FACULTY MANAGEMENT PRACTICES OF DIGITAL GREY LITERATURE IN AN OPEN ACCESS CONTEXT AT STRATHMORE UNIVERSITY, KENYA

BY

RUTH N. GIBENDI

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ELDORET

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DECLARATION

DECLARATION BY THE STUDENT

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

Ruth Nyagano Gibendi

IS/MPHIL/049/09

Signed…… Date…….

DECLARATION BY SUPERVISORS

This research project has been submitted with our approval as the University Supervisors.

Dr. Damaris Odero

Department of Library, Records Management and

Information Studies

Signed..... Date…….

Prof. Joseph Kiplang'at

Department of Library, Records Management and

Information Studies

Signed..... Date…….

DEDICATION

To my Mother.
You have always loved me ... unconditionally.

ABSTRACT

Digital grey literature is an important output that deserves management by libraries. The tools for achieving this frequently relinquish this task to the creators of the works with general poor results. The aim of this study was to examine organization and dissemination practices accorded to digital grey literature by faculty, and their underlying motivations with a view of providing a framework for improving its management by the library. The objectives of the study were to identify digital grey literature produced, assess the organization and dissemination practices accorded to it, understand motivations of the choice of these practices and therefore suggest a framework for improving grey literature management for the library. The study adopted Actor Network Theory (ANT), Social Network Theory (SET) and Social Capital (SC) as viewing lens. The study employs an interpretive case, with Strathmore University as the unit of study. Stratified followed by purposive sampling was conducted for the full time faculty spread across four disciplinary areas. Data was collected using in-depth semi-structured interviews. A total of 21faculty were interviewed. Recorded interviews were transcribed, coded and analyzed thematically based on factors derived from the theories used. The results indicate that faculty produce and share a variety of digital grey literature outputs, which are elusive to define, even to themselves. They use existing technology such as e-mail, e-learning and online cloud storage services to organize their works for future retrieval. Faculty share the digital grey literature they produce with the official disseminating agencies of the works based on mandates and expectations, with colleagues based on trust relations and need and with students for teaching functions. Faculty are not aware of subject repositories in their disciplines, though they have used them online to retrieve works. Faculty interviewed had only done mediated deposits to the institutional repository. They perceive additional time and effort, skills, copyright concerns and quality concerns to be key deterrents to sharing their works online. They envisage professional recognition, publicity and citations as a benefit of sharing their digital grey literature, but acknowledge that this can only be derived from subject repositories and not institutional repositories. Predatory publishers are identified as an emerging cost in digital grey literature sharing in institutional repositories. An atmosphere of trust and open communication channels is perceived to positively influence a sharing culture. Faculty perceive the librarians as competent and can be entrusted with their digital grey literature works. The study concludes that for proper digital grey literature management to be achieved, librarians must be ready to mitigate the costs and offer the benefits envisaged by faculty: professional recognition, publicity and citations. The study recommends that librarians adopt a holistic approach to grey literature management and not limit themselves to institutional repositories. They will need to extend the mediated deposits to subject repositories and metric based systems such as Google Scholar so as to give faculty the benefits they desire from sharing digital grey literature to a global audience, and minimize identified and emerging costs.

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LIST OF ACRONYMS

ADS: Archaeology Data Service

ANT: Actor Network Theory

CCLR: Council for the Central Laboratory of the Research Councils

e-SCF: electronic Scientific Communication Forums

ICT: Information Communications Technology

IR: Institutional Repositories

ISO: International Organization for Standardization

IT: Information Technology

JISC: Joint Information Systems Committee

NCSTRL: Networked Computer Science Technical Reference Library

NTRS: NASA Technical Reports Server

OA: Open Access

OAI-PMH: Open Archives Metadata Harvesting Protocol

OER: Open Educational Resources

SC: Social Capital

SET: Social Exchange Theory

SU: Strathmore University

TAM: Technology Acceptance Model

URL: Uniform Resource Locator

XML: Extensible Markup Language

DEFINITION OF OPERATIONAL TERMS

Academic Grey Literature: That which is produced by faculty or staff in the university, for the purpose of sharing scholarly information with others. It is also known as scholarly grey literature.

Faculty: Academic staff in an institution. In this study it encompasses Professors, Senior Lecturers, Lecturers and Assistant Lecturers.

Grey Literature: Grey literature is defined as that which is produced at all levels by government, academia, business and industry, both in print and electronic formats, but which is not controlled by commercial publishing interests, and where publishing is not the primary business activity of the organization.

Grey Literature Management: A set of activities and services that encompasses the production, organization, dissemination and preservation of grey literature. For digital grey literature, institutional repositories, subject repositories, author self-archiving web pages, departmental web sites and entries in library catalogues are employed to achieve the organization, dissemination and preservation functions.

Institutional Repository (IR): A set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term

preservation where appropriate, as well as organization and access or distribution (Lynch, 2003, p.328).

