A COGNITIVE LINGUISTIC APPROACH TO THE STUDY OF METAPHORS IN THE LANGUAGE OF COMPUTER HARDWARE AND SOFTWARE

JOSHUA MBOGHA ONDU, MBA, B.Ed
C50/24455/2013

A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF HUMANITIES AND SOCIAL SCIENCES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS OF KENYATTA UNIVERSITY

NOVEMBER 2018

DECLARATION

This project is my original work and has not been presented for the award of a degree in any university.

Signature …… Date ……

Joshua Mbogha Ondu (Registration No. C50/24455/2013)

SUPERVISORS:

This project has been submitted for review with our approval as university supervisors.

Signature ……. Date ……

Dr. Mwangi Gachara

Lecturer, Department of English and Linguistics

Kenyatta University

Signature ……. Date …….....

Dr. Emily Ogutu

Senior Lecturer, Department of English and Linguistics

Kenyatta University

DEDICATION

This project is dedicated to my precious and beautiful wife, Jane, who was a source of inspiration during the course of this study; and our blessings Janiella Imela and Jeovanna Favour who gave me a reason and hope that ensured that this work was done to its successful conclusion.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank the Almighty God for His love and grace and for being with me throughout the period of the study. He gave me the strength to finish this project.

Special mention goes to my supervisors, Dr. Mwangi Gachara and Dr. Emily Ogutu for their guidance, positive criticisms and provision of direction during the writing of this project.

I would also like to thank my precious wife, Jane Amunga and our blessings, Janiella Imella Mbogha and Jeovanna Favour Mbogha for their support, encouragement and prayers during the entire period of the study.

I cannot forget to thank my beloved parents, Mr. Boaz Ondu and Mrs. Ruth Ondu and my siblings Jemima, Lillian, Duncan, Wycliffe, Erick, Evans and Victor. Thank you all for your support, encouragement and prayers.

I also cannot fail to mention Dr. Joshua Wachira Tumuti of Kenyatta University and Dr. Wilberforce Senelwa Anaya of Jomo Kenyatta University of Agriculture and Technology (JKUAT) for their insights, prayers, encouragement and support.

Finally, I would like to thank the respondents both from IAT and Kenyatta University and especially Mr. Edwin Atitwa who helped with crucial insights during the analysis.

ABSTRACT

The study is a cognitive approach to the analysis of metaphorical expressions that are used in computers. Cognitive scientists have noted the important role of prior knowledge in acquiring new knowledge. Computers have relied on the use of existing language to name its different concepts. These concepts have been presented in metaphorical ways which is the basis for this study. The study identified the metaphorical expressions used in computers. The objectives of the study entailed the analysis of computer metaphors in terms of the target and source domains; identification and analysis of computer metaphors that were successful and those that were unsuccessful in relating to the real life language use, and finally the identification of cases of misinterpretation of expressions used in computers. The theory used in the study was the Conceptual Metaphor Theory. A computer consists of hardware and software. With regards to software, the study focused on Operating System and Application Software. Data was obtained from 20 online computer articles where metaphorical expressions were identified using a procedure known as the Metaphor Identification Procedure *Vrije Universiteit*, Amsterdam (MIPVU). The researcher identified 10 expressions each from computer hardware and computer software. A questionnaire was issued to 50 respondents who included students and lecturers. The respondents were drawn from two selected educational institutions where 25 were sampled from the Institute of Advanced Technology in Nairobi (IAT) and a similar number from Kenyatta University (KU), Main Campus. The researcher used both qualitative and quantitative research designs as well as the descriptive research design. In terms of the sampling design, the researcher used the Stratified Random Sampling and purposive sampling. Consequently, the findings and the analysis of the study were presented using figures and tables. SPSS was used for the analysis of the data for the third objective. The study noted that the Conceptual Metaphor Theory was applicable in the analysis and description of metaphors in computers in terms of their target and source domains. The analysis was done in a uni-directional way as well as in a one-to-one fashion where the mappings were done from the source domain to the target domain. This is the principle governing the analysis of metaphors using the Conceptual Metaphor Theory. The findings showed that there were a number of metaphors which were successful and those which were not successful in relation to how the concepts were close to the words in real language use or not. The *Port, Plug* and *Play, Host* and *Repeater* metaphors were classified as unsuccessful while the rest were successful. The researcher during the analysis, noted that there were cases of misinterpretations of expressions. These misinterpretations lead to lots of confusion amongst users if they do not relate the concepts at hand to the contexts in which they are used. In terms of the metaphors which were analyzed as misinterpreted, the *bus* and *card* metaphors had 26.7% each of the responses, *repeater* had 26.6%, and the *processor*, *window* and *sleep* metaphors had a response rate of 20.0% in each

case. The study is intended to contribute to the development of metaphors in the area of cognitive linguistics and the linguistic theory. It will also contribute to the studies on language in technology. The researcher recommends that a study should be done to ascertain if all the words, phrases and expressions used in computer hardware and software are metaphorical or if some are not. Further research should be done on how metaphors have been used in the other areas in ICT such as internet, networking, programming and databases. Finally, a study should be done to ascertain and analyze how metaphors have been used in the social media in the areas such as Twitter, Telegram, Facebook, WhatsApp, Instagram, amongst others.

ABBREVIATIONS AND ACRONYMS

ATM	Automated Teller Machine
BIOS	Basic Input Output System
BT	Blending Theory
CDA	Critical Discourse Analysis
CL	Cognitive Linguistics
CMA	Critical Metaphor Analysis
CMT	Conceptual Metaphor Theory
CPU	Central Processing Unit
DVD	Digital Versatile Disk
GUI	Graphical User Interface
IAT	Institute of Advanced Technology
ICT	Information Communication and Technology
IDRC	International Development Research Centre
IT	Information Technology
KU	Kenyatta University
Mfag	Metaphor flag
MIP	Metaphor Identification Procedure
MIPVU	Metaphor Identification Procedure *Vrije Universiteit*
MRW	Metaphor Related Words
PCI	Peripheral Component Interconnect

PDF	Portable Document Format
ROM	Read Only Memory
SD	Source Domain
SIM	Subscriber Identity Module
SPSS	Statistical Package for Social Scientists
TD	Target Domain
USB	Universal Serial Bus
VGA	Video Graphics Adapter

OPERATIONAL DEFINITIONS OF TERMS

Cognitive Linguistics:

An approach to language that is based on people's experiences of abstract phenomena and the way they perceive and conceptualize them.

Computer:

This refers to a machine that stores programs and information in electronic form and that can be used for a variety of processes, for example, writing, calculating and communicating on the internet.

Computer Hardware:

This refers to the physical components or parts of a computer that are tangible**.**

Computer Software:

This refers to the applications or programs that the computer uses to function and that are intangible.

Mapping:

A set showing the relations between the concepts and categories of correspondences from the source domain to the target domain.

Metaphor: It is a notion where one concept is expressed in terms of something else.

Source Domain:

This represents the concept attributed to the one being talked about.

Target Domain:

This refers to the concept that is being talked about.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter discusses the background to the study, statement of the problem, objectives of the study, research questions, research assumptions, justification and significance as well as the scope and limitations of the study.

1.1 Background to the Study

The study of metaphors can be traced back to the period of Aristotle. The studies then, looked at different areas such as cognition amongst others. Scholars like Lakoff and Johnson (2003) and Fauconnier and Turner (2002) share the view that metaphors are based on what they call analogy and that in the study of metaphors, one concept is normally looked at in relation to the properties of another concept. Wilkinson (2002) records that a metaphor is a notion where one concept is expressed in terms of something else.

Researchers in metaphor studies are of the opinion that metaphors consist of two meanings. They say that someone needs to know the literal meaning to help them understand or know the metaphorical meaning. Metaphors are products of polysemy. Murphy (2010) notes that polysemy refers to a situation where one word is associated with two or more distinct meanings.

White (2001) defines a computer as a machine that stores programs and information in electronic form and that can be used for a variety of processes, for example, writing, calculating and communicating on the internet. He defines hardware as computer equipment or the physical parts of a computer while software as the programs that the computer uses to function. In other words, hardware is a part of a computer that is tangible while software is not.

Barr (2003) remarks that despite the fact that computers fall under the category of the devices that are difficult to understand and operate, many people use them almost every day and will continue to use them for years to come. He continues to say that despite the fact that people have different levels of expertise and experience when it comes to using computers, they must use them to accomplish some tasks in their line of duties. Users therefore tend to use metaphors in order to understand the different concepts. He gives an example of a computer '*memory'*. He describes the "*memory*" as a hardware component which is located in the computer and adds that "*memory*" is a metaphor since it stores data. In the ordinary language, *memory* refers to a person's ability to encode, store, retain and recall information and experiences that took place in the past.

According to Peter (1997), metaphors are used to a great extent to help users easily understand the concepts in computers and that it is impossible to talk about computers without making reference to the powerful tool that lies in metaphors.

He continues to add that metaphors are also used whenever new technologies emerge to address the complexity of the issues.

Barr (2003) and Peter (1997) however note that some users have experienced challenges of misinterpretation of the concepts used in computers from their literal meaning to their contextual meaning. For example, a trainer in computers can ask his students to close the windows after the class is over. The reaction of some students will entail closing the physical windows that are part of the class (building) whilst the trainer meant the windows in the computer, sometimes refered to as programs. This misinterpretations leads to lots of confusion amongst users if they do not relate the concepts to the contexts in which they are used.

Indurkhya (1992) notes that the language used in computers as well as in software development is sometimes characterized by the usage of metaphors. He defines metaphor as "a description of an object or event, real or imagined, using concepts that cannot be applied to the object or event in a conventional way" (p. 18). He adds that terms such as *shopping carts, folders, directories* and *files* have been included in the language of computers. Other examples that he gives are *clients, servers* and *daemons* which are concepts that relate to system software, sometimes known as operating systems.

Indurkhya (1992) further says that many of the computer metaphors enumerated name abstractions in people's senses. The abstraction is used so that the

information given by the terms could be hidden. He concludes that the creation of similarity is a cognitive problem: "How is it that an object can be conceptualized differently, with new attributes and structures being created, but this creation is not arbitrary?" (p. 90). The treatment of metaphors, therefore, as discussed by Indurkhya focuses on the analysis of metaphors from the cognitive point of view which is the focus of the study.

1.2 Statement of the Problem

The invention of technology and specifically computers, has led to the usage of many words from the English language in the domain of computers. Many people use computers in one way or the other and to some extent computers have become part and parcel of their daily lives. The manufacturers of both computer hardware and software use words of a language to describe or name concepts. The words that the manufacturers use to name concepts are often misinterpreted especially by those who are not conversant with computers. This is because there are numerous metaphors that are used and whose interpretations are not clear unless one investigates them further.

An expression such as '*the driver is corrupt'* can be interpreted literally. It can also be looked at from the context of a computer that makes it be considered as a metaphorical expression. This then, can be analyzed using the conceptual metaphor theory. In the analysis of the metaphors, the study analyzed the metaphors that were successful in the way they relate the concepts to the real

world and the ones which were not. The concepts which had a closer or similar meaning both from the literal and metaphorical usage were considered as successful while those which presented clear differences were considered unsuccessful. The implication of this is that a successful metaphor enables a user to relate its meanings from the literal usage as well as its usage in computers without lots of confusion while the unsuccessful ones cause lots of confusion as well as misinterpretations, where a user can take a concept to mean something which when analysed is not the case. This study therefore sought to analyze a selection of metaphorical expressions used in computers using the Conceptual Metaphor Theory.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of the study was to examine the Cognitive Linguistic Approach to the study of metaphors in the language of computer hardware and software.

1.3.2 Specific Objectives

The specific objectives of the study were to:

1. Analyze computer metaphors in terms of the target and source domains.
2. Identify and analyze computer metaphors that are successful and those that are unsuccessful in relating to the real life language use.
3. Identify the cases of misinterpretation of expressions used in computers.

1.4 Research Questions

The study sought to answer the following questions:

1. How are computer metaphors analyzed in terms of the target and source domains?
2. Which computer metaphors are successful and which ones are unsuccessful in relating to the real life language use?
3. What are the cases of misinterpretation of expressions used in computers?

1.5 Research Assumptions

The study was guided by the following assumptions:

1. Computer metaphors can be analyzed in terms of the target and source domains.
2. There are computer metaphors that are successful and those that are unsuccessful in relating to the real life language use.
3. There may be cases of misinterpretation of expressions used in computers.

1.6 Justification and Significance of the Study

Most of the researches in metaphors have not looked at metaphors in computers extensively and especially from a linguistic point of view. The study therefore sought to analyze selected metaphorical expressions from a Cognitive Linguistic Approach. In this regard, the research is intended to add to the existing knowledge on metaphors in relation to the concepts in the area of computers.

Many people use computers and therefore the analysis and findings of the research is supposed to make it easier for them to understand the computer language. This is because of the analysis that provides the information that defines and discusses the words as used in computers.

Computer designers and manufacturers rely on language when it comes to naming of concepts. The research will bring to the fore the role of language in the area of computers. As technology advances, more concepts are being created in the form of metaphors. Developers and manufacturers in technology and computers will therefore continue to rely on language to generate the concepts or names used in computers. It is intended that the findings of this study will be used by the developers to aid them in knowing which terms were problematic to the users so that in their future innovations and developments, they try to use more and more concepts from the environment and those that users can easily relate with.

The study seeks to contribute to the field of metaphor studies and is supposed to be of benefit to teachers. It will help the teachers to appreciate the fact that the language used in computer is laced with metaphors and therefore the need to know how to interpret them both in the normal usage and from the context of a computer.

The curriculum designers of computer related programmes will also benefit by ensuring that the work they produce in relation to computers explain the different computer terminologies in a language that the intended users and beneficiaries can understand.

Scholars in the area of metaphors will benefit from the analysis and the concepts generated in this study and will help them to explore this area which is considered technical especially from the context of its relationship to the study of languages.

The policy makers in ICT and the government will benefit when coming up with the curriculum in ICT studies. Kenya Institute of Curriculum Development (KICD), for instance, during the designing of the materials for teaching Computer Studies, can develop courses with the knowledge that computer terminologies are metaphorical. This is abound to encourage them to come up with an easier way of bringing out the concepts and even provide a glossary where the computer terminologies are explained for the benefit of the users.

1.7 Scope and Limitations of the Study

This study falls under the area of Cognitive Linguistics. A study in computers can focus on different areas such as networking, security, internet, programming, databases among others. This study was limited only on the metaphorical expressions used in computer hardware and software. The researcher did an

analysis only on a selected number of metaphorical expressions as used in computers.

The researcher is an average user of computers and not an expert. This was a limitation though the researcher surmounted this hurdle by reading and researching in the area of computers. The researcher also sought guidance from those versed in the area of computers who gave insights that helped in the study and its related analysis.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction

This chapter looks at the review of related literature on studies related to the use of metaphors, metaphors in Africa and metaphors in computers. It also addresses the methods of identifying metaphors as well as the theories related to metaphors such as the Blending Theory and the Class - Inclusion Theory. Finally, the Theoretical Framework with specific reference to the Conceptual Metaphor Theory and the analysis of data using the Theory are discussed.

2.1 Studies Related to the Use of Metaphors

According to Griffiths (2006), the figurative use of a literal term is called a metaphor (in linguistics as in literary studies). Metaphors are useful because they allow us to use known literal terms for concepts which may be less known or less tangible but which are parallel to the known terms. For instance, *the foot of the mountain* is a figurative use of *foot* which symbolises the lower end of the mountain just as *the brow of the hill* shows *brow* in a figurative use to indicate the top ridge of a hill. Griffiths (2006) continues to assert that metaphors tend to provoke thought and feeling to a greater extent than more literal descriptions do.

Gentner and Bowdle (2005) are of the opinion that when a metaphor is used for the very first time, it is viewed as new. But as people continue using the said metaphor, it becomes part and parcel of the new lexical item in that language. They illustrate the Career of Metaphor Theory which traces the path from the time a metaphor is born, young and brilliant to the time it dies.

Glucksberg and Gildea (1983) assert that the understanding of a new metaphor is dependent on the relevance and the fact that a metaphor is informative. In terms of computers, users tend to relate what they know to the metaphor in question, for example, "the computer driver is corrupt". This suggests that there is something negative or an issue that is bound to affect the normal operations of the computer and its associated devices.

Semino (2008) remarks that metaphors are often used as tools of persuasion for their potential to arouse emotions in people and for relating new information to familiar information. She brings the concept of conventional metaphors which she describes as phrases that originally were used metaphorically, but over the course of time have turned literal. To illustrate a conventional metaphor, Semino (2008) uses the noun "crossroads". Conventionally, the word is used as a metaphor for situations where a decision has to be made, for example, "I'm at a crossroads: should I get married or not?" This also ties in with the definition found in the Macmillan Dictionary Online, where being at a crossroads is defined as "to be at a stage in your life when you have to make a very important decision"

(macmillandictionary.com, 2010). This highlights another aspect of a conventional linguistic metaphor, that is, its meaning is normally included in dictionaries alongside the non-metaphorical meaning – in this case, a place where two roads cross.

2.2 Studies Related to Metaphors in Kenya

Kobia (2008) did a study on how metaphors are applicable in conversations where he researched on the conversations on Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS). This was amongst the *Oluluyia* speakers who are found in Western Kenya. He notes that the metaphors used in HIV/AIDS brought to the fore its roles including cautioning the members of the community, persuading them, informing them and cautioning them so that they can change their behavior. The metaphor of *khumulilu* (FIRE) that is used amongst the *Oluluyia* speakers, for example, provides an image of DESTRUCTION or DANGER and is used to caution the members of the community against engaging in sex in a careless manner. This metaphor is closely linked to the contribution of the cognitive nature of metaphors which allows the users to conceive the world (Lakofff and Johnson, 1980). His research is relevant to the current study since it is noted that the facets of metaphors such as production, construction and deconstruction are found within the confines of the social, physical and cultural environment of its speakers. His study also sought to identify, analyze and decode utterances; metaphors and myths used by the speakers in relation to HIV/AIDs

discourse. This study is similar to the current study which sought to identify metaphors and looked into areas of misinterpretations of expressions which are related in dimensions to the myths that Kobia investigated. His study also focused on mappings which is similar with the analysis of this study. Kobia used two theories; that is, Critical Discourse Analysis and Critical Metaphor Analysis in his study while the current study employs CMT. The gap that was intended to be filled was to show how CMT is applicable in the analysis of metaphors and especially, with regard to the analysis of the metaphors in terms of their target and source domains and whether the metaphor is successful or not.

Gachara (2012) did a study on the metaphors of *Gĩkũyũ* marriage negotiations where he used the Career of Metaphor Theory. His study looked at the metaphors from a cognitive linguistics point of view which is similar to the approach taken in this study. Gachara used the MIPVU procedure to determine the lexical items that were metaphorical. Gachara's research is relevant to the current study since it identified and classified metaphors and also used the MIPVU to identify the metaphorical items. However, the study is different from the current study since unlike Gachara's study deals with issues of marriage and the associated conversations in relationships, the current study deals with technological phenomenon in the area of computers. The gap to be filled was that, while Gachara's work identified metaphors, described and analyzed them in terms of their linguistic forms and conceptual structures, the current study sought to address

the metaphors in terms of their target and source domains as well as misinterpretations and the aspect of how successful or not the metaphors are.

