:

Addis Ababa University College of Natural and Computational Sciences Department of
Information Science

Survey Instrument

Dear Respondents,

This questionnaire is designed to collect data for a research on “Factors Affecting university-Industry Knowledge Sharing Practices: The Case of Addis Ababa University College of Veterinary Medicine and Agriculture”. The data will be used to undertake research for master’s thesis in Information Science in the Department of Information Science at Addis Ababa University.

Your responses will be strictly kept confidential and individual participants will not be identified in any part of the research. The researcher will not also use the data for other purposes other than the intended aim of this research. Your answer is very important for the success of this study and it is highly appreciated. I kindly request you to carefully read all the questions and give your genuine answers based on your awareness of the present condition at your University/College.

Thank you for your participation!

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Part I: Respondents’ profile

1. Your Gender A. Male B. Female
2. Your age group:
 - A. Less than 23 years
 - B. 23-30 years
 - C. 31-40 years
 - D. 41-50 years
 - E. Above 50
3. Your higher Level of Education:
 - F. DVM/ BSc/BA
 - G. MSc/MVSc
 - H. PhD

- I. Others, if any please specify _____
4. Your Academic Rank:
- A. Lecturer
 - B. Assistant Professor
 - C. Associate Professor
 - D. Professor
 - E. Others, if any please specify _____

5. Your Department:

- A. Animal Production
- B. Biomedical Sciences
- C. Clinical Studies
- D. Parasitology and Pathology
- E. Veterinary Microbiology and Public Health

6. Your experience in higher institution(s)

- A. Less than 3 years
- B. 3-10 years
- C. above 10 years

Part II: Knowledge Sharing practices

How frequently engaged in the following knowledge sharing activities with industry stakeholders (Please put "X" on your choice.	Never	Rarely	Sometimes	Often	Always
1. Training company's' employees through teaching or personnel exchange					
2. Attending conferences which have participation by individuals from stakeholder organizations					
3. Participation in standard setting forums involving stakeholder organizations					

How frequently engaged in the following knowledge sharing activities with industry stakeholders (Please put "X" on your choice.	Never	Rarely	Sometimes	Often	Always
4.Participating in personal networks involving stakeholder organizations					
5.Personal contacts via membership of professional organizations					
6.Giving invited lectures or participating in brainstorming sessions organized by stakeholder organizations					
7. Organizing the hosting of personnel from stakeholder organizations on short-term or long-term basis					
8.Joint research with stakeholder organizations(original work undertaken by both parties)					
9.Contract research with stakeholder organizations(original work undertaken only by academic partner only)					
10.Consultancy services(no original research undertaken)					
11.Providing informal advice on a noncommercial basis to stakeholder organizations					
12.Setting up new facilities with funding from stakeholder organizations					
13.Joint publications with individuals of stakeholder organizations					

III. Motivation for knowledge sharing

Please indicate your level of agreement on your motivation and objective to participate in knowledge sharing activities with stakeholder organizations. My motivation is to:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14. Test the practical applicability of my research					
15. Secure access by researchers to specialist equipment, material or data					
16. Secure access to expertise researchers at the stakeholder organization					
17. Gain knowledge about practical problems and knowledge application					
18. Create student project and job placement opportunity					
19. Secure funding for research					
20. Look to business opportunities linked to my own research					
21. Supports my university's/college's outreach mission					

III. Factors Affecting University-Industry Knowledge sharing practices

Indicate your level of agreement on the following statements of knowledge sharing factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
A. Individual knowledge sharing Factors					
1. I am willing to share knowledge to industry stakeholders					
2. I am satisfied by the existing knowledge sharing strategies with industry stakeholders					
3. I trust to share knowledge with industry stakeholders					
4. I am highly motivated to share knowledge to industry stakeholders					

Indicate your level of agreement on the following statements of knowledge sharing factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5.I know that sharing knowledge is one of my duties					
B. Organizational knowledge sharing factors					
1.There is motivational schemes by my college/university to encourage knowledge sharing to outside the college/university					
2. My university supports career development to encourage knowledge sharing					
3. Academic and administrative promotions help improve knowledge sharing practices					
4. In my college/university there is a specific budget dedicated to acquire, and share knowledge.					
5. In my college/university there is periodic plan to acquire, organize and share knowledge					
6. My college/ University facilitates knowledge sharing platforms (workshops, seminars, etc.) on a regular basis					
7.My university/college has a policy or strategy for research communication and dissemination					
C. Technological Factors					
1.My college/university has a very up-to-date ICT infrastructure that enable to share knowledge					
2. My college/university use appropriate knowledge management system to share knowledge					
3. My college/university utilize Intranet and Internet to share knowledge					
4.My college/university website updated regularly to share knowledge					

Appendix B: Interview Questions

This interview questions are prepared to collect relevant data to explore the factors affecting university-industry knowledge sharing practices: The case of Addis Ababa University College of Veterinary Medicine. Therefore, you are kindly requested to provide as accurate and recent information as possible.

Your cooperation on the interview would be highly appreciated!

Knowledge Sharing Practice

1. How knowledge is managed/ shared among departments in university/college?
2. Do you think that your College has formal knowledge sharing mechanism with the industry stakeholders?
3. Can you mention those knowledge sharing mechanisms?
4. Have you ever participated in dialogue forums, trainings, workshops, Seminars, exhibitions and trade fairs organized by University/college and stakeholder organization? If your answer is yes, please explain the benefits that you brought to your University/college.
5. To what extent knowledge created by your College applied by industry stakeholders?
6. Can you mention practical examples of knowledge applied from your College
7. Is there any knowledge sharing policy and strategy in your university/college??
8. What are the challenges in university and industry knowledge sharing at present time?