Gathigia (2014) did a study on the metaphors of love in *Gĩkũyũ*. His study is similar to the current study with regard to the adoption of the CMT where he identified and described the conceptual mappings of the love metaphors with regard to the SD and the TD. He sought to find out the semantic and lexical processes involved in the creation of *Gĩkũyũ* euphemisms as well as the influence of gender in the usage of euphemisms in the said language. His work involved gathering the metaphors in the *Gĩkũyũ* language, translating them into the English language and then mapping them into the target and source domains. The gap that this study seeks to fill is to show the misinterpretations of metaphors in computers as well as the notion of whether the metaphors are easy to relate in the real life or not.

Orwenjo (2010) on the other hand did a study on metaphors of politics in Kenya where he focused on the patterns of metaphorical language that were used by politicians during the constitutional referendum campaigns in 2005 and the general election campaigns in 2007. The study found out that metaphors were used by politicians to manipulate the electorate in terms of their emotions which in some instances led to non-linguistic consequences such as violence. He used the Metaphor Power Model (De Landtsheer, 1994) and the Crisis Combination

Communication Theory (CCCT) (De Landsheer and De Virji, 2004) though he used the CDA as his main theory. He used it in the identification and analysis of the intentions and ideologies in the context of language use. The study is relevant to this study since it goes a long way to show that metaphors can be used in different discourses in linguistics. His study is from the political discourse. His work gave a view that metaphor is a key facet of language and cognition and that metaphor helps us to understand concepts. The gap that the study sought to fill was the misinterpretations that come with the usage of metaphors in expressions. Orwenjo's study does not analyze the misrepresentations and misquotations that are prevalent in political discourses. This study analyzed the misrepresentations in the metaphors used in computers.

2.3 Studies Related to Metaphors in Africa

Machakanja (2006) notes that studies on metaphors with regard to the Cognitive Linguistics perspective in the African languages have not been extensive. There are some scholars, however, who have done research in this area.

Mensah (2012) did a study in which he examines the metaphors in the political speeches from Ghanaian politicians. He sighted an example where a politician by the name Teye Nyaumu gave a speech referring to the then president, Professor John Evans Atta-Mills as a driver of a *Yutong* bus who was not driving the bus well and therefore was supposed to pave way to a new driver. He argued that if a

new driver was not found, then the bus would veer off the road and possibly kill the passengers. This was a negative source mapping according to Mensah. On the other hand, the then Vice President John Mahama used the same metaphor to defend the president saying that he was the best driver. This was a positive source mapping. Because of these utterances from the government and the opposition, a discussion of the *Yutong* bus driver metaphor emerged amongst the media analysts and political commentators. His study noted that politicians manipulated the metaphors during their speeches so as to achieve a positive rhetorical mileage.

His study is similar with the current study since it was done under the cognitive linguistics approach. The study also employed the CMT which was adopted in this study. This is important for the current study since in enabled the researcher to get an understanding on how the theory has been effective in the discussions and analysis of abstract concepts. Mensah's study emphasized the role of the source domain in the analysis of metaphor where he noted that the source domain had a positive and negative association which in the political discourse could eventually become a natural part of source domain. His study did not expressly address cases of misrepresentations of the metaphors. The current study sought to fill the gap by addressing the misinterpretations of expressions.

Ansah (2010) uses the Conceptual Metaphor Theory to examine the role of culture in conceptualizing two concepts, that is, *Anger is a hot fluid in a Container* and

Love/ Relationship is a journey in English. He finds that the concept of LOVE in Akan can be conceptualized as a JOURNEY. This study is relevant to the current study since it looks at a concept from two perspectives, that is, the source and target domains. The departing area is that while Ansah uses focus group discussions to get data for his analysis, this study employs the usage of questionnaire in collecting the data from the respondents. The current study also focuses on the successfulness of the metaphors as well as misinterpretations.

2.4 Studies Related to Metaphors in Computers

According to Boyd (2012), metaphors are omnipresent in science and by extension, in computers. He says that many of the metaphors have primarily been introduced for explanatory purposes. A number of programs that have been designed to offer users an easy experience have a platform from where users can do their work in the computer. This has been discussed by the example of a *screen* with the *desktop* being the first thing that a user encounters when they start their computers.

Faber (2012) says that metaphor is a valuable tool in the field of software design. According to her, IT as a field is rife with metaphors. She says that electronic mail (e-mail) and its accompanying desktop items are obvious examples. E-mail is sent over the internet or the information superhighway.

Fineman (2004) adds that metaphors help users understand software programs and are largely based on the interaction between humans and computers. He remarks that besides being a way of generating new terminology, such metaphors are instrumental in the creation of a user- friendly product.

2.5 Methods of Identifying Metaphors

Metaphor identification in real discourse has been a key development lately. Steen *et* al. (2010) remark that metaphor identification is a scientific measurement which ensures that metaphors are measured in an accurate manner.

Many methods have been proposed for the identification of metaphors. Scholars like Berber (2006) and Mason (2004) remarked that great progress had been made to develop programmes that were to be used to identify metaphors in an automatic way but noted that most of the methods focused more on the manual analysis of the data.

One of the methods was proposed by Barlow, Kerlin and Pollio (1971) who came up with a training manual that was to guide the identification of figurative language in a number of contexts from the basic compositions by children to speeches by politicians. Their manual provided brief explanations of similes, irony, personification and metonymy alongside the linguistic examples that were appropriate for each type. This approach was not used in this study since it had a

weakness of failing to provide a clear way for determining whether a word or phrase is metaphorically used or not as noted by Steen *et* al. (2010).

The researcher used the Metaphor Identification Procedure *Vrije Universiteit* (MIPVU) in this study. MIPVU is an improved version of the Metaphor Identification Procedure (MIP). Steen *et* al. (2010) noted that MIPVU is a research tool that is used to identify words that are considered as conveying the meanings of metaphors with regard to how they are used in a given context. MIPVU was used since it was found to be an effective and reliable procedure for metaphor identification. The procedure was also found to be the best since it was an optimized and improved version of the Pragglejaz Groups' procedure of the earlier version known as the Metaphor Identification Procedure (MIP) (Steen *et* al., 2010). A number of scholars used it in their studies to identify metaphors in both spoken and written discourses. For example, Gachara (2012) used the procedure in his work on metaphors of *Gĩkũyũ* marriage negotiations.

2.6 Theoretical Framework

2.6.1 Conceptual Metaphor Theory

This study is based on the Conceptual Metaphor Theory (CMT). The Conceptual Metaphor Theory was advanced by Lakoff and Johnson. Lakoff and Johnson (2003) while addressing the theory, note that the basic view of metaphor in

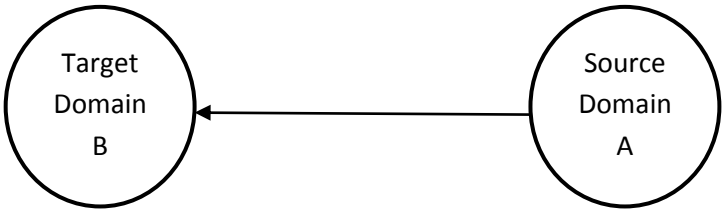
cognitive linguistics is: "*The essence of metaphor is understanding and experiencing one kind of thing in terms of another*" (Lakoff and Johnson, 2003, p.5)".

Lakoff and Johnson (2003) introduce the view that metaphor might not only be concerned with language, but also about the way we think. Indeed, they suggested that making metaphors is a cognitive process and is something that the human brain does naturally. The Conceptual Metaphor Theory posits that human thoughts are shaped or framed by metaphors. Lakoff and Johnson (2003) remark that the human brain works by relating new knowledge to old, and are constantly looking at things as if they were other things. When a human being encounters something new, he asks himself "have I seen something like this before?" The model that Lakoff and Johnson proposed suggested that the whole way the humans understand and relate to the world is metaphorical, and that linguistic metaphor is just a surface reflection of the deep level of cross-domain linking that happens in the human mind.

Lakoff and Johnson (2003) note that the Conceptual Metaphor Theory involves a cross domain mapping where two conceptual domains are involved: the target domain and the source domain. Lakoff and Johnson (2003) define the *target domain* as the concept that is being talked about while the *source domain* represents the concept attributed to the one being talked about. They further add that the source domain corresponds to the target domain. The target domain *X* is

understood in terms of the source domain *Y*. For example, in the metaphor, *life is a journey*; *life* is the target domain while *journey* is the source domain. This tenet of target and source domain is useful in the analysis of the data since it addresses the first objective of the study. Each of the metaphorical expressions were analyzed in terms of the source and target domains.

The diagram below shows the relationship between the target domain and the source domain:



Life is a journey

Figure 2.1: The Two- Domain mapping Structure of Conceptual Metaphor adapted from Lakoff and Turner (1989).

Lakoff and Turner (1989) observe that the conceptual metaphor, *life is a journey*, can be analyzed in terms of the abstract concept of *life* which is manifested in terms of a physical travel or *journey*. This manifestation can be looked at in terms of a cross domain mapping which in turn leads to expressions or utterances such as *taking a wrong turn, coming a long way, having a rough road ahead, being without direction in life, being at a crossroads in life, getting a head start in life* amongst others. When it comes to interpretations, they remark that conventional

mappings that relate with this metaphor enables people to require little contextual meanings to understand utterances like taking a wrong turn or getting back on track. These are associated with the concepts and attributes of *life* and that of *journey*.

In summary, the Conceptual Metaphor Theory was used as the preferred theoretical framework since it enabled the mapping of the source domain to the target domain. The conceptual metaphors of computer hardware and software provided the cognitive grounds for various cross domain mappings. Lakoff and Johnson (2003) define conceptual metaphor as a metaphor or figurative comparison where one idea is understood in terms of another idea. One of the objectives of the study was to analyze the selected metaphorical expressions in terms of the target and source domain.

The theory has been used by several scholars to analyze metaphors in their works. Mensah (2012) and Gathigia (2014) used the Conceptual Metaphor Theory in their studies which involved conceptualizations and therefore mappings in terms of the source and target domains.

Furthermore, scholars like Kövecses (1986 and 2002), Lakoff and Turner (1989), Turner (1996) and Obeng (1997) note that the Conceptual Metaphor Theory is a

very productive theoretical framework for analyzing metaphors from the cognitive linguistics perspective which is the focus of this study.

2.6.2 Theories Related to Metaphors

This section discusses some of the theories that are related to studies in metaphors.

2.6.2.1 Blending Theory

The Blending Theory (BT) is also known as the Conceptual Integration Theory (CIT). It was advanced by Fauconnier and Turner (2002). It is the theory that replaced the two conceptual domains with at least four conceptual *spaces*. Radden and Dirven (2007) define a conceptual domain as a general field to which a category or frame belongs in a given situation. They gave an example of a knife which they said belongs to two domains. The first domain is the one for '*eating'* when the knife is used for cutting something like bread and secondly the domain of '*fighting'* when the knife is used as a weapon. Fauconnier and Turner (2002) note that two of the four spaces correspond to the source and target domains in the classic model while the remaining two other spaces capture the common ground between the two spaces, that is the generic space and the emerging structure deriving from the mapping in context, what is referred to as the *blended space*.

This theory was not adopted because while Conceptual Metaphor Theory allows for analysis of metaphors on two domains, that is, source and target, the Blending Theory allows for more (four mental spaces) and focuses more on the mental

space as opposed to the domain. One of the objectives of this study was to analyze the metaphorical expressions from the perspective of source and target domains. It is also important to note that the Conceptual Metaphor Theory analyzes metaphors from a directional point of view while the Blending Theory does not. The study sought to analyze the metaphorical expressions from a directional point of view. Gibbs (2000) criticized this theory arguing that the idea of having four blended spaces leads to ambiguities in the analysis of metaphors and that most of the metaphors could be interpreted in an easier way without the need for the four spaces. Gachara (2012) in his study also noted that most of the data used by Fauconnier and Turner (2002) were imagined and that they had failed to look into the different functions of the diverging linguistic forms in discourse.

2.6.2.2 Class - Inclusion Theory

The theory was advanced by Glucksberg and McGlone (1999) and addresses metaphors in terms of the target category for the topic term, a source category for the vehicle term and a superordinate category which is exemplified by the vehicle. In the example, *man is a wolf*, the term *man* is the topic term (target category), *wolf* is the vehicle term (source category). The vehicle is shown by the illustration between *man* and *wolf*, such as a man being aggressive, a man being reckless, amongst others. Glucksberg and McGlone (1999) note that the source category is an example of the superordinate category. In the theory, the discussions of

metaphors are denoted by the term *categories* as opposed to the term *domains* that are used by Lakoff and Johnson (2003) and *spaces* as used by Fauconnier and Turner (2002). This theory discusses metaphor from three fronts or categories which is different from the objectives of this study which focused on two areas being the target and source domains. It is because of this that this theory was not applicable for this study.

2.7 Analysis of Data using the Conceptual Metaphor Theory

With regard to the analysis of the data, Conceptual Metaphor Theory was very significant and relevant since it was applied in the discussion of the mapping of the source domain of the metaphorical expressions to their target domains which was one of the objectives of the study.

The term ‘source’ is explained as the concept that is used to express an idea for it to be understood or interpreted in terms of another concept that is known as the target domain. According to Lakoff and Johnson (2003), the metaphorical mapping can sometimes be done in a uni-directional way. In other words, the mapping is done from the source domain to the target domain. This is the position that was adopted in the analysis of the data in terms of the metaphorical expressions in this study. Scholars like Croft and Cruse (2004) observe that mapping in metaphors can also take different directions, for example, one-to-one, one –to-many, many-to-one and many-to-many. Lakoff and Johnson (2003) assert

that for mapping that involved the usage of the Conceptual Metaphor Theory, then the one to one mapping was the one to be used. The study therefore adopted the one-to-one mapping where the source domain was mapped to the target domain.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter focuses on the research design, the location of the study, the target population, the sampling design, the sampling techniques and the sample size, the research instruments and data collection, data analysis and finally the ethical considerations.

3.1 Research Design

According to Yin (2003), a research design is an action plan that is used to address two issues. The first issue refers to the questions that the respondents are required to answer while the other refers to the answers. The researcher employed the descriptive research design.

Orodho (2003) says that this is a design where a researcher gathers information from respondents by using a questionnaire or by conducting an interview. A questionnaire was used for gathering the information where the respondents gave their views regarding the different issues that the researcher wanted to investigate in line with the objectives of the study. The descriptive study was used to provide a framework of detailed description of the metaphorical expressions used in computers.

With the adoption of a cognitive linguistics approach in this study, the researcher also used qualitative and quantitative research techniques. Mugenda and Mugenda (2003) note that qualitative research produces data that is not numerical in nature and therefore the responses from the respondents are used to interpret and analyze the objectives of the study. The researcher used the non-numerical data to discuss the first and second objectives. The theoretical framework was also put into perspective using the qualitative technique. The quantitative technique which produces data that is numerical in nature, was used to analyse the third objective on the issues of misrepresentations of the concepts.

3.2 Location of the Study

The study was conducted in two selected educational institutions where it was noted by the researcher that ICT was integrated in both teaching and learning. The study was therefore carried out at the Institute of Advanced Technology (IAT), Town Campus in Nairobi and Kenyatta University, Main Campus. IAT was chosen since it is one of the leading computer tertiary colleges in East and Central Africa. The researcher selected Kenyatta University's Department of Computing and Information Technology. The focus of the study was in computers hence the choice of the department.

3.3 Target Population

Burns and Grove (1997) define the target population as the whole collection of respondents that have the qualities that a researcher is looking for.

The study targeted respondents from the Institute of Advanced Technology and Kenyatta University. The researcher engaged lecturers as well as students.

3.4 Sampling Design and Sample Size

The Stratified Random Sampling was used in this study. According to Kombo and Tromp (2006), this design involves dividing the population into homogeneous subgroups after which the researcher takes a simple random sample in each of the subgroups. The researcher divided the respondents in terms of whether they were students or lecturers.

A sample is a smaller group or sub-group obtained from the accessible population (Mugenda and Mugenda, 1999). Miles and Huberman (1994) remark that a study cannot include everything and that a researcher is not always in a position to research on everything and everyone. The sample size for this study was 50, that is, 25 respondents from each of the two institutions. In each of the institutions, 5 lecturers were sampled while 20 in each of the institutions were students. This view is supported further by Wardhaugh (2006) who notes that in the variationist method that empathizes on social stratification, one can use the education scale to divide the people under study. He adds that ‘an educational scale for example, may

employ the following categories: graduate or professional education; college or university degree; attendance at college or university but no degree; high school graduation; some high school education; and less than seven years of formal education Wardhaugh' (2006, p. 148).

The justification for choosing 50 respondents was in response to what scholars like Ritchie, Lewis and Elam's (2003) claim that samples that are qualitative in nature should often lie under 50. This view was also supported by Rubin (1987) who adds that larger samples had a tendency of leading to saturation levels which are not desirable.

Purposive sampling was also adopted. This is where cases of subjects are hand-picked because they are informative or they possess the required characteristics (Mugenda and Mugenda, 1999). This is what informed the decision to engage the ICT lecturers and students from the two institutions.

3.5 Research Instruments and Data Collection

The researcher used the MIPVU procedure to identify metaphorical expressions from 20 online computer articles. In each article, at least one metaphor in either computer hardware or software was identified. The choice of the articles was necessitated by the fact that they provide a rich source of words and expressions which are relevant for a linguistic study.

In MIPVU, the unit that is used to analyze a metaphor or a metaphorical expression is the word or phrase, for example, screw driver, corrupt memory, amongst others.

According to Steen *et* al. (2010), MIPVU is based on some steps. The initial steps in MIPVU follow the rules of MIP, that is:

1. The contextual meaning of the lexical unit should be identified.

2. The researcher should check if there is a more basic meaning of the lexical unit and if there is, then its identity should be established.

3. One should then determine if the more basic meaning of the lexical unit is sufficiently distinct from the contextual meaning.

4. Examine whether the contextual meaning of the lexical unit can be related to the more basic meaning by some form of similarity.

If steps 2, 3 and 4 can be positively applied to a word, it should be assigned the tag 'MRW, indirect'.

The more extended and refined set of guidelines which form MIPVU are:

1. Identify the words that are metaphorical by analyzing at the text word by word.

2. In case a word is used indirectly such that it may be explained through the cross-domain mapping from a more basic meaning of that word, it should be marked as metaphorically used.

3. If a word is used directly to the extent that it can be explained through cross-domain mapping to a more basic referent or topic in the text, mark the word as direct metaphor (MRW, direct).

4. If a word functions as a signal where a cross-domain mapping is possible, it should be marked as a metaphor flag.

Data collection is “a systemic way of gathering information, which is relevant to the research purpose or questions” (Burns and Grove, 1997, p.383).

A questionnaire was generated to obtain data for the study. This was then issued to 50 respondents to gauge their interpretation of the selected metaphorical expressions.

3.6 Data Analysis

This entailed the analysis of the data from the selected metaphorical expressions in a qualitative and quantitative manner. The researcher then did a cross-domain mapping using the Conceptual Metaphor Theory. The analysis of the interpretation of the metaphors was presented using figures.

The researcher also used SPSS to generate quantitative data which was presented in form of a summarized table. The data produced was used to analyze the responses for the third objective. The researcher also used the Online *Macmillan English Dictionary for Advanced Learners* to explain the terminologies used in computer hardware and software. This was done to help address the objective on misinterpretation.

The interpretations from the respondents were compared with the correct meanings as provided for in the dictionary. Those that were far off were considered to be misinterpreted. Rundell and Fox (2002) note that a dictionary is often necessary to determine the meaning of a word and in most publications that involve the use of MIP and MIPVU, the *Macmillan Dictionary* in combination with its online tool is recommended.

3.7 Ethical Considerations

According to Mugenda and Mugenda (1999), a researcher should be ethical to an extent that they should not harm the respondents in any way. The researcher

informed the respondents the objectives of the study and assured them that the findings of the study were to be used only for academic purposes. They were also assured that high level of confidentiality would be observed.

McNabb (2004) recommends that a researcher should not force the respondents to give information. The researcher ensured that no respondent was forced or coerced to fill the questionnaires since this process was a voluntary one. The researcher noted that there were a number of respondents who left some sections unanswered and the researcher respected their decisions.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

This chapter looks at the analysis and presentation of the findings. The analysis was done using the Conceptual Metaphor Theory. The chapter addresses the metaphors one after the other with regard to the objectives of the study. Firstly, the metaphorical expressions were analyzed in terms of the target and source domains. Secondly, the metaphors were identified and analyzed in terms of those that were successful and those that were unsuccessful in relating to the real life language use. Finally, the researcher identified the cases of misinterpretation of expressions used in computers. The responses from the lecturers as well as those from the students were compared with the ones from the dictionary.

4.1 Explanation of the Analysis of the Objectives and the Findings

The metaphors were identified using the MIPVU procedure. The researcher then generated metaphorical expressions using the identified metaphors. The online *Macmillan English Dictionary for Advanced Learners* was used to explain the metaphorical meanings which are also referred to as the computer meanings. The dictionary was used because according to Rundell and Fox (2002), a dictionary is often necessary to determine the meaning of a word and especially in publications that involve the use of MIP and MIPVU. As such, all the definitions used in this

chapter, whether literal or metaphorical, are according to the Macmillan dictionary. The literal and metaphorical meanings were defined so as to compare with the results from the responses given by the respondents. This aided in the analysis to determine whether the responses were interpreted well or were misinterpreted.

The Conceptual Metaphor Theory was used to analyze the metaphors in terms of the target and source domain. According to Lakoff and Johnson (2003), target domain refers to the concept that is being talked about while the source domain refers to the concept attributed to the one being talked about. The researcher looked at some of the attributes associated with the target and source domains. The attributes in this case refer to the features that are part of the items that were discussed in the target and source domains. The analysis of the source and target domains for each of the metaphors was illustrated using figures. The figures captured the different domains alongside the attributes for each of the domains.

Table 4.1.1 Target and Source Domains of the Expressions

The table below shows the expressions in terms of their target and source domains.

Number	**Target Domain (Metaphorical Expression)**	**Source Domain**
1	The memory	should be increased
2	The port	is big
3	The processor	fits into the socket
4	The repeater	is faulty
5	The chip	needs to be upgraded
6	Buses	run in parallel lines
7	The host	is accessible
8	The mouse button	is tapped to execute commands
9	The card	cannot fit
10	The monitor	is shaky
11	Go	to the menu bar
12	*Lock*	*the computer*
13	Close	the window
14	Infected	by a virus
15	Put the computer	to sleep
16	The device	is plug and play
17	Empty	the bin
18	The driver	is corrupt
19	Zip	the document
20	Expand	the cell

Source: Researcher (2018)

In the second objective, the metaphors were discussed in terms of those which were successful or not. Those metaphors which succeeded in bringing understanding to the real life of the meaning of the expressions were considered to be successful while those which did not were considered unsuccessful. For example, if a virus in a person and a virus in a computer has somewhat similar attributes of damage or infection, then it is considered successful in the context of the analysis of this study. In other words, the meaning both in real life or actual usage and the meaning in computers both entail the aspect of damage or infection so that when someone hears the word virus, what comes to their mind is the concept of infection or damage.

Table 4.1.2 Summary of Successful and Unsuccessful Metaphors

The researcher analysed the metaphors in terms of those which were successful and those which were not.

This is summarized in table 4.1.2 below

Successful Metaphors	**Unsuccessful Metaphors**
Bin	Card
Bus	Cell
Chip	Plug and Play
Driver	Port
Host	
Lock	
Memory	
Menu Bar	
Monitor	
Mouse	
Processor	
Repeater	
Sleep	
Virus	
Window	
Zip	

Source: Researcher (2018)

The last objective involved the assessment of the cases of misinterpretation of expressions used in computers. This was obtained from the responses from the questionnaire. The analysis showed how the respondents interpreted the meanings of the metaphors and those that were not correct were considered as misinterpretations. This was determined by comparing the respondents' responses against the ones provided by the dictionary. This objective is discussed later in the chapter.

4.2 Analysis of the Metaphors

The metaphors were classified as either hardware or software since a computer consists of these two components. These metaphors were extracted from online computer articles using the MIPVU procedure.

The metaphors that are hardware in nature were discussed first and were arranged in alphabetical order. The same applied to the metaphors that are classified as software.

The table below shows the classification of the metaphors that were analyzed in this chapter.

Table 4.2.1 Classification of Metaphors

Hardware	**Software**
Bus	Bin
Card	Cell
Chip	Driver
Host	Lock
Memory	Menu Bar
Monitor	Plug and Play
Mouse	Sleep
Port	Virus
Processor	Window
Repeater	Zip

Source: Researcher (2018)

4.3 Analysis of the Hardware Metaphors

4.3.0 Introduction

This section addresses the concepts that focus on computer hardware. The analysis is discussed one after the other in alphabetical order.

4.3.1 The Bus Metaphor

According to the *Macmillan English Dictionary for Advanced Learners*, a *bus* is a large road vehicle with a lot of seats that you pay to travel on. Metaphorically

speaking or in terms of computing, a *bus* is defined as a set of wires that send information from one part of a computer system to another.

The Conceptual Metaphor Theory was used to discuss the source and target domains. The source domain *parallel lines* is used to explain the target domain of *buses*. The mapping of the bus metaphor is linked to a *vehicle*.

This is illustrated in figure 4.3.1 below.

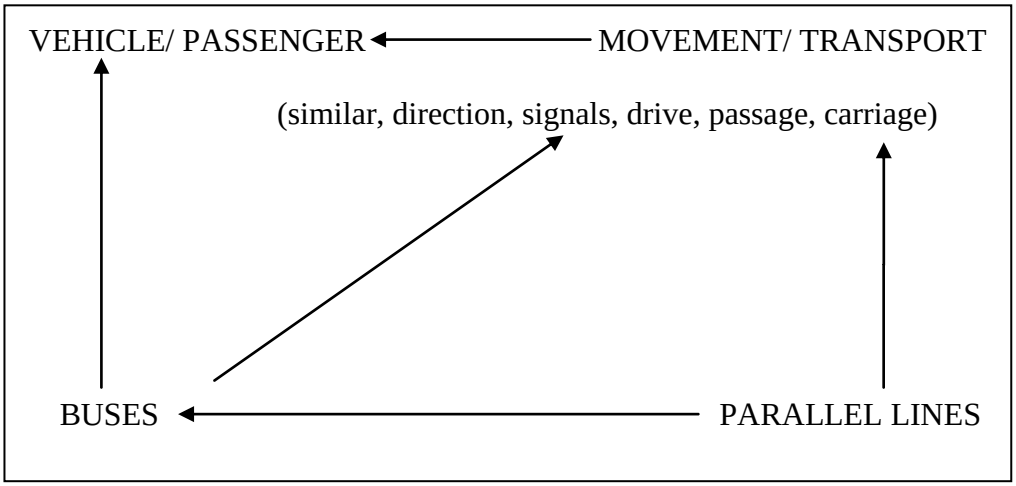


Figure 4.3.1: Mapping for the Bus Metaphor

Parallel lines signify the fact that vehicles on a road move at opposing directions, or they may be moving in the same direction especially on a highway where there are two lanes going towards the same direction and another going towards the opposite direction. The way the movement takes place in buses is normally in a similar fashion, that is, parallel. There are very many buses in a computer system which ensures passage of signals from one part of the computer to another. Buses carry power, data, signals, address amongst others. The different things that are

carried by computer buses symbolize what a literal bus carries, that is, passengers and goods. Buses could also be headed in the same direction, one behind another and this is also how computer signals operate.

Hayes *et* al. (1999) notes that a human driver carry passengers who have different thoughts, feelings, urges, memories and other experiences. A driver must make a decision about the direction to use while taking the passengers to their destination. These experiences that seem to drive the passengers cannot be seen and can be likened to the signals that are transported by buses within a computer system. In this sense, the bus symbolizes the mind and the passengers represent their diverse internal experiences. This is emphasized more by Casnig (2013) who notes that in a computer system, bits travel all the time on a data bus.

The attributes of *vehicle* and *movement* or *transportation* are applicable to a bus from both the literal and computer contexts. The only difference is that in a literal way, there is a designated visible driver that drives a bus. In the case of a computer, buses are not visible and the way they carry signals happens internally within the computer. The metaphor is therefore *successful* since the term *bus* involves the aspect of *movement* or *transportation*.

4.3.2 The Card Metaphor

A *card* has several meanings in the normal usage. It refers to a thick stiff paper that is thinner than a cardboard; one of a set of small pieces of thick stiff paper

used in games or activities; a small flat piece of plastic used for getting money from a bank, cash machine among others or for buying things. In computing, it is defined as a circuit board that fits inside a computer and connects to a particular piece of equipment such as a modem or a computer screen.

The source domain *fit* is used to explain the target domain *card* as shown in figure 4.3.2 below.

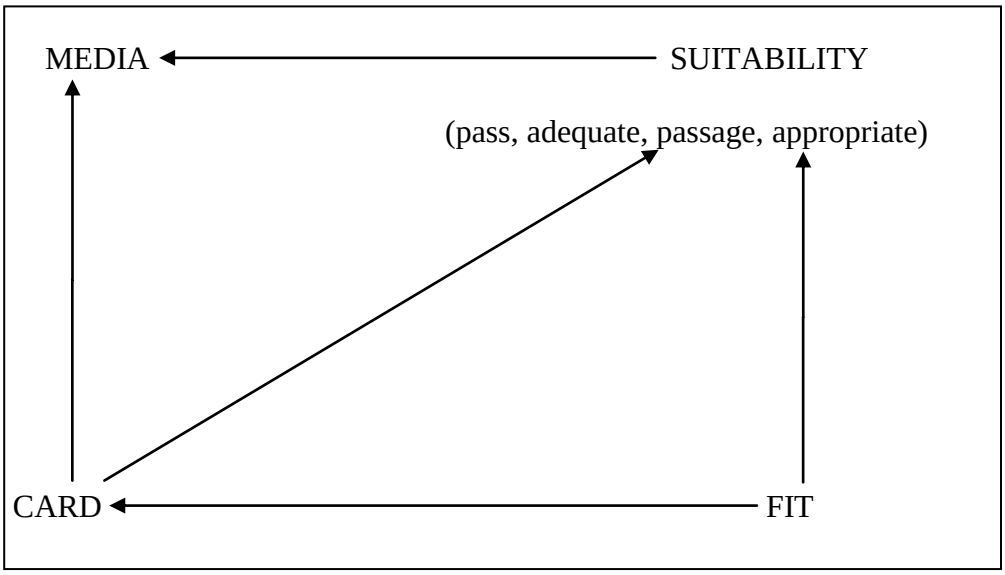


Figure 4.3.2: Mapping for the Card Metaphor

There are so many things that are supposed to fit in different places, a card being one of those things. A card is a rectangular piece of stiff paper or plastic that is used for different functions. One can talk about a credit card, a SIM card, an ATM card, a mobile scratch card, a business card, a birthday card. For some of the transactions to take place, some of the cards need to be put in a slot. However,

there are times when some of the cards cannot enter the slots. For example, a card may be bigger or smaller as compared to the slot where it is supposed to be fitted, a SIM card may not be compatible with the slot in the phone and therefore may need to be cut. An ATM card may not enter into the machine's slot maybe due to some faults in the machine or with the card itself.

The *card* metaphor is associated with the attributes of media and the associated suitability. Different cards are suitable for the slots that they can fit, failure to which the card cannot be used. One cannot insert a business card into an ATM slot. One cannot a computer's ISA VGA card into a PCI slot.

The metaphor is *not successful* since a card in the normal usage may or may not have to be fitted into a slot for it to be used. On the other hand, a computer's card must be fitted into a compatible slot for it to be used successfully.

4.3.3 The Chip Metaphor

The term *chip* literally refers to a thin piece of potato, cassava banana, arrowroot that is deep fried and that is very popular in restaurants and hotels. This term also has connotations to do with chip of wood, chip of old brick amongst others. A chip with regard to stone is referred to as a small, angular chip of stone that has been washed of dust. There are roads that are made of certain stones called chips or ballast and if this wears out to the dissatisfaction of people, there may be calls to

have the road upgraded by having better and quality chips or ballast. In restaurants, when people are not impressed with the quality of chips (fried potatoes) that are being served, there may be calls for an improvement in terms of the type of potatoes to be used, the kind of oil or just basically the way it is cooked. ‘Chip’ also refers to a small piece of something such as wood or glass, especially when it has broken off something. A chip in computing terms refers to a piece of silicon which is a semiconducting material that has electronic connections and that is part of computers and other machines. There are many chips in the computer, for example, memory chips, microprocessors, standard chips, among others. If the performance of a chip is compromising the efficiency of a computer, there may be a need to improve on it, what is referred to as upgrading. This means removing or replacing the current one with a new one that has higher specifications in terms of speed, capacity and other features. It also means adding another chip that will work hand in hand with the current one.

The source domain *upgrade* is explained in terms of the target domain *chip*. The illustration is shown in figure 4.3.3 below.

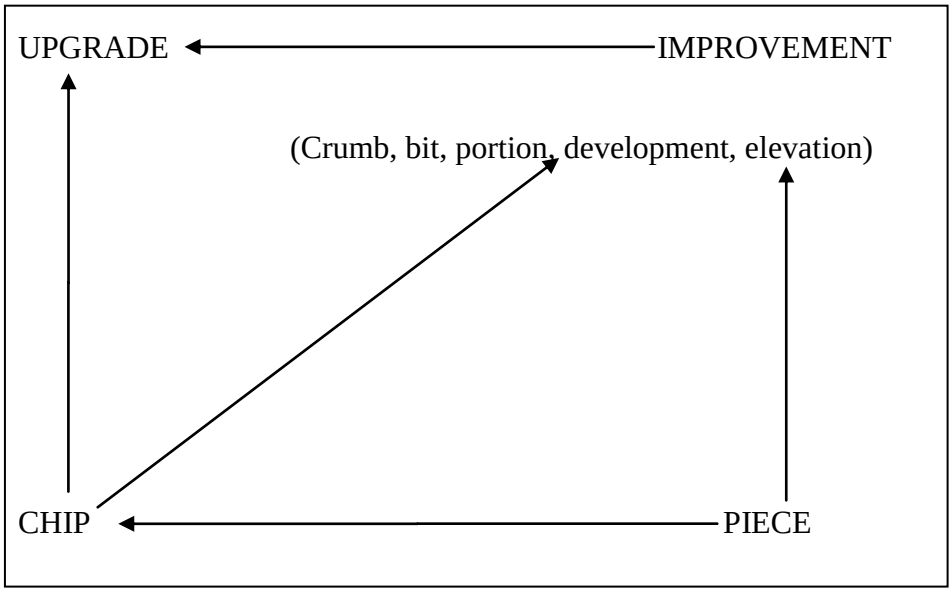


Figure 4.3.3: Mapping for the Chip Metaphor

The attributes associated with the metaphor are *piece* and *improvement*. The attribute improvement is a subset of upgrade. A chip from both perspectives refers to a piece of something. While a computer chip requires upgrades from time to time as it deems fit, a chip from the literal context cannot be upgraded. One of the things that can be done is to have improvements on how the chip is prepared; from the type of potatoes used to the other processes that are involved to the point of it being a finished product for consumption.

The *chip* metaphor is *successful* in the way its meaning is presented. It brings out the element of a piece of something though the only difference is the functionality of the chip in question.

4.3.4 The Host Metaphor

The term *host* refers to someone who invites people to a meal or party, or to stay in their home. It also refers to someone who introduces and talks to the people taking part in a television or radio programme.

The source domain *accessible* is used to explain the target domain *host* as shown in figure 4.3.4 below.

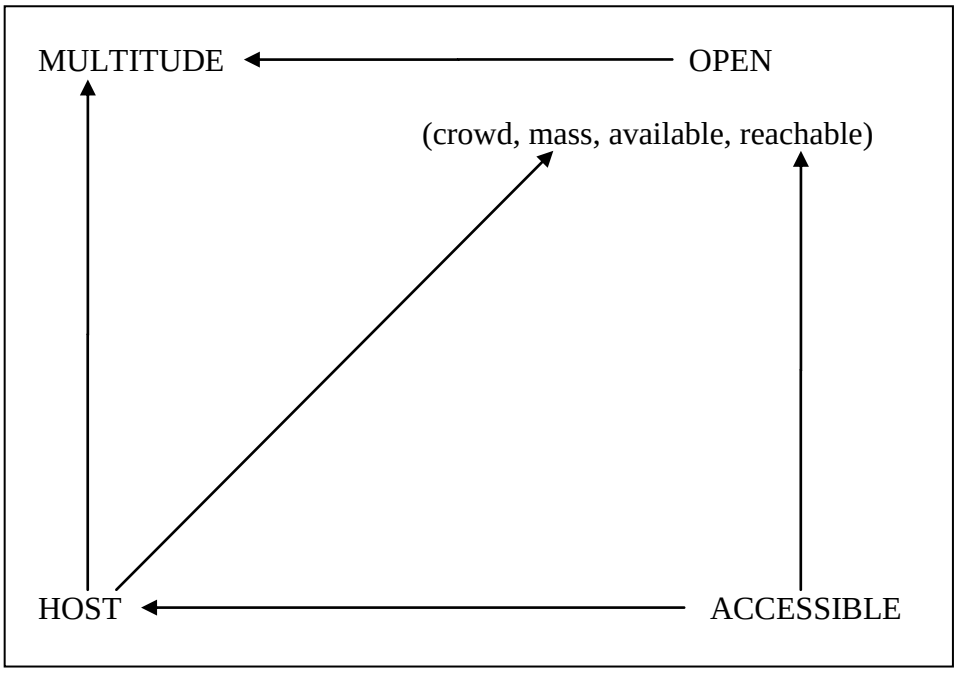


Figure 4.3.4: Mapping for the Host Metaphor

A host in computing refers to the main computer in a network that controls certain processes or files. A host has the attributes of *multitude*, *mass*, *crowd* among

others. Certain devices in the network, for example, computers or printers, normally access a host. A host can be a computer or a printer.

A human host also requires other people for certain interactions to succeed. This makes this metaphor *successful* because of the attributes of being accessed, the element of having more than one device or person for the hosting. When one hears the term host, they will relate it to some level of visitation or interaction.

4.3.5 The Memory Metaphor

The term *memory* in a literal sense refers to the fact that people remember a particular person or event or the ability to remember things. In computing, it refers to the part of a computer in which information, instructions and programs are stored.

According to Wilson (2010), the two domains of *memory* and *increase* are linked through a mapping such that the experience from one domain (memory) is used to understand the other domain (increase). The implication is that memory, whether from the perspective of a human being or a computer, can be increased. Memory is derived from human beings and its metaphorical interface is presented by the attributes associated with it, for example, storage, retention and refreshing.

Figure 4.3.5 illustrates the mapping of the memory metaphor.

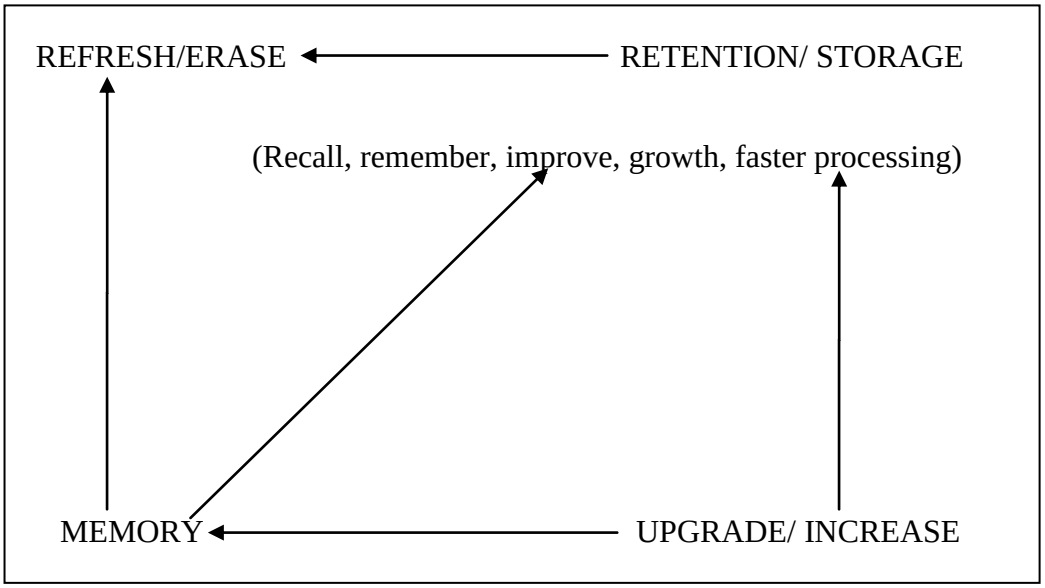


Figure 4.3.5: Mapping for the Memory Metaphor

The concepts of recalling, remembering, improvement and processing of information are manifested in humans. In computers, if the performance is being slowed down because of the many programs and applications that are running, one can consider upgrading or increasing the memory. For humans, the attribute of faster processing is not easily realized as opposed to in computers where the addition of more memory almost automatically adjusts the performance of the computer.

For the target domain *memory* to be successful in its attributes and functionality, it must correspond to the source domain of *increase*. When a memory is increased, the performance of a computer is enhanced. There is a relationship between

memory from the literal point of view and from a computer point of view and the element of increase can be applied in both contexts.

The *memory* metaphor is successful in the way it relates its attributes and its relationship to the literal memory. Just like a person's memory can be increased or enhanced, a computer's memory is normally increased to enhance the performance and functionality of a computer.

4.3.6 The Monitor Metaphor

The term *monitor* has both literal and computer or metaphorical meaning. A monitor is a pupil or student who helps a teacher with a particular job. Its verb form refers to the aspect of checking something regularly or watching someone so as to discover what is happening. In computing, it refers to a computer screen, or the part of a computer that contains the screen.

The source domain *shaky* can be explained in terms of the target domain *monitor*. The illustration is shown in figure 4.3.6 below.

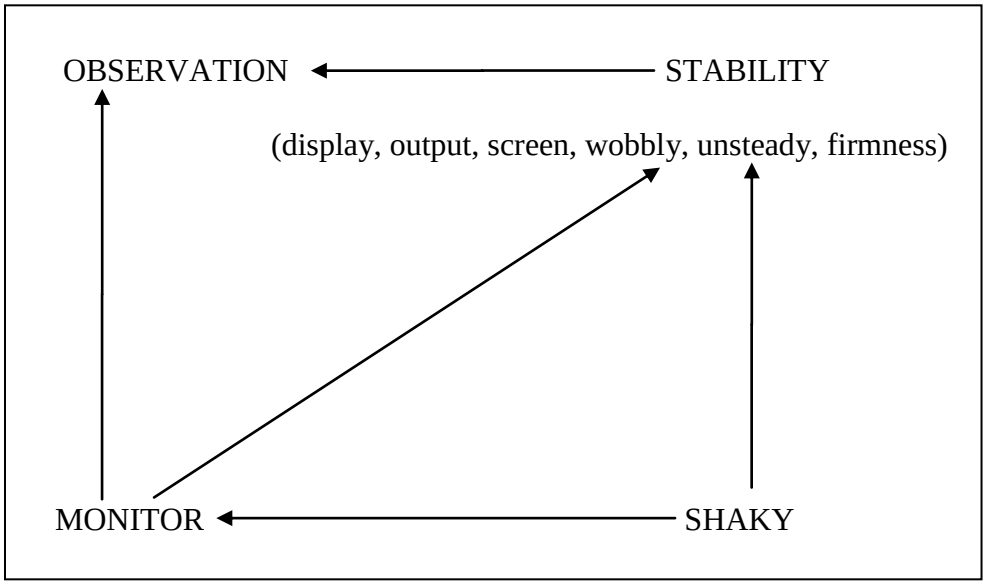


Figure 4.3.6: Mapping for the Monitor Metaphor

A monitor can be a human being in which case it refers to a student who has special duties within a school. It can be equipment which is used for checking, observing or keeping a continuous record of a process. It can also be an animal, in which case the reference may be a monitor lizard which is a special type of lizard or reptile. The verb monitor means observing and checking the progress of something. The aspect of shakiness means that the monitor may be wobbly, unstable, insecure, unsteady or rickety. One of the roles of a monitor in a school is to help the teacher with collecting books for marking or controlling noise. They are supposed to observe certain things and find ways of deterring them or forward them to a higher authority. If a student monitor is not steady in his or her work as per the requirements of the school, he or she should be replaced with another one

to ensure that some of the school operations that they are in charge of go on well. If the equipment is wobbly, it may interfere with the observations that are being done and therefore it may need to be replaced.

In computer, a monitor is an output device that is used to display what has been processed by the computer. A monitor is one of the most important components of a computer since it is the one that we use to see what we are doing. If it is shaky or faulty, it may interfere with our normal usage of the computer. A shaky monitor can cause eye problems and therefore needs to be repaired or replaced.

The *monitor* metaphor has the attributes of *observation*, *visibility*, *display*, *output* among others. Whether in the literal sense or in the context of a computer, a monitor is supposed to be used to observe activities that are happening or have happened and it is supposed to display the results.

The metaphor is therefore *successful* in the way users are to understand it regardless of the context in which it is used.

4.3.7 The Mouse Metaphor

A mouse is defined as a small furry animal with a long tail, while in computing, it refers to a small object that you move in order to do things on a computer screen. A mouse functions by the action of tapping which produces a clicking sound.

When you press on a part of the mouse, you tap on it. One also taps and consequently clicks on things on the computer screen, using a mouse.

The source domain *tap* is used to explain the target domain of *mouse*. The diagrammatical representation of the domain and the associated attributes are shown in figure 4.3.7 below.

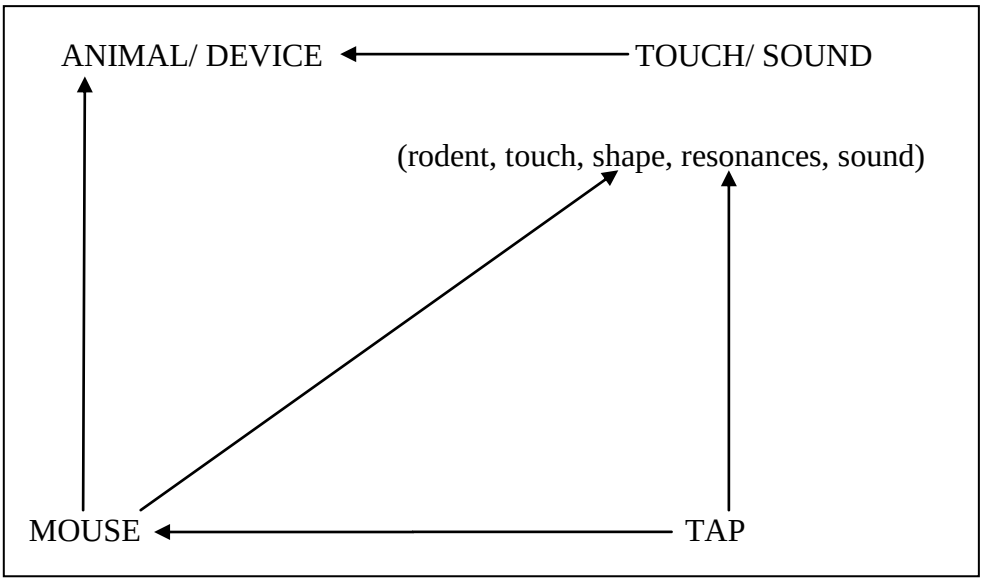


Figure 4.3.7 Mapping for the Mouse Metaphor

A mouse is a small rodent that is found in some houses and also in bushes. It is very alert and so sensitive to sound such that a slight sound makes it run away. There is a mapping of animal or device to the aspect of tap or touch which produces a click sound. In computing, a mouse is mouse-shaped input device that is used to issue instructions by tapping on the buttons, in what is referred to as clicking. When one taps on the left mouse button, that action is referred to as left

clicking. When one taps or touches on either of the buttons on the mouse, there is a sound that is produced. This is known as the click sound. A mouse is therefore a rodent which maps to the animal domain while in computers, it is a device.

The metaphor has the attributes of an *animal* in the case of a rodent and a device in the case of the pointing device on one hand, and the attribute of *tap* (touch) or sound on the other. In both cases, the element of sound and touch has an influence on a mouse. The shape of the pointing device is derived from the shape of the rodent (animal). The way a rodent moves is likened to the way one moves the mouse while using a computer.

The mouse metaphor is *successful* in the way it is realized since both the rodent (mouse) and the input device (computer mouse) appear to have the same shape. Shape is therefore an attribute that is shared by the mouse in a normal usage and in computers. According to The Washington Post, Douglas Engelbart, the inventor of the computer mouse, remarked that a mouse was named so because of the wire that connects it to the computer and that the connecting wire looks like the tail of a mouse, the rodent.

4.3.8 The Port Metaphor

A *port* is defined as an area of water where ships stop, including the buildings around it. In computing, it refers to a part of a computer that you fit a cable into so

that you can connect another piece of equipment to it, for example, the monitor port, the printer port, the universal serial bus (USB) port. A port is also defined as a place in front, sideways and at the back of a computer where an external device can be connected.

The *port* which is the target domain is mapped to the source domain which is denoted by the adjective *big* as shown in figure 4.3.8 below.

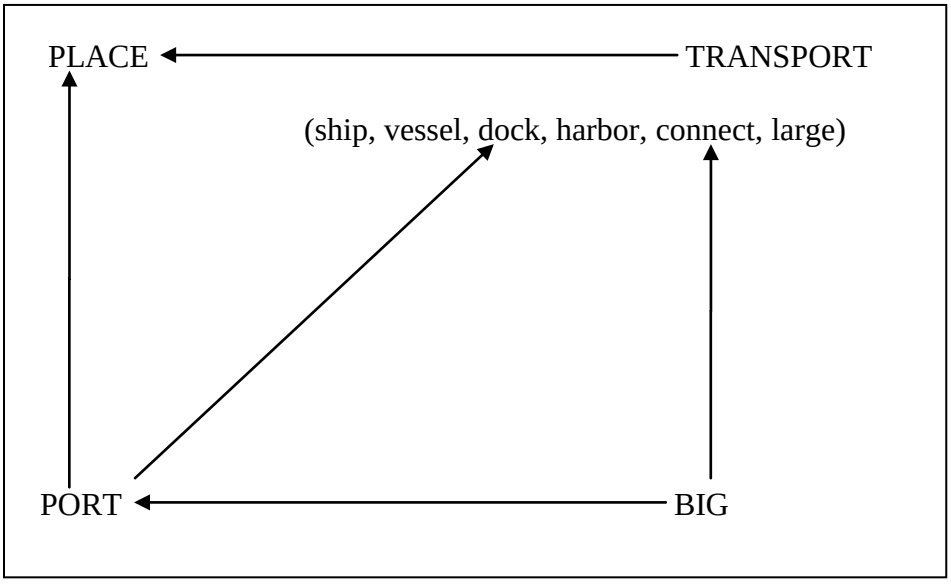


Figure 4.3.8: Mapping for the Port Metaphor

A port aids in the transportation and is therefore associated with the attributes of place and transport. In most houses or buildings, there are sections on the wall where a person can connect a device, for example, a television cable, a gas cylinder amongst others. These ports enable the transportation of signals or gas (in the case of gas) between the different devices. A port is also a place on the wall of

a building where cables can be connected. In an office, a network cable is connected to the port on the wall and then connected to a computer or a printer. Signals will then be transported from one computer to the other or from a computer to a printer. If a port is large, then it means that many ships can dock. On the other hand, if a computer's port is big, it means that a corresponding big connector must be used for the connection to be established. If a person, for example, wants to use a flash disk, it should be inserted into the USB port. Inserting it, for example, in the network port will not make it to work since the network port is larger than the disk.

Casnig (2013) records that a port is a transmission section from where data is shipped. The metaphor *port* is associated with the attribute of *transport* and *place* since in terms of the normal usage, a ship which is used for transportation of people and goods finally terminates its journey at a port (place). A port is also an opening in the side of a ship for boarding or loading. In computing, once a device has been connected to a port that is functional, signals are transported from the device through the computer system and is consequently processed and used.

The attributes of *transport* and *place* are related both in the literal view of a port and as it is used in a computer. The metaphor presents a relationship between a literal port and a computer port.

The *port* metaphor is *not successful* since the mention of the word port in a literal way does not relate easily with a connection point as it is in the context of a computer.

4.3.9 The Processor Metaphor

A processor refers to a machine that executes an operation on something, for example, a food processor. In computing, it is the part of a computer that controls and performs all its operations which includes receiving instructions and translating them in a way that a computer user can understand. A processor is also defined as a hardware component whose function is to execute instructions in a computer

The source domain *socket* maps into the target domain *processor*. By extension, the processor and the socket map to the *processing* domain as shown in figure 4.3.9 below.

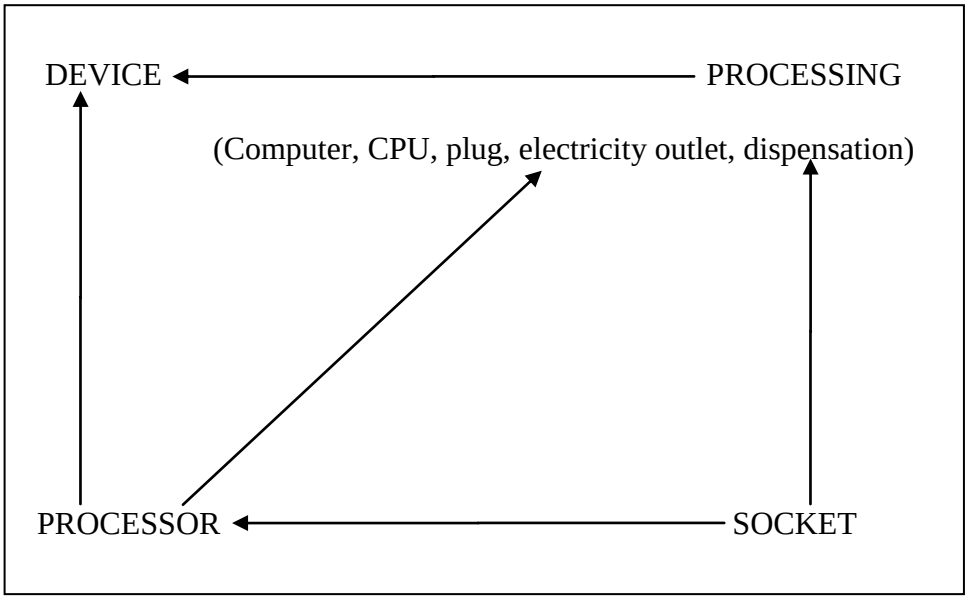


Figure 4.3.9: Mapping for the Processor Metaphor

A processor is a machine that is used to process or make something to turn out into a different form, for example, a food processor can be used to blend food, that is, makes the food become smooth. Processors are used in most manufacturing companies and even in homes. For a processor to work, most of them require the supply of electricity. In this case, it is normally connected to a socket through a plug after which it is turned on. The processor is then able to transform and dispense, for example, solid fruits into liquids like juices. The cable for the processor should be able to fit into the electricity socket otherwise the processor will not function. A computer cannot function without a processor. There should be compatibility between a processor and the socket where it is to be fitted. When a processor is to be changed or replaced, one needs to ensure that the processor is

the correct one for the socket otherwise it will not fit and therefore the computer will not work.

The attributes of a processor, that is, *device* and *processing*, apply in both ways. A literal processor and a computer processor are both devices and are involved in some processing of some sort. The other key factor is that during the connection, the requisite components should be able to fit into the socket so that the device can function properly. A processor also requires power which is realized through electricity for it to function.

The metaphor is *successful* since whether literally speaking or from the context of a computer, a processor transforms unfinished products into finished ones. For a processor to work well, it is connected to some other components. If it fits, then the processing takes place. If it does not fit, then it cannot work and will consequently not process the required items.

4.3.10 The Repeater Metaphor

The term repeater comes from the verb repeat which means to do (something) again or more than once; hence it is a person or thing that repeats something. In computing, it refers to a network device used to regenerate or replicate a signal. Repeaters are used in transmission systems to regenerate analog or digital signals distorted by transmission loss.

The source domain that is denoted by the adjective *faulty* is used to explain the target domain *repeater*. The mapping of the metaphor is shown in figure 4.3.10 below.

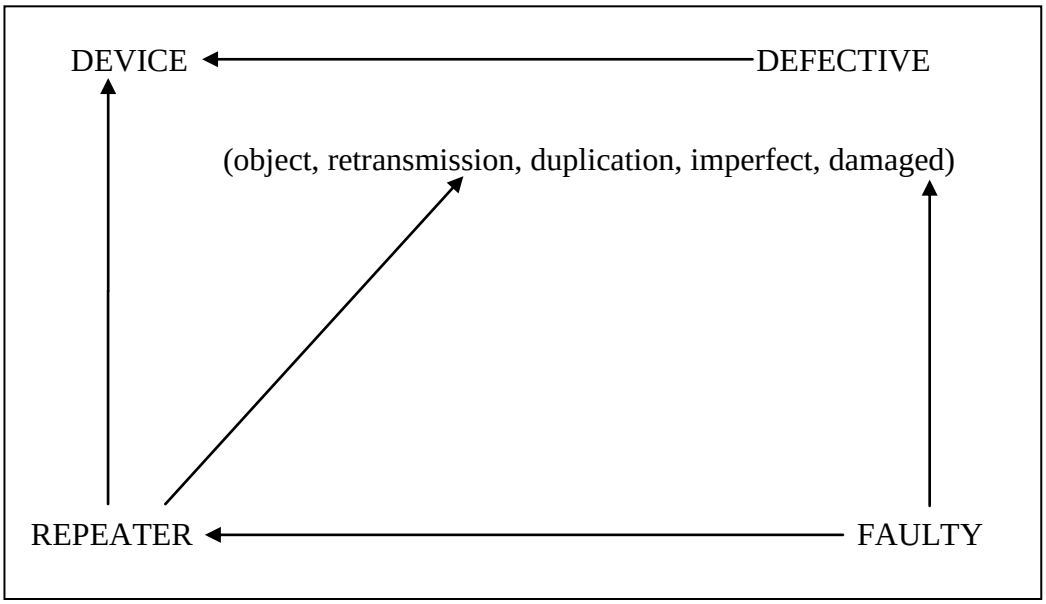


Figure 4.3.10: Mapping for the Repeater Metaphor

A person can repeat something and if the said thing is not properly done, then it can termed as flawed or imperfect. A repeater in a network is supposed to repeat or retransmit the signals which are weak to the point where they are required. The device can break down or be faulty such that it cannot do its function of retransmission of signals.

The metaphor is *successful* since the term repeater denotes the element of doing something again whether in the normal usage or in the context of a computer.

4.4 Analysis of the Software Metaphors

4.4.0 Introduction

This section addresses the concepts that focus on computer software. The analysis of the metaphors is discussed one after the other in alphabetical order.

4.4.1 The Bin Metaphor

A *bin* refers to a container for putting rubbish in. In computing, a bin, also known as a recycle bin, is a place where files, documents and programs that have been removed or deleted in a computer are kept.

The source domain, *bin*, has been used to explain the target domain which is denoted by the adjective *empty*. The expression is as shown in figure 4.4.1 below.

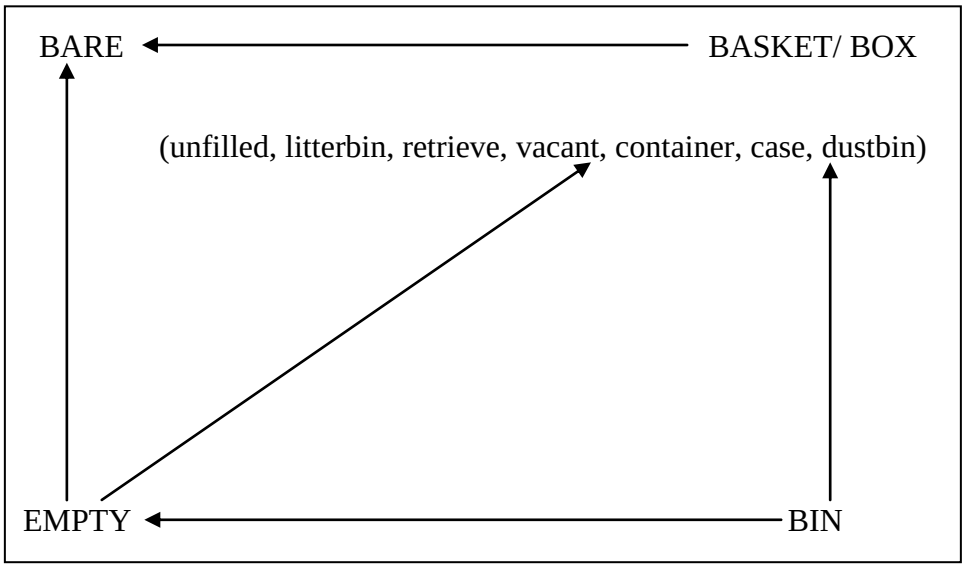


Figure 4.4.1: Mapping for the Bin Metaphor

A *bin*, sometimes referred to as a trashcan, waste bin, dust bin or a litter bin is a special container that is used to keep waste or litter. Whenever a bin is full, it is

supposed to be emptied to create space for more waste to be put in later on. In computing, the recycle bin is a program that is used to store files, folders and other documents that have been deleted by a user. It is the place where unwanted documents are 'thrown into' just like the normal waste bins at home, offices, hospitals among others. A recycle bin allows a user to get back whatever they have deleted hence the usage of the word *recycle*. However, any files deleted from the bin are permanently removed and cannot be gotten back or restored. In a normal bin, one can also retrieve what had been thrown into the bin, for example, a piece of paper.

Kinshuk (2016) postulates that the bin metaphor was born out of the traditional baskets that are used at home or in offices where things that may not be needed are put. He adds that the concept of the bin in the real world makes it easy for one to understand it from the context of a computer.

Marcus (2015) concludes that this is a well-designed metaphor which can help users to understand the concepts as they are used in computers. The researcher also notes that the concept of the bin relates to a similar understanding whenever the term is used in a normal conversation or in the context of a computer.

The metaphor is therefore *successful* in its relationship between the normal usage and the computer usage.

4.4.2 The Cell Metaphor

A *cell* refers to the smallest part of a living structure that can operate as an independent unit. The other definition of a cell is a small room where prisoners are kept. In computing, a cell refers to a small square in a pattern of squares on a computer spreadsheet for writing numbers or words in.

The source domain *cell* has been used to explain the target domain which is *expand.* The metaphorical representation is shown in figure 4.4.2 below.

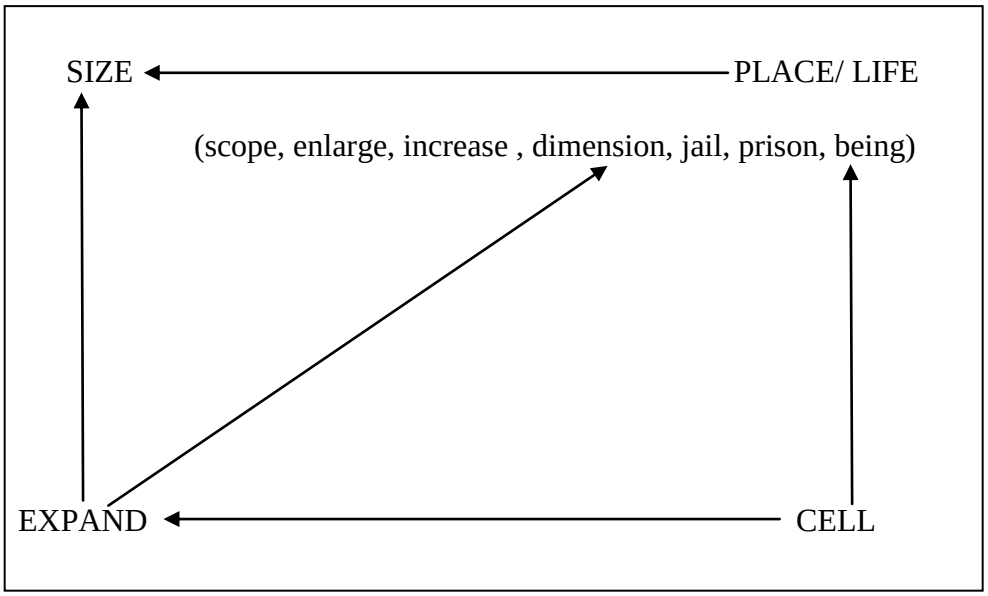


Figure 4.4.2: Mapping for the Cell Metaphor

A cell, whether in the literal or metaphorical sense, can be expanded or enlarged or enlarge itself. A cell is an important part of a human being that has life. Human beings have different types of cells that work in unison to ensure the sustenance of life, for example, red blood cells, white blood cells, among others. Sometimes due

to certain medical conditions, cells may enlarge or become abnormal. A cell is also associated with the concept of place in which case it refers to a place where prisoners are kept. If prisoners are overcrowded in a cell, there may be calls to expand it so that there is no congestion. A cell from these two illustrations can expand or be expanded.

In computing, a *cell* refers to an intersection between rows and columns or a small square in a pattern of squares in a computer spreadsheet that is used for typing numbers or words. Whenever numbers or words are typed in a cell are they are not visible, the cell needs to be enlarged so that its contents become visible.

The metaphor uses the attributes of *place* and *life* as well as the concept of *size*. A cell has got the connotation of a place, for example, where lawbreakers are kept or the unit of life that is associated with human beings.

It is worth nothing that the term *cell* on its own, connotes different meanings from the normal as well as its usage in computers. The metaphor is therefore not *successful.*

4.4.3 The Driver Metaphor

A driver is someone who drives a vehicle, especially as their job, for example, a taxi driver or a bus driver. In computing, it is defined as a software that controls a piece of equipment connected to a computer, for example, a printer driver. It communicates with the device through different parts that the hardware is connected to. If a driver is corrupt, for example, it means that it has become unusable or inoperable. The device that is connected to the corrupt driver becomes inaccessible or not usable. In this case, there may be a need to remove or uninstall the spoilt driver and add a new one so that the operations of the device can continue. Just like a driver 'drives' a car, the device driver 'drives' the physical components of a computer (hardware). If there is no driver, a car cannot move. Similarly, if there is no device driver or if the driver is spoilt, a hardware component in the computer cannot function.

The source domain of *corruption* has been used to explain the target domain which is *the computer driver* as shown in figure 4.4.3 below.

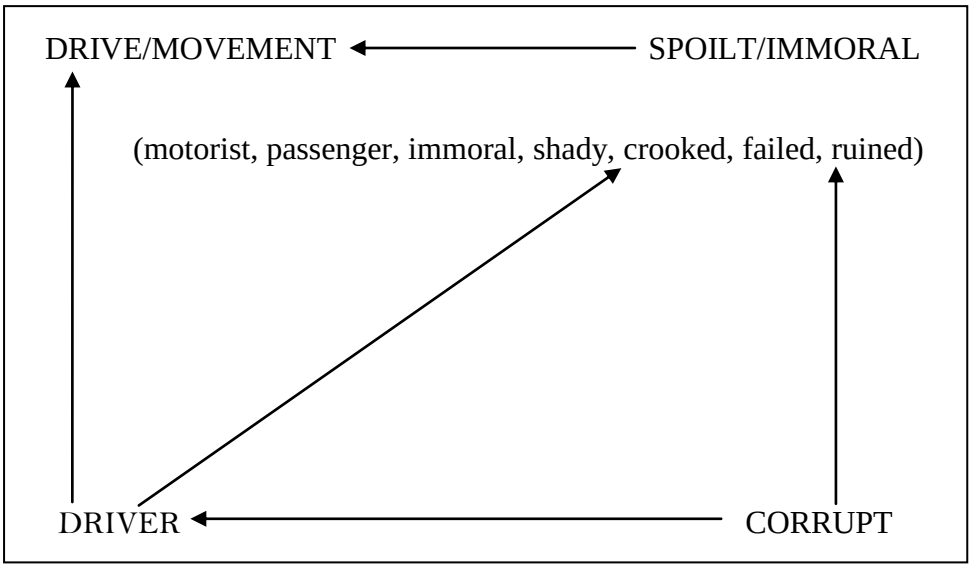


Figure 4.4.3: Mapping for the Driver Metaphor

The literal meaning of this expression would be that a person who drives a car or a bus is unethical since he gives bribes to the police. This may be evident in instances where the driver is stopped, for example, for contravening traffic rules and instead of agreeing to the offence committed, he offers a bribe to the police so that he is allowed to continue with the journey. In computing, a driver is a program that controls a particular device in a computer. It communicates with the device through different parts that the hardware is connected to. It is also the software that controls the hardware components in a computer. If a driver is corrupt, it means that it has become unusable or inoperable. The device that is connected to the corrupt driver becomes inaccessible or not usable. In this case, there may be a need to remove the spoilt driver and add a new one so that the operations of the device can continue.

The driver metaphor is related with the attributes of *drive*, *movement*, *spoilt* or *immoral*. It is therefore *successful* in the way it compares a corrupt driver from the literal and computer dimensions. Just like a driver drives a car, the device driver drives the physical components of a computer (hardware). If there is no driver, a car cannot move.

Similarly, if there is no device driver or if the driver is spoilt, no hardware component in the computer can function. When a driver is corrupt, it raises a moral issue and this destroys the society. Likewise, when a computer driver is corrupt, the hardware components whose drivers are corrupt will not function properly.

4.4.4 The Lock Metaphor

Literally speaking, 'to lock' is to fasten something such as a door or a container, usually with a key, so that other people cannot open it. In computing, to lock is to prevent information on a computer from being changed or looked at by someone who does not have permission.

The source domain *the computer* has been used to explain the target domain of *locking*. The figure 4.4.4 below shows how this is represented.

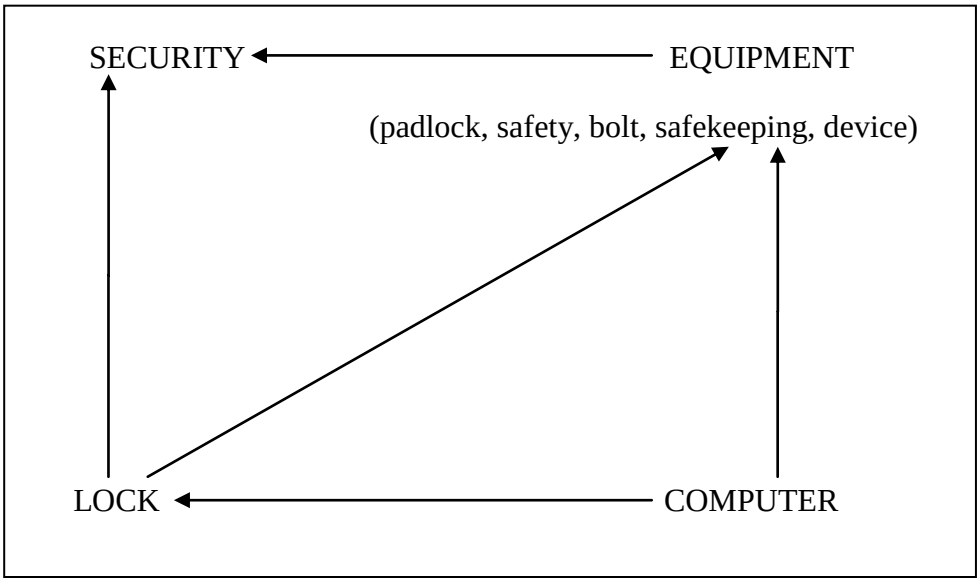


Figure 4.4.4: Mapping for the Lock Metaphor

Locking is a security measure that is carried out to ensure that there is no loss of property or even lives. People lock their doors to keep away thieves, for example. People lock their gates to ensure that they are secure though at times locking is not a complete guarantee of security since people with bad intentions can still break in. In organizations, certain equipment are normally locked to prevent unauthorized persons from accessing them, for example, server rooms, strong rooms in banks are normally locked to keep away unwanted or unauthorized persons. All this is done to ensure the security of the equipment hence the *security- equipment* mapping. People use padlocks, keys and other security products for locking.

In terms of computing, locking a computer refers to a process that is used to prevent unauthorized people from accessing one's computer or viewing one's

work. It is used when one needs to step out a bit without necessarily shutting down the computer. Unlike in the literal usage where we use padlocks, keys and other devices, in computers, there is an in built facility that is used for locking. To access a computer that is locked, one requires a password which in this case is the key for access.

The metaphor is *successful* since the attributes of safety and equipment apply in both the literal and computer usage. Locking involves the usage of an equipment, for example, the in-built locking facility in computers and padlock or keys in the normal usage. The idea behind the locking is to ensure safety of information, equipment or property and lives.

4.4.5 The Menu Bar Metaphor

The word menu is defined as a list of the food that is available in a restaurant, café, etc. In computing, it is defined as a list of choices on a computer screen that tells one what one can do in a particular program.

The expression was mapped in terms of the target domain which is denoted by the verb *go* and the *menu* which is the source domain.

The representation is as shown in figure 4.4.5 below.

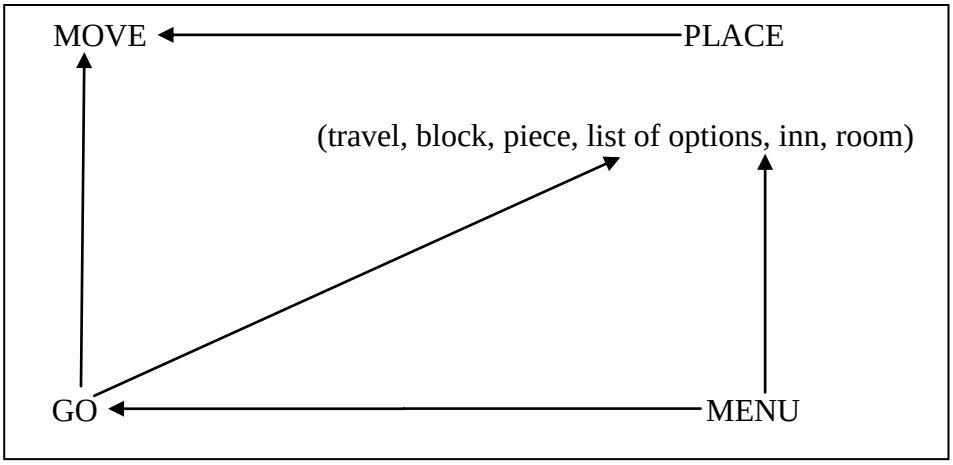


Figure 4.4.5: Mapping for the Menu Metaphor

This is an expression that can be looked at literally and metaphorically. The expression may mean that one is being asked to visit a place where they sell drinks. The place in question has a specific name; it is called the 'menu' bar. This means that there may be many other restaurants or bars within the locality of focus but one is being directed to a specific place. The expression therefore has a mapping of movement and place. In computer usage, a bar is a list of options that is found on a program or window. The menu bar consists of many options just like in the literal usage where one chooses from a list of menu of food items in a restaurant. In computing, there is the home menu, insert menu, view menu, page layout menu amongst others. Going to the menu bar means refers to a process where a user selects an option that they may want to use while working on a document in the computer.

The metaphor is *successful* in the explanation of the attribute of place for both the menu and the bar from the literal and computer usage. Menu is a list of options that is found in a computer as well as in food joints like restaurants. A bar is a place in a computer where different options for usage are available just the same way it is a place where people get to enjoy different drinks.

4.4.6 The Plug and Play Metaphor

Plug refers an object used for connecting a piece of equipment to an electricity supply. Play on the other hand refers to taking part in a sport or game or to compete against someone in a sport or game. In computing, plug-and-play software or computer equipment are those which are immediately ready for use when they are connected to a computer.

The source domain of *plug and play* has been used to explain the target domain which is *the device*. This is illustrated in figure 4.4.6 below.

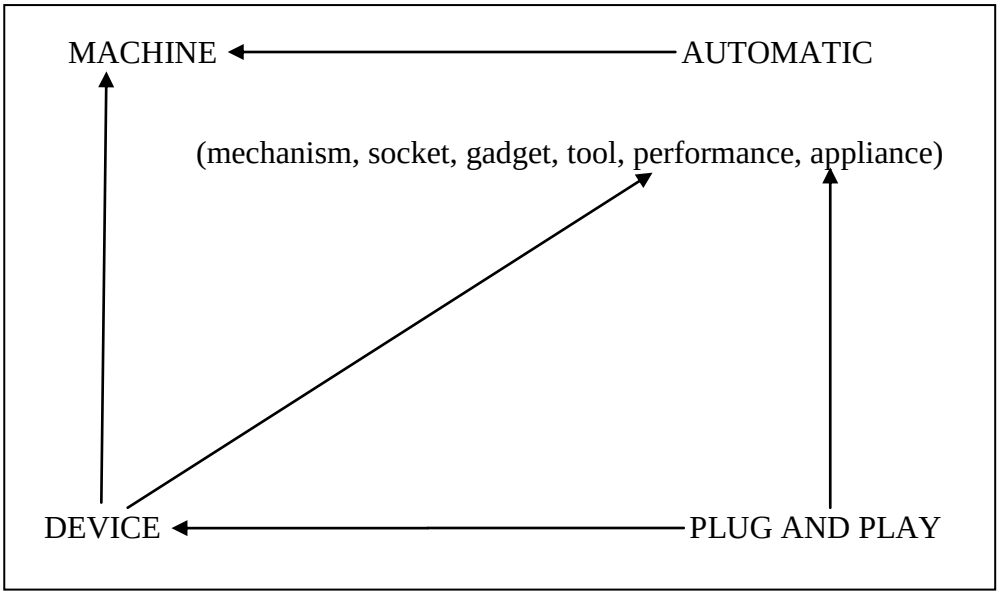


Figure 4.4.6: Mapping for the Plug and Play Metaphor

The expression may be used to refer to a situation where a device is readily usable. In terms of music, for example, it may mean a situation where one connects a machine and automatically starts listening to music. In computers, plug and play has got nothing to do with performance or music but has got everything to do with the automatic usage of a device that has been connected. In other words, it refers to devices that are connected to a computer and they start working immediately without any interventions. There are certain devices that must have software installed and configured in the computer before they can work. Plug and play therefore ensures the automatic operation of different devices in a computer.

The metaphor is not *successful* since there is no relationship between plug and play as used in computers and as it applies in the literal usage. The machines or

devices that work automatically in real life are not necessarily referred to as plug and play devices. When one connects a compact disk (CD) or a Digital Versatile Disk (DVD) in the DVD machine, music will start playing almost automatically. This does not denote the understanding or concept of plug and play in this context. Marcus (2015) observes that plug and play is not well designed as a metaphor and therefore does not provide so much help to users in terms of its understanding.

4.4.7 The Sleep Metaphor

Sleep means to go into a natural state in which one is unconscious for a time and the body rests, especially for several hours at night. According to techtarget.com, sleep mode in computing refers to a power-sparing state that a computer can enter when not in use. Most computers and computing devices are set to enter sleep mode after a certain period of inactivity.

The mapping of the metaphor is as shown in figure 4.4.7 below.

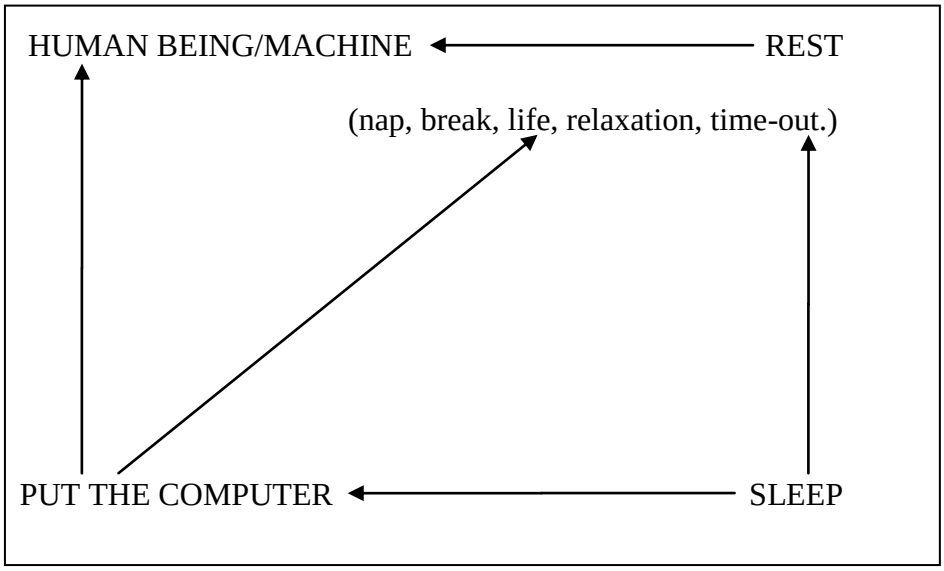


Figure 4.4.7: Mapping for the Sleep Metaphor

Sleep is an aspect of rest that is applicable to human beings, animals and other organisms as well. When a person is tired, he or she may want to rest or at best sleep. Naturally at night, people are supposed to sleep so that they can rest their bodies to be rejuvenated for the following day's engagements. When one does not sleep, there may be physical and health consequences, for example, high blood pressure, heart disease, stroke, decreased performance and alertness amongst others. People should therefore have adequate sleep. In computing, sleep can be equated to the way one may pause a DVD movie. In it, all the activities in the computer are halted and any document that was opened is put in memory. Sleep mode reduces the level or usage of electricity consumed since most of the applications run on low power.

The metaphor is therefore *successful* since it leads to the *human being/machine – rest* mapping. The attributes of nap, break, life, relaxation, time-out are brought out through this metaphor both in human beings as well as in computers. Just like a human being needs rest in terms of sleep, so do electronic devices like computers. During sleep, there is less activity that takes place in both humans as well as in computers.

4.4.8 The Virus Metaphor

A virus is defined as a simple living thing that is smaller than bacteria and that can enter one's body and make them ill. If one's body can protect itself against a particular virus, then they are immune to it. In computing, if a computer virus infects a computer or computer program, it enters it and causes problems. It is also defined in computing as a program that enters a computer and damages or destroys information that has been stored.

The source domain of *a human virus* is mapped to the target domain a *computer virus* which causes *infection* as shown in figure 4.4.8 below.

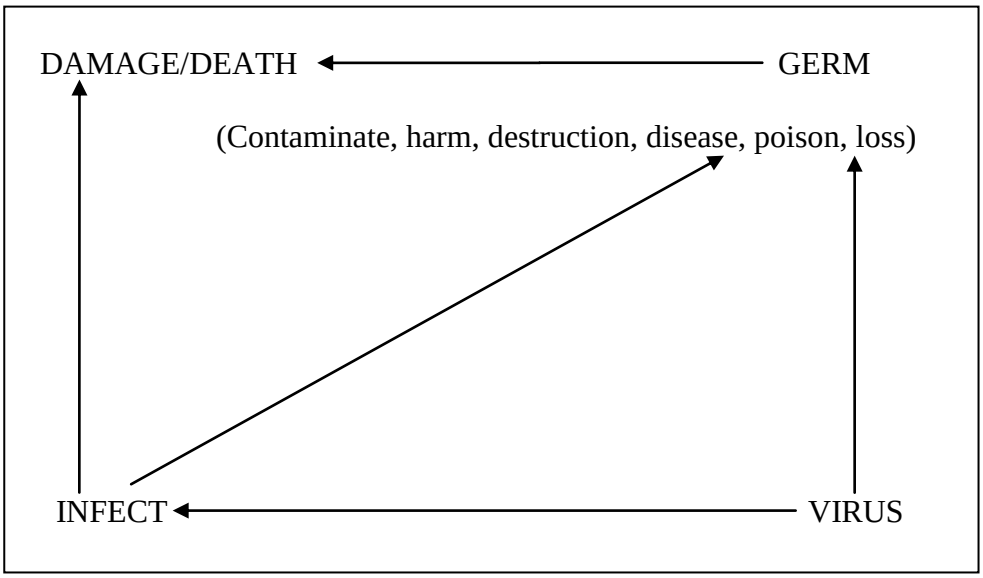


Figure 4.4.8: Mapping for the Virus Metaphor

A virus causes infections to human beings. A virus is a living thing that enters one's body through any of the openings, for example, mouth and nose. When a virus enters a person, they attach themselves to the outside of the kind of cell that it attacks. This is called the host cell. They cause illnesses by destroying the functions of a large number of important cells in the body. There are physical manifestations that are prevalent when a virus infects someone. The viral infection may sometimes spread from one person to another. Cohen (1990) notes that a virus in computing is a software that replicates and spreads by attaching itself to a computer and its resources. He continues to say that like a biological virus, which attacks cells, a computer virus attacks the security components of a system making the system to be vulnerable. In this case, the virus is said to spread *digital* disease.

Despite the fact that a computer is not a human being, it can as well get ‘sick’ from viruses. A virus is an unwanted software or program that enters into a computer and infects it. A virus can cause a lot of destruction like it does in humans. Viruses attack specific things or components in a computer. Some of the components or items that are infected by a virus in a computer include files and folders, system files, memory, hard disk and programs.

It is worth noting that just like there are vaccines and drugs that are used to contain human viruses, there are antiviruses that are used to stop viruses from causing damage in a computer system. Sometimes the antiviruses are not effective because of the nature of the viruses and possibly because of an outdated antivirus or one which has not been updated.

There is therefore a relationship between a virus infection and *death* or *destruction* and hence the death/ destruction – germ analysis. A virus can and has led to the death of humans. A computer virus causes lots of destructions if not removed by the relevant antiviruses and can sometimes cause the computer to crash. Crashing is a metaphor which means the inability of the computer to be used. When a computer crashes, there is normally a need to have it replaced since in most cases, it may not be usable.

The virus metaphor is *successful* since its attributes of destruction, disease and death apply to both the humans as well as computers. When one hears about a virus, what comes to their mind is something that causes infection, loss and damage. It is also successful since the computer virus is similar in form, function and consequence to the human viruses. The computer virus attacks the computer system while the human virus attacks the human system. When a person has a viral infection, they are required to visit a clinic the same way a computer infected will require that it be taken to a 'virus clinic' so that it can be 'cured' using a relevant anti-virus program.

4.4.9 The Window Metaphor

A window is defined as a frame in a wall with glass, wood and steel in it that lets light and air into a room and lets one see what is outside. In computing, a window is one of the different work areas on a computer screen or a program that is running.

The source domain of *the window* is used to explain the target domain of *close*. This is illustrated in figure 4.4.9 below.

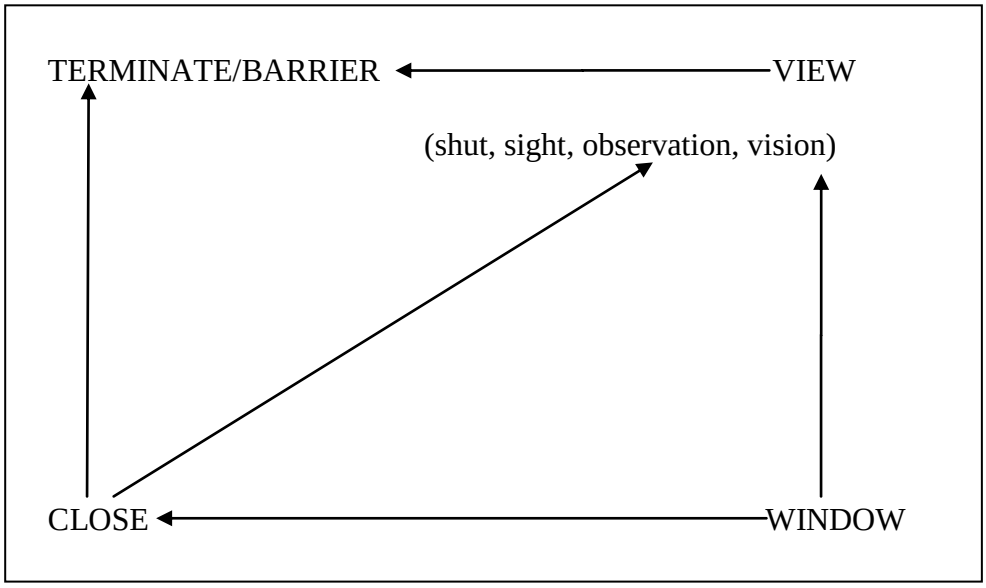


Figure 4.4.9: Mapping for the Window Metaphor

A window is an opening in a house that gives in light and fresh air and that is closed at night to prevent bad things from entering into the house through it. It is also closed during the cold seasons to make the house warm. According to an article by the State University of New York/Purchase (1987), the normal windows in houses draw a border between the internal and the external, between secretive and open. The border can be accessed through the window from either side because of the transparent glasses. The clear glasses are susceptible to physical attacks and stares by people and therefore people put up curtains. The window metaphor has brought out the elements of sight and perception such that expressions such as ‘the eyes being the windows of the soul’ are used in different situations.

When one hears about closing a window, what comes to mind is the opening in the house. The expression maps to the *terminate/ barrier* and *view* in windows. When a window is opened, one is able to view the outside of the house and those who are outside can view the inside of the house. When a window is closed, it creates a barrier since one is not able to see the inside or the outside of the house. In computing, a window is a program that is currently being used. It is also a program that occupies some space on the desktop. A program can be opened and closed. When one has used a program and wants to move to something else or wants to shut down the computer, they close the program. This is what is referred to as closing the window or terminating the program. When a program is opened, one is able to view and use it. When it is closed, it is no longer visible since it disappears.

The window metaphor is *successful* in both the literal and computer usage. Closing a window brings out the elements of terminate, barrier, view, shut, sight, observation, vision. Closing or shutting a window creates a barrier where one is not able to view or observe what they had intended. A window enables us to view. This is true for both a window in the normal usage and a window in computer.

4.4.10 The Zip Metaphor

A zip refers to a long narrow metal or plastic object with two rows of teeth, used for closing or opening something, especially a piece of clothing. In computing, zip

refers to compressing a computer document such as a folder so that it fills less space and can be stored more easily or sent by email more quickly.

The source domain *the document* has been used to explain the target domain which is *zip*. This is shown in figure 4.4.10 below.

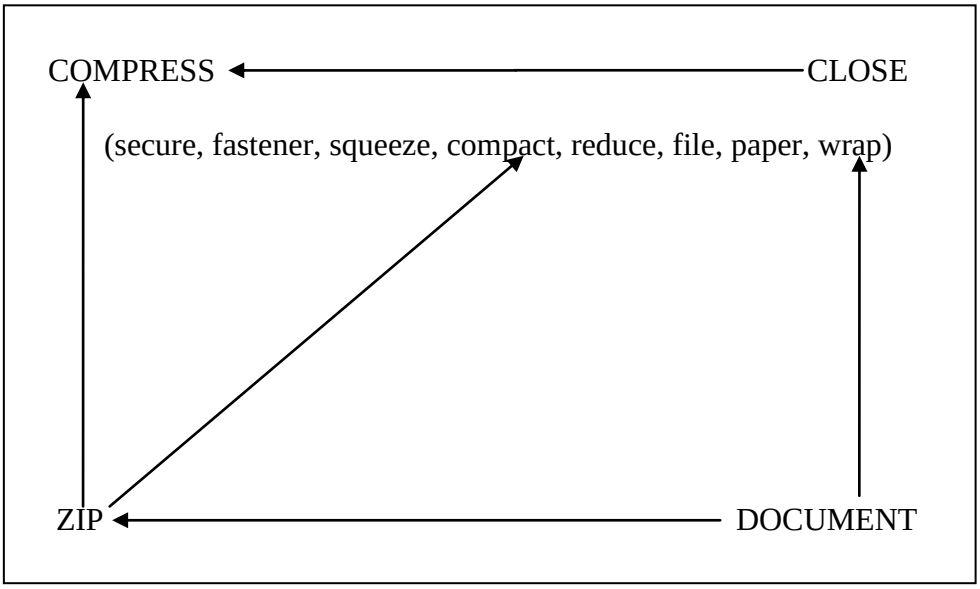


Figure 4.4.10: Mapping for the Zip Metaphor

A zip is a fastening device operating by means of two parallel rows of metal or plastic teeth on either side of a closure that are interlocked by a sliding tab. This expression in literal terms may mean closing a document or a situation where some documents are in a bag hence the need to close the bag. This may be done so that the documents do not fall off from the thing that is being used for carrying them or so that they are somewhat secure unlike if the bag, for example, is not closed hence exposing its contents. Documents in a bag may also be zipped so that

water does not destroy them, for example when it is raining. In computers, there are instances where certain documents are sent through the email in a process known as attaching. When attaching a document in an email, there is an allowable maximum size for the document. If the document is large or big in size, it can undergo a process known as zipping where a software is used to make the document small or compressed so that it can easily be attached and sent through email.

The attributes that are associated with this metaphor are *compressing* and *closing*. The concepts that are associated with the attributes are fastening, squeezing, compact, reduce, file, document and wrap.

The metaphor is *successful* since the meaning of zipping in terms of form and function are more or less the same in the case of a literal meaning as well as from the context of a computer. Both involve the closing of something so that they are secured. The 'software' that is used to close a bag or pair of trousers is the *zip* itself while in a computer, the software include *winzip* and *winrar*.

Conclusion

All but the card, plug and play, cell and port metaphors were successful in the way their meanings came out in explaining the concepts as used in normal contexts as well as in computing.

4.5 Analysis of the Respondent's Views of the Metaphorical Meanings of Expressions used in Computers

4.5.0 Introduction

The focus of the third objective was on the misinterpretations of the metaphors. The respondents gave their views on the metaphorical meanings of the expressions used in computers. The researcher identified the cases of misinterpretation of expressions used in computers. The responses from the lecturers as well as those from the students were compared with the ones from the dictionary. The ones which matched or were similar with the ones in the dictionary were considered correct interpretations while those that were incorrect were considered as misinterpretations.

The researcher analyzed and provided statistics as well as a summary of the misinterpreted expressions. There were respondents who did not respond to some of the questions. This is normal in research since a respondent cannot be forced to answer all the questions. McNabb (2004) recommends that a researcher should not force the respondents to give part or all the information in a research study. The findings for both the students and staff from both institutions were considered together since this was not a comparative study between IAT and KU. The analysis is done in alphabetical order as per the metaphors.

Table 4.5.1 below provides a quantitative summary of the percentages of the responses given.

Table 4.5.1 Computer/ Metaphorical Meaning of Expressions

No.	Metaphor	Correct answer (%)	Incorrect answer (%) (Misinterpretations)	No answer (%) (No response)
1	Memory	93.3	-	6.7
2	Port	83.3	10.0	6.7
3	Processor	60.0	20.0	20.0
4	Repeater	56.7	26.6	16.7
5	Chip	73.4	13.3	13.3
6	Bus	66.6	26.7	6.7
7	Host	92.0	-	8.0
8	Mouse	97.3	-	2.7
9	Card	66.6	26.7	6.7
10	Monitor	98.4	-	1.6
11	Menu Bar	88.3	2.7	9.0
12	Lock	86.6	6.7	6.7
13	Window	66.7	20.0	13.3
14	Virus	89.7	-	10.3
15	Sleep	73.3	20.0	6.7
16	Plug and Play	83.3	-	16.7
17	Bin	90.0	6.7	3.3
18	Driver	66.7	16.7	16.6
19	Zip	86.7	10.0	3.3
20	Cell	80.0	13.3	6.7

Source: Researcher (2018)

4.5.1 The Bin Metaphor

90.0% of the respondents were able to get the meaning of the *bin* metaphor, 6.7% did not answer while 3.3% got it wrong. In terms of misinterpretation, the response was that, while bins are applicable and used by human beings, they are not used in computers since there are no wastes to be thrown away.

4.5.2 The Bus Metaphor

The *bus* metaphor had 66.6% of the respondents correctly indicating the meaning of the metaphor, a slightly bigger percentage of the respondents at 26.7 % did not answer while 6.7% answered it incorrectly. In terms of misinterpretations, the respondents indicated that buses in a computer cannot run or move in a parallel line since they have different speeds. Other views were that computers do not have buses but instead paths through which signals are sent from one part of the computer to the other. They finalized that there are no parallel lines but invisible paths that signals use in a computer.

4.5.3 The Card Metaphor

66.6% of the respondents were correct in their answers on the *card* metaphor, 26.7 % did not answer while 6.7% were incorrect in their answers. The respondents misinterpreted the metaphor and remarked that cards are not fitted in slots but are in-built components, that is, they are fixed permanently in the computer's chassis.

The other varying response was that the slots in a computer are all of the same size and therefore the issue of fitting or size of a card and a slot should not arise.

4.5.4 The Cell Metaphor

80.0% of the respondents indicated correctly the meaning of the *cell* metaphor, 13.3 % did not answer while 6.7% got the answers wrong. In terms of misinterpretations, the responses were that a human cell cannot be expanded. In terms of computers, they argued that computers do not have cells since cells are a preserve of human beings and not machines.

4.5.5 The Chip Metaphor

Regarding the *chip* metaphor, 73.4% indicated correctly the meaning of the metaphor, 13.3 % did not answer while a similar percentage got the answer wrong. The misinterpretations by the respondents were that a chip could not be upgraded. This is not true since a computer chip can indeed be upgraded if its performance has gone down. They also mentioned that a computer chip is in-built and therefore the moment it dies or cannot function, then the computer's life will end hence one will need to buy another computer.

4.5.6 The Driver Metaphor

66.7% of the respondents indicated the correct meaning of the *driver* metaphor, 16.7 % did not answer while 16.6% were incorrect. The metaphor was problematic to the respondents in terms of its meaning. Many of them misinterpreted its meaning and a big number did not answer it.

The respondents misinterpreted the expression and mentioned that while human drivers may be corrupt, this corruption could not be extended to machines like computers since they do not have drivers. They argued that a computer is a machine which is started, used and shut down and therefore there was no point at which the element of corruption would come in.

4.5.7 The Host Metaphor

92.0% of the respondents indicated correctly the meaning of the expression while 8% did not answer. The respondents did not therefore misinterpret the metaphor.

4.5.8 The Lock Metaphor

With regard to the *lock* metaphor, 86.6% were correct, 6.7 % did not answer while a similar percentage did not get the responses correctly. The misinterpretation given was that a computer could not be locked. Instead, one needs to shut down the computer in case they are through with the task that they were doing.

4.5.9 The Memory Metaphor

93.3% of the respondents of the 50 respondents correctly indicated the meaning of the *memory* metaphor while 6.7 % did not answer. This shows that majority of the respondents were aware of the meaning of the metaphor and more so how memory is applicable in the computing world.

The memory metaphor was therefore not misinterpreted at all by the respondents.

4.5.10 The Menu Bar Metaphor

88.3% of the respondents indicated correctly the meaning of the metaphor, 2.7 % were incorrect while 9.0% did not answer. The misinterpretation was that a computer does not have a menu but rather the ‘options’ tool where a user can select the items that are to be used while working on a computer.

4.5.11 The Monitor Metaphor

In terms of the *monitor* metaphor, 98.4% indicated correctly the meaning while 1.6 % did not answer. No case of misinterpretation was reported save for the few who did not respond to the question.

4.5.12 The Mouse Metaphor

97.3% of the respondents were correct with regard to the *mouse* metaphor while 2.7 % did not

answer the question. The metaphor was not misinterpreted by the respondents.

4.5.13 The Plug and Play Metaphor

In terms of the *plug and play* metaphor, 83.3% of the respondents gave correct responses while 16.7% did not respond. The metaphor was not misinterpreted though the number of those who did not respond was high possibly indicating that they were unsure of the interpretation or its meaning.

4.5.14 The Port Metaphor

83.3% of the respondents were able to get the meaning of the *port* metaphor, 10.0% did not answer while 6.7% got it wrong. The misinterpretations were as follows: a computer's port cannot be big. This is not true since some ports are small while others are big but the key factor is what goes into the port in question. If one has an earphone to plug into a computer, then the USB port is said to be big since the earphone cannot fit into it. The other misinterpretation was where a port was confused with a connector. A connector is what goes into a port to establish a connection.

4.5.15 The Processor Metaphor

With regard to the *processor* metaphor, slightly over half of the respondents at 60.0% indicated correctly the meaning of the expression while 20.0 % did not answer with a similar percentage getting it wrong. This metaphor proved a bit problematic going by the percentage that did not answer the question and the ones who got it wrong. Regarding the misinterpretations, the respondents confused a processor with a system unit. A system unit houses most of the components in a computer including a motherboard and the processor itself. The processor was also confused with memory where the respondents indicated that it stores information.

4.5.16 The Repeater Metaphor

56.7% got the correct answer for the *repeater* metaphor, 26.6 % did not answer while 16.7% got it wrong. The metaphor was not well interpreted by the respondents based on the results and many did not provide answers to its meaning. Regarding the misinterpretations, the respondents confused a repeater with other network devices like a hub and a switch. They also mentioned that a repeater is used to connect two computers for purposes of communication. They did not mention the distance involved for the computers to communicate as well as the kind of cables used. A repeater is used in what is known as Ethernet networks.

4.5.17 The Sleep Metaphor

Regarding the *sleep* metaphor, 73.3% of the respondents were correct, 20.0% did not answer while 6.7% were incorrect. On the misinterpretations, the respondents said that computers could not be put to sleep since they are electronic devices. This is not true since a computer can be put in what is referred to as *sleep* mode by a user.

4.5.18 The Virus Metaphor

In terms of the *virus* metaphor, 89.7% of the respondents indicated correctly the meaning of the metaphor while 10.3% did not answer. The metaphor was therefore not misinterpreted.

4.5.19 The Window Metaphor

On the *window* metaphor, 66.7% gave correct responses, 20.0% did not respond while 13.3% gave wrong responses. With regard to the misinterpretations, the respondents asserted that one could close the window in a car or in a house but not in a computer. Others mentioned a window in a computer is invisible while the one in a house is visible. This is not true since a window in both cases is visible.

4.5.20 The Zip Metaphor

With regard to the *zip* metaphor, 86.7% indicated correctly the meaning of the metaphor, 10.0% did not answer while 3.3% gave wrong responses. With regard to the misinterpretation, the respondents mentioned that there is no connection or relationship between a computer and a zip. They mentioned that a zip is not found in computers but is found in clothes.

Conclusion

The findings showed that there were a number of metaphors which the respondents interpreted correctly. They include the *monitor* (98.4%), *mouse* (97.3%), *memory* (93.3%), *host* (92.0%), *virus* (89.7%), and *plug and play* metaphors (83.3%). The researcher observed that these are basic concepts in computers whose terminologies are used on a day to day basis or regularly hence the high rate of the correct responses and interpretations.

The respondents did not answer some of the questions. In terms of percentages, the *processor* metaphor was not responded to at a rate of 20.0%, *plug* and *play* and *repeater* metaphors at a rate of 16.7% in each case, *driver* metaphor 16.6%, *window* and *chip* metaphors at 13.3% in each case.

In terms of the metaphors which had the incorrect responses and which were analyzed as misinterpreted, the *bus* and *card* metaphors had 26.7% each of the responses, *repeater* had 26.6%, and the *processor*, *window* and *sleep* metaphors had a response rate of 20.0% in each case.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter discusses the summary of the findings, conclusions and recommendations for further study. The discussion was guided by three objectives namely: the analysis of computer metaphors in terms of the target and source domains; identification and analysis of computer metaphors that were successful and those that were unsuccessful, and finally, the identification of the cases of misinterpretation of expressions used in computers.

5.1 Summary of Findings

There were 20 expressions that were given to the respondents. 10 expressions from computer hardware and 10 from computer software were identified and analyzed in line with the objectives of the study. Data was obtained from 50 respondents who filled in the questionnaires.

5.1.1 Analysis of the Metaphors in Terms of the Target and Source Domains

The Conceptual Metaphor Theory was used. In it, the expressions were identified in terms of the target and source domains. A mapping of the expressions was then done. The researcher looked at some of the attributes associated with the target and source domains. The attributes in this case refer to the features that are part of the items that were discussed in the target and source domains. The analysis of the

source and target domains for each of the metaphors was illustrated using figures. The figures captured the different domains alongside the attributes for each of the domains. In the expression, *the driver is corrupt*, for example, it was noted that the source domain *corrupt* was used to explain the target domain *the driver*. Lakoff and Johnson (2003) in their theory noted that the mapping of metaphorical expressions took the uni-directional approach. This means that the mapping was done from the source domain to the target domain and not from the target domain to the source domain. The findings noted that all the analysis of the expressions was done in this way.

The findings also observed that, as had been proposed by Lakoff and Johnson (2003), the mapping that used the CMT theory was supposed to be a one-to one-mapping. This is what was adopted in all the analysis.

The analysis of the expressions in terms of the target and source domains also brought in a perspective as to whether the metaphors were successful or not. Those metaphors which succeeded in bringing understanding to the real life of the meaning of the expressions were considered to be successful while those which did not were considered unsuccessful. A number of metaphors were successful in the way their meanings came out both from the literal context and from the context of a computer.

From the findings, 15 metaphors were considered to be successful in relaying the literal and metaphorical meanings. These included: memory, processor, chip, bus, mouse, card, monitor, menu bar, window, virus, sleep, bin, driver, lock and zip metaphors. 5 metaphors were considered unsuccessful. They included: port, RAM, hard disk, plug and play and cell metaphors.

5.1.2 Identification and Analysis of Computer Metaphors that were Successful and those that were Unsuccessful

All the metaphors except the *card, plug* and *play*, *cell* and *port* metaphors were successful in the way their meanings came out in explaining the concepts as used in normal contexts as well as in computing.

Some of the successful metaphors were the bus metaphor. The metaphor was *successful* since the term *bus* involves the aspect of *movement* or *transportation*. The *memory* metaphor was also *successful* in the way it relates its attributes and its relationship to the literal memory. Just like a person's memory can be increased or enhanced, a computer's memory is normally increased to enhance the performance and functionality of a computer.

The card metaphor, for instance, was *not successful* because a card in the normal usage may or may not have to be fitted into a slot for it to be used. On the other hand, a computer's card must be fitted into its pre-designed slot for it to be used successfully.

The *plug* and *play* metaphor is not successful since there is no relationship between plug and play as used in computers and as it applies in the normal usage. The machines or devices that work automatically in real life are not necessarily referred to as plug and play devices. Marcus (2015) observes that *plug* and *play* is not well designed as a metaphor and therefore does not provide so much help to users in terms of its understanding.

A cell is an important part of a human being that has life. Human beings have different types of cells that work in unison to ensure the sustenance of life, for example, red blood cells, white blood cells, among others. In computing, a *cell* refers to an intersection between rows and columns or a small square in a pattern of squares in a computer spreadsheet that is used for typing numbers or words. The term *cell*, therefore, connotes different meanings from the normal as well as its usage in computers. The metaphor was therefore not *successful*.

The *port* metaphor is *not successful* since the mention of the word port in a literal way does not relate easily with a connection point as it is in the context of a computer.

5.1.3 Misinterpretation of Expressions Used in Computers

The findings showed that there were a number of metaphors which the respondents interpreted correctly. They include the *monitor* (98.4%), *mouse* (97.3%), *memory*

(93.3%), *host* (92.0%), *virus* (89.7%), and *plug and play* metaphors (83.3%). The researcher observed that these are basic concepts in computers whose terminologies are used on a day to day basis or regularly hence the high rate of the correct responses and interpretations.

The respondents did not answer some of the questions. In terms of percentages, the *processor* metaphor was not responded to at a rate of 20.0%, *plug* and *play* and *repeater* metaphors at a rate of 16.7% in each case, *driver* metaphor 16.6%, *window* and *chip* metaphors at 13.3% in each case.

In terms of the metaphors which had the incorrect responses and which were analyzed as misinterpreted, the *bus* and *card* metaphors had 26.7% each of the responses, *repeater* had 26.6%, and the *processor*, *window* and *sleep* metaphors had a response rate of 20.0% in each case.

5.2 Conclusion

The Conceptual Metaphor Theory can indeed be used to analyze metaphors in the area of computers and especially with regard to their target and source domains.

It was also noted that the wordings and expressions in computers rely on language and that this language is sometimes presented by the use of metaphors. It was therefore concluded that the domain of computers is rich in metaphors. It was noted that the manufacturers of computer hardware and software use words or phrases that are known to people to refer to the abstract concepts that they have

developed and continue to develop. A case in point is the *memory* and *monitor* metaphors, for example, in the case of computer hardware; and *virus* and *driver* metaphors, in the case of software.

16 out of the 20 metaphors were successful while 4 were unsuccessful. This shows that the developers tried to relate the words to the ones that people can relate with.

Finally, there were cases of misinterpretations which implied that the concepts in computers are metaphorical.

5.3 Recommendations for Further Research

It is recommended that a study should be done to ascertain if all the words, phrases and expressions used in computer hardware and software are metaphorical or if some are not. This will help in coming up with a conclusion, for example, that a computer and its related concepts is a metaphor. If this is so, it may help in the development of a computer dictionary that explains all the computer metaphors so that computer users will find it easy to understand the computer terminologies that they are bound to encounter while interacting with a computer.

The field of computer has a number of branches or specialization areas. What has been noted is that linguistics has played and continues to play an important role in this area. The names of items, the descriptions of different concepts all rely on language. Further research should therefore be done on how metaphors have been

used in the areas such as internet, networking, programming, databases and any other IT area.

Another study should also be done to ascertain and analyze how metaphors have been used in the social media in the areas such as Twitter, Telegram, Facebook, WhatsApp, Instagram, amongst others. This is because this media has become so popular for communication purposes and therefore the language used when communication is taking place on these platforms should be researched on to determine the level of the usage of metaphors, if at all there are metaphors used.

Computer designers and manufacturers rely on language when it comes to naming of concepts. Because of the misinterpretations of certain words, the manufacturers need to do more research and come up with names from the environment that users can relate with so that cases of misinterpretations are minimized, or if possible, eradicated completely. They should do a pilot study before coming up with the names of the concepts.

Finally, the policy makers in ICT and the government through the Kenya Institute of Curriculum Development (KICD) and other relevant bodies and think tanks, for instance, should research and come up with a curriculum in ICT studies and ICT materials that are learner friendly because of the fact that the domain of computer contains numerous metaphors.

REFERENCES

Ansah, G. (2010). The Cultural Basis of Conceptual Metaphors: The Case of Emotions in Akan and English. *Papers from the Lancaster University Postgraduate Conference in Linguistics & Language Teaching (*pp 1-25). Lancaster University, Lancaster.

Aristotle (1927). *The Poetics*. Loeb Classical Library. Cambridge: Harvard University Press.

Barlow, J.M., Kerlin, J.R., & Pollio, H.R. (1971). Training Manual for Identifying Figurative Language (Technical Report #1). *Metaphor Research Group, University of Tennessee,Knoxville.*

Barr, P. (2003). *User- Interface Metaphors in Theory and Practice*. Wellington, New Zealand: Victoria University of Wellington.

Berber, S.T. (2006). 'A Tagger for Metaphors', Paper given at the Sixth Researching and Applying Metaphor (RAAM) Conference, Leeds University.

Boyd, D. (2012). Critical Questions for Big Data: Provocations for a Cultural, Technological, and Scholarly Phenomenon. *Information, Communication & Society, 15 (5), 662 – 679. doi:10.1080/1369118X.2012.678878*.

Burns, N., & Grove, S. K. (1997). *The Practice of Nursing Research Conduct, Critique and Utilization*. Philadelphia: W.B. Saunders and Co.

Casnig, J. D. (2013). *A Language of Metaphors*. Kingston, Ontario, Canada: Knowgramming.com.

Cohen, F.B. (1990). *A Short Course on Computer Viruses*. Pittsburgh: ASP Press.

Coulson, S. (1996). The Menendez Brothers Virus: Analogical Mapping in Blended Spaces. Goldberg, Adele, ed. *Conceptual Structure, Discourse, and Language*. Stanford: CSLI, 67–81.

Croft, W., & Cruse, D.A. (2004). *Cognitive Linguistics*. Cambridge: Cambridge University Press.

Douglas Engelbart, Computer Visionary and Inventor of the Mouse, dies at 88 - The Washington Post. (n.d.). Retrieved from https://www.washingtonpost.com/business/douglas-engelbart-computer-visionary-and-inventor-of-the-mouse-dies-at-88/2013/07/03/1439b508-0264-11e2-9b24-ff730c7f6312_story.html?utm_term=.4a328d714f8e

Emery, N. J., & Clayton, N. S. (2001). Effects of Experience and Social Context on Prospective Caching Strategies in Scrub Jays. Nature 414, 443–446.

Faber, P. (Ed.). (2012). *A Cognitive Linguistics View of Terminology and Specialized Language*. Berlin, Germany: De Gruyter.

Fauconnier, G., & Turner, M. (2002). *The Way We Think*. New York: Basic Books.

Fineman, B. (2004). Computers as People: Human Interaction Metaphors in Human-Computer Interaction. Carnegie Mellon University Master's Thesis.

Gachara, M. (2012). *Gĩkũyũ Metaphors of Marriage Negotiations: A Cognitive Linguistics Perspective.* (Unpublished doctorate thesis), Kenyatta University, Kenya.

Gathigia, M.G. (2014). *Metaphors of Love in Gĩkũyũ: Conceptual Mappings, Vital Relations and Image Schemas.* (Unpublished doctorate thesis), Kenyatta University, Kenya.

Gentner, D., & Bowdle, B. (2001). Convention, Form and Figurative Language Processing. *Metaphor and Symbol, 16, 223-247.*

Gentner, D., & Bowdle, B. (2005). The Career of Metaphor. *Psychological Review, 112, 195-216.*

Gibbs, R.W. (2000). Making Good Psychology out of Blending Theory. *Cognitive Linguistics, 11,* 347-358.

Glucksberg, S., & Gildea, P. (1983). On Understanding Metaphor. The Role of Context. *Journal of Verbal Learning and Verbal Behavior, 22,577-590.*

Glucksberg, S., & McGlone, M. S. (1999). When Love is not a Journey: What Metaphors Mean. *Journal of Pragmatics,* 31, 1541–1558.

Griffiths, P. (2006). *An Introduction to English Semantics and Pragmatics*. Edinburgh: Edinburgh University Press.

Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change.* New York: Guilford Press, pp. 157–158.

Indurkhya, B. (1992). *Metaphor and Cognition*. Dordrecht, The Netherlands: Kluwer Academic Publishers.

Johnson, S. (1997). *Interface Culture: How New Technology Transforms the Way We Create and Communicate*. San Francisco: Harper San Francisco.

Kinshuk. (2016). *Designing Adaptive and Personalized Learning Environments*. Abingdon, United Kingdom: Routledge.

Kobia, J.M. (2008). Metaphors on HIV/AIDS discourse among Oluluyia speakers of Western Kenya critical approaches to discourse analysis across disciplines. *Critical Approaches to Discourse Analysis across Disciplines, 2(2), 48 –66.*

Kombo, D.K., & Tromp, D.L.A. (2006). *Proposal and Thesis Writing: An Introduction*. Nairobi: Paulines Publications Africa.

Kövecses, Z. (1986). *Metaphor of Anger, Pride and Love. A Lexical Approach to the Structure of Concepts*. Amsterdam: John Benjamins.

Kövecses, Z. (2002). *Metaphor: A Practical Introduction*. Oxford: Oxford University Press.

Kövecses, Z. (2003). *Metaphor and Emotion*. Budapest, Hungary: Eötvös Loránd University.

Kövecses, Z. (2009). *Metaphor: A Practical Introduction*. Oxford: Oxford University Press.

Lakoff, G., & Johnson, M. (1980). *Metaphors we Live By*. Chicago: University of Chicago Press.

Lakoff, G., & Turner, M. (1989). *More than Cool Reason. A field guide to poetic metaphor*. Chicago: University of Chicago Press.

Lakoff, G. (1992). *The Contemporary Theory of Metaphor*. Berkeley: University of California.

Lakoff, G., & Johnson, M. (2003). Metaphor and War, Again. Retrieved from: http://www.alternet.org/story/15414.

Machakanja, I. (2006). *Conceptual Metaphors in English and Shona. A Cross-Linguistic and Cross-Cultural Study* (Unpublished PhD Thesis), Pretoria: University of South Africa.

Mason, Z. (2004). Cormet*:* A Computational, Corpus-Based Conventional Metaphor Extraction System. *Computational Linguistics*, 30(1):23–44.

Marcus, A. (2015). *Design, User Experience, and Usability: Design Discourse*. Berlin: Springer.

Mensah, E.O. (2012). The Yutong Bus: Representations of a New Ghanaian Political Metaphor. *Theory and Practice in Language Studies, 2 (1), 118-125*.

Macmillan English Dictionary for Advanced Learners. http://www.macmillandictionaries.com/dictionary-online/

McNabb, D.E. (2004). *Research Methods for Political Science: Quantitative and Qualitative Methods*. New Delhi: Prentice Hall of India.

Miles, M.B., & Huberman, A.M. (1994). *Qualitative Data Analysis.* California: Sage, Thousand Oaks.

Mugenda, O.M., & Mugenda, A.G. (1999). *Research Methods, Quantitative and Qualitative Approaches*. Nairobi: African Centre for Technology Studies Press.

Mugenda, O. M., & Mugenda, A. G. (2003). *Research Methods: Quantitative & Qualitative Approaches.* Nairobi: African Centre for Technology Studies Press.

Murphy, L. M. (2010). *Lexical Meaning*. Cambridge: Cambridge University Press.

Obeng, S. G. (1997). Language and Politics: Indirectness in political language. *Discourse and Society, 8*(1), 49–83.

Orodho (2003). *Essentials of Educational and Social Sciences Research Methods*. Nairobi: Masola Publishers.

Orwenjo, D.O. (2010). Of shifting Goal-Posts and Scoring Own Goals: Patterns of Metaphorical Language Use in Kenya's Political Discourse. In D.O Orwenjo & J.O. Ogone (Eds.), *Language and Politics in Africa: Contemporary Issues and Critical Perspectives* (pp.52-81). Cambridge: Cambridge Scholars Publishing.

Peter, G. A. (1997). *The Language of Metaphors*. London: Routledge.

Radden, G., & Dirven, R. (2007). *Cognitive English Grammar*. Amsterdam / Philadelphia: John Benjamins Publishing Company.

Ritchie, J., Lewis, J., & Elam, G. (2003). Designing and Selecting Samples. In J. Ritchie & J.Lewis (Eds.), *Qualitative Research Practice. A Guide for Social Science Students and Researchers* (pp.77-108). Thousand Oaks, CA: Sage.

Rubin, D.B. (1987). *Multiple Imputations for Nonresponse in Surveys.* New York: Wiley.

Rundell, M., & Fox, G. (2002). *Macmillan English Dictionary for Advanced Learners*. Oxford: Macmillan Education Ltd.

Semino, E. (2008). *Metaphor in Discourse.* New York: Cambridge University Press.

Steen, G. J., Dorst, A. G., Herrmann, J. B., Kaal, A. A., Krennmayr, T., & Pasma, T. (2010). *A Method for Linguistic Metaphor Identification: from MIP to MIPVU*. Amsterdam: John Benjamins.

Steen, G. J. (2011). The Contemporary Theory of Metaphor-now new and improved. *Review of Cognitive Linguistics*, 9(1), 26-64.

Steen, G. J. (2007). *Finding Metaphor in Grammar and Usage: A Methodological Analysis of Theory and Research*. Amsterdam: John Benjamins.

State University of New York/Purchase (1987). *The Window in Twentieth Century Art*, exhibition catalogue Neuberger Museum.

Turner, M. (1996). *The Literary Mind: The Origins of Language and Thought.* New York: Oxford.

Wardhaugh, R. (2006). *An Introduction to Sociolinguistics*. Oxford: Blackwell.

White, R. (2001). *How Computers Work* (8th ed.) Que: Indianapolis.

Wilkinson, P.R. (2002). *Thesaurus of Traditional English Metaphors* (2nd ed.). New York: Routledge.

Wilson, D. (2010). Parallels and Differences in the Treatment of Metaphor in Relevance Theory and Cognitive Linguistics. 11th Conference of the Pragmatics Society of Japan.

Yin, R. K. (2003). *Case Study Research: Design and Methods* (3rd ed.). Thousand Oaks, CA: Sage.

http://www.macmillandictionary.com (last accessed on 20th July 2016).

http://whatis.techtarget.com (last accessed on 20th July 2016).

APPENDICES

Appendix 1: Letter of Authorization

Appendix 2: Questionnaire

INTRODUCTION

Hello:

You are invited to participate in the research.

Your participation in this study is completely voluntary.

The information provided will be used strictly for research purposes only. Your information will be coded and will remain confidential.

Thank you very much for your time and support.

For each of the italicized expressions below, explain your understanding of:

(i) the meaning as used in computers.

DEMOGRAPHIC INFORMATION

1. Designation

Lecturer ☐ Student ☐

SECTION A: HARDWARE

1. *The memory should be increased* to improve performance.

   ……

   ……

   ……

2. *The port is big*.

   ……

   ……

3. *The processor fits into the socket*.

   ……

   ……

   ……

4. *The repeater is faulty*.

   ……

   ……

   ……..

5. *The chip needs to be upgraded*.

   ……

   ……

   ……

6. *Buses run in parallel lines.*

   ……

   ……

   ……...

7. *The host is accessible.*

   ……

   ……

   ……...

8. *The mouse button is tapped* to execute commands.

   ……

   ……

   ……...

9. *The card cannot fit* in the slot.

   ……

   ……

   ……

10. When *a monitor is shaky,* it needs to be replaced.

……

……

……

SECTION B: SOFTWARE

1. *Go to the menu bar* and click on the ‘open’ button.

……

……

……

……

2. *Lock the computer* to safeguard information.

……

……

……

3. After saving the document, *close the window*.

……

……

……...

4. The computer has been *infected by a virus*.

……

……

……

……

5. *Put the computer to sleep*.

……

……

……

6. *The device is plug and play*.

……

……

……

……

7. When full, one should *empty the bin*.

……

……

……

8. The keyboard cannot work because *the driver is corrupt*.

……

……

……

9. *Zip the document* before sending it through email.

……

……

……

……

10. To make the figures visible, *expand the cell.*

……

……

……

……

THANK YOU FOR YOUR PARTICIPATION

Appendix 3: Excerpts from online computer articles from where metaphorical expressions were extracted

1. **Memory**

Memory (RAM) and its influence on performance

It's been proven that ***adding more memory to a computer system increases its performance.*** If there isn't enough room in memory for all the information the CPU needs, the computer has to set up what's known as a virtual memory file. In so doing, the CPU reserves space on the hard disk to simulate additional RAM. This process, referred to as "swapping", slows the system down. In an average computer, it takes the CPU approximately 200ns (nanoseconds) to access RAM compared to 12,000,000ns to access the hard drive. To put this into perspective, this is equivalent to what's normally a 3 1/2 minute task taking 4 1/2 months to complete!

Reference

Memory (RAM) and its influence on performance. (n.d.). Retrieved from http://www.computermemoryupgrade.net/memory-influence-on-performance.html

2. **Port**

How to replace a (USB) port in a Computer

By Andrew Macauley

If something goes wrong with one of your ***USB ports, or if you simply need more connections, it isn't too difficult to replace*** the part on your own so long as you have a little mechanical expertise. All you need is an appropriate new USB card--a PCI slot compatible card for USB ports in the back and a screwdriver.

Reference

How to Replace a USB in a Computer | Techwalla.com. (n.d.). Retrieved from

https://www.techwalla.com/articles/how-to-replace-a-usb-in-a-computer

3. **Processor**

Do All Intel Processors Fit the Same Motherboard?

by Ashley Poland

CPU Socket

Every motherboard has a CPU socket -- and different Intel processors use different socket types. These socket types are defined by number and name, usually something like "Socket 423." Say, for instance, you have an old computer that came with a Pentium 4. ***The socket used for the Pentium 4 (Socket 423)***

would not fit the Intel Core i7 CPU, which uses the LGA1366/Socket B type socket. Earlier CPU sockets were more flexible, with several different sockets working with the same processor. ***New processors generally only fit into one socket type***.

Reference

Do All Intel Processors Fit the Same Motherboard? | It Still Works. (n.d.).

Retrieved from

http://itstillworks.com/intel-processors-fit-same-motherboard-31465.html

4. **Repeater**

Repeater in Computer Networking

by

Bradley Mitchell

Updated December 19, 2017

Network repeaters receive and retransmit incoming electrical, wireless or optical signals.

Reference

https://www.lifewire.com/definition-of-repeater-816359

5. **Chip**

How to Determine if BIOS Update is Needed

Do you need to update the BIOS on your computer?

Just because there is an update for your BIOS does not mean that you should necessarily install it. It's a myth that BIOS updates somehow make your computer faster or run better. In some rare instances, a BIOS update can fix a motherboard issue that might make your computer perform better, but it's usually not related to speed.

Reference

How to Determine if BIOS Update is Needed. (n.d.). Retrieved from http://www.online-tech-tips.com/cool-websites/determine-if-bios-update-is-needed/

6. **Bus**

Computer bus

Buses can be parallel buses, which carry data words striped across multiple wires, or serial buses, which carry data in bit-serial form. The addition of extra power and control connections, differential drivers, and data connections in each direction

usually means that most serial buses have more conductors than the minimum of two used in the I²C serial bus.

Reference

Kids.Net.Au - Encyclopedia > Computer bus. (n.d.). Retrieved from http://encyclopedia.kids.net.au/page/co/Computer_bus

7. **Host**

A host is a computer that is accessible over a network. It can be a client, server, or any other type of computer. Each host has a unique identifier called a hostname that allows other computers to access it.

Reference

https://techterms.com/definition/host

8. Mouse

Double-click is a term used to describe the process of quickly pressing a mouse button twice while keeping it still. In most cases, a double-click is with the left mouse button and is used to open a file, folder, or software program.

Reference

What is Double-click? (n.d.). Retrieved from https://www.computerhope.com/jargon/d/doublecl.htm

9. Card

PCMCIA Cards Do Not Fit in the ExpressCard Slot on a Dell Laptop Computer

ExpressCard, a new PCMCIA format, does not fit in the traditional PCMCIA card slots. ExpressCard is a new technology that replaces older and more limited PCMCIA technology. Unlike the larger PCMCIA slots that until recently were commonly found in almost all laptops, the new ExpressCard slots are more compact and accommodate the smaller ExpressCards

Reference

PCMCIA Cards Do Not Fit in the ExpressCard Slot on a Dell Laptop Computer | Dell US. (n.d.). Retrieved from http://www.dell.com/support/article/us/en/04/SLN49444/pcmcia-cards-do-not-fit-in-the-expresscard-slot-on-a-dell-laptop-computer?lang=EN

10. Monitor

How to Fix a Shaking Computer Screen

by Josh Fredman

It's easy to take technology for granted -- until something goes wrong with it. Some problems are more disruptive than others, like computer screen performance issues. Screen problems can be particularly frustrating because computer use is an overwhelmingly visual activity, and when the screen doesn't work properly, it can

significantly degrade the quality of the user's experience. One fairly common problem is a "shaky" screen appearance, which is generally annoying and can cause headaches and eye strain. Fortunately, even though a variety of sources can cause this problem, the fix is usually simple and quick.

Reference

How to Fix a Shaking Computer Screen | Chron.com. (n.d.). Retrieved from http://smallbusiness.chron.com/fix-shaking-computer-screen-65404.html

11. Menu Bar

The menu bar is the part of a browser or application window, typically at the top left side, that houses drop-down menus that allow the user to interact with the content or application in various ways. In Microsoft Word, for example, the "File" menu, for example, provides options to open a file, create a new one, and save or print -- among others. The "Edit" menu allows the user to perform such functions as copying and pasting, finding and replacing text.

Reference

What is menu bar? - Definition from WhatIs.com. (n.d.). Retrieved from http://whatis.techtarget.com/definition/menu-bar

12. Lock

How To Password Lock a Computer

Computer users should provide protection to the contents of their computer from being accessed and used by unauthorized users. Confidential and private files must remain such and free from the scrupulous eyes of other users. The security and privacy of computer files can be protected and ensured in various ways and one of the most commonly practiced security tool is the use of passwords to lock and unlock the computer. Locking the computer allows a user to maintain open and running all the current applications on the computer and at the same time hidden from other parties. The computer can be locked in various ways such as the "CTRL-ALT-DEL" Lock, the "Screensaver Lock" and the "Quickstart Lock". Computers may also have different modes of providing security locks depending on the Operating System installed in the computer such as computers using the Windows XP system which can be locked via a shortcut menu, command file, bat line, or the keyboard.

Reference

How To Password Lock a Computer - How To Articles. (n.d.). Retrieved from http://www.liutilities.com/how-to/password-lock-a-computer/

13. Window

wikiHow to Close Windows

Learning how to close windows on your computer and in various Internet browsers can help you save time, especially if you have multiple windows or applications open on your desktop.

Reference

5 Ways to Close Windows - wikiHow. (n.d.). Retrieved from http://www.wikihow.com/Close-Windows

14. Virus

A computer virus is a computer program that can replicate itself and infect a computer. Computer viruses were labeled as viruses because of the fact that they are similar to biological viruses in the aspect of multiplying themselves. Similarly they find a host and then infect and multiply themselves.

Reference

An introduction to computer viruses: problems and solutions: Library Hi Tech News: Vol 29, No 7. (n.d.). Retrieved from http://www.emeraldinsight.com/doi/full/10.1108/07419051211280036

15. Sleep

PSA: Don’t Shut Down Your Computer, Just Use Sleep (or Hibernation)

by Chris Hoffman on May 27th, 2016

In this day and age, there’s no reason to shut down your computer, then sit through the boot-up process when you want to use it. Save yourself time by putting your computer to sleep or hibernating it instead.

Reference

PSA: Don’t Shut Down Your Computer, Just Use Sleep (or Hibernation). (n.d.). Retrieved from https://www.howtogeek.com/256395/psa-don%E2%80%99t-shut-down-your-computer-just-use-sleep-or-hibernation/

16. Plug and Play

What does it mean for a device to be 'plug-and-play' or 'class-compliant'?

A class-compliant device (also known as plug-and-play) is one that doesn't require extra drivers to connect your Windows or Macintosh computer, or to your iPad. These devices use drivers which are built into the host (i.e. the computer or the iPad) operating system. If your device connects automatically to any computer without requiring you to install drivers from a website or a disk, it is probably class-compliant/plug-and-play.

Reference

What does it mean for a device to be 'plug-and-play' or 'class-compliant'? (n.d.). Retrieved from http://headrushfx.com/kb/article/2307

17. Bin

How to empty your Recycle Bin

Your Recycle Bin is an area of your hard drive where you store ‘deleted’ files. As files can be recovered from the bin they still occupy your computer's hard disk space.

That's why it's worth emptying the Recycle Bin manually now and then. You can even make your computer work faster by emptying this bin regularly.

Reference

How to empty your Recycle Bin – Computing Helpdesk. (n.d.). Retrieved from https://computing.which.co.uk/hc/en-gb/articles/207049635-How-to-empty-your-Recycle-Bin

18. Driver

How to Fix a Corrupt Driver

by Lita McLeary

A corrupt driver is simply one that has become unusable or inoperable. When a driver is corrupted, the device that it controls also becomes inaccessible. It is

necessary to fix a corrupt driver as soon as it is detected to prevent your computer from malfunctioning.

Reference

How to Fix a Corrupt Driver | Techwalla.com. (n.d.). Retrieved from https://www.techwalla.com/articles/how-to-fix-a-corrupt-driver

19. Zip

How to Zip a File or Folder in Windows 10

by Melanie Pinola | August 26, 2015

Zipping files compresses them so they take up less space on your hard drive, and the smaller ZIP files can more quickly be shared with others or transferred to other computers.

Reference

How to Zip a File or Folder in Windows 10. (n.d.). Retrieved from https://www.laptopmag.com/articles/how-to-zip-files-windows-10

20. Cell

Adjust text to fit within an Excel cell

by Mary Richardson | August 23, 2005

Microsoft Excel's AutoFit feature is great when you need to resize a cell to display more text than the cell currently allows. But when you can't change the size of a cell to fit the text, this tip shows how you can resize the text to fit within the cell.

When text is too long to display in a label cell, you can use Microsoft Excel's AutoFit feature to enlarge the cell enough to fit the contents. But this can result in too much white space in the rest of the row or column.

Reference

Richardson, M. (n.d.). Adjust text to fit within an Excel cell - TechRepublic. Retrieved from https://www.techrepublic.com/article/adjust-text-to-fit-within-an-excel-cell/

Appendix 4: Research Budget

Proposal	
Item	**Budget (Kshs)**
Binding	3000
Internet	5000
Printing and photocopying	4000
Stationery	3000
Telephone costs	3000
Transport	4000
Miscellaneous	2000
Grand total	**24000**

N/B: The above budget will be financed by the researcher.

Appendix 5: Time Schedule

Period	**Activity**
March 2015	Concept Development.
April 2015 - February 2016	Pre-Proposal Development.
March 2016	Proposal Presentation and Defense.
April - May 2016	Review, Corrections and Formatting.
June 2016	Data Collection.
July 2016	Data Analysis.
August 2016- October 2018	Reviews, Corrections and Formatting of the Project.
November 2018	Printing, Binding and Submission of Dissertation.
December 2018	Graduation.