Open Access (OA): Open Access is the free, immediate, online availability of research articles combined with the rights to use these articles fully in the digital environment. (SPARC, 2018). Gold Open access is attained by publishing in Open Access journals, while Green Open Access is attained by publishing in a journal that allows the author to archive a version of the work (typically in an institutional or subject repository, or a self archiving author web page).

Self Archiving Web Pages: An author website that provides an electronic posting of author-supplied research without publisher mediation. Is one of the ways of attaining green open access.

Subject Repositories: Digital service for management of research outputs (peer reviewed or not) defined by related subject areas or disciplines. They often offer services similar to institutional repositories and more depending on the discipline. Examples include Arxiv, SSRN and RePec.

CHAPTER ONE

INTRODUCTION AND BACKGROUND INFORMATION

A world-renowned story is told of Archimedes, an ancient Greek scholar, who was tasked by the then king to identify the purity of a cast gold crown, which the king suspected had been adulterated by silver. With the discovery that volume of water displaced by him as he sat on the bath tub must be equal to the volume of the part of his body had submerged, he leapt out of his bathtub and ran through the streets of Syracuse naked. He could not wait. It is said that Archimedes must have been so eager to share this new discovery. That is the *eureka* moment that comes with research and discovery.

Centuries later, scientific research remains a quintessentially universal public record of human achievement that should transcend political, sociological, cultural, and linguistic boundaries. But the 'eureka!' moment celebration style has changed. It is now celebrated by publishing in reputable journals (Banks, 2006). The major limitation herein lies in the barrier that establishes itself with it: high journal prices that limit access to the haves, while denying global audiences the opportunity to access, share, improve, modify, refine and refute the scientific findings for the common good of mankind (Lawal, 2002; Pappas & Williams, 2011). This is further coupled by the challenges that African scholars face in getting published in reputable journals (Moahi 2009). It is then that Grey literature proves its prowess.

Typically, research information in a university is first produced as grey literature, and in some cases, it remains 'grey' and fugitive forever. Even when published and goes

'white', only a fraction of the entire work goes to print. The bulk in form of raw data and reports remains grey and vulnerable to be lost forever (Jain, Bentley & Olaridan, 2009; Moahi, 2009; Samzugi, 2012).

Easy access to research and development information provides innovation motivation for industry and commerce leading to wealth creation and employment and simultaneously provides quality of life advantages in healthcare, environmental and cultural aspects (Jeffery, 2000; Raju, 2013; Haddaway & Bayliss, 2015). When such information exists as grey literature, it compels a case for proper management to guarantee acquisition, description, dissemination and preservation. This is more so as it becomes increasingly clear that grey literature documents the knowledge and know-how of the organizations and cultures, and as such is an asset that is extremely valuable (Raju, 2013; Ifijeh, 2014).

Grey literature is an important research output. In today's knowledge society, grey literature is like the foundation stone. Starovoitov, Tiratev, Bogdanov, and Pavlov (2007) assert this and are convinced that if during several latest years scientific information exchange was founded on printed matter, then grey literature becomes the information basis of today's knowledge society. Grey literature unequivocally documents the knowledge and know-how of the organization. It represents the cutting edge of research (Correia & Neto 2002; Tsakonas & Papatheodorou, 2008).

Južnič (2009) further notes that universities and other institutions of higher education are by far the greatest producers of grey literature. Universities spend vast amounts of money

on scientific research and subsequent production of grey literature, yet, the majority of the papers reporting the results of research are often locked in databases which give access to paying subscribers only (such that even the authors cannot access what they wrote) and the rest lays unmanaged in the producers desktop (Moahi, 2009). In the end, as Barjak (2006) laments, access to knowledge is restricted and so is the development of science and research with a direct negative effect on the well being of humanity as vast amounts of resources are reused to repeat research.

The fundamental principle of research is that wide dissemination of research results is vital for validating results and advancing the field of knowledge (Nwangu, 2007). Anbu (n.d) and Ezema and Igbo (2016) however note that disseminating one's research findings is also a major concern in Africa mainly because of publishing and access challenges. African scholars often desire to be published in reputed periodicals which results to either delayed publication, no publication or when published, the African scholars are not able to access what has been published. This scenario produces a state of minimum visibility and impact of research works.

Grey literature defined

What really is Grey Literature and why should it be the pre-occupation of this research? The most common standpoint adopted in defining grey literature is that from the Third International Conference on Grey Literature Conference, GL 97. In the so-called Luxembourg definition, grey literature is defined as that which is produced at all levels by government, academia, business and industry, both in print and electronic formats, but

which is not controlled by commercial publishing interests, and where publishing is not the primary business activity of the organization (Luzi, 2000). Subsequent conferences gave rise to the Prague definition covered in the literature review.

Grey Literature is often defined by its characteristics, aside the formal semantics. It is generally not available through normal book selling channels, it suffers haphazard or specialized distribution arrangement, is available in small print runs, suffers variable standards of editing and production, poor publicity, bibliographic control and poor availability in libraries. It also tends to be unpublished or published with delay.

For this study, academic grey literature adopts Siegel (2004) definition as that which is produced by faculty or staff in the university, for the purpose of sharing scholarly information with others. It is also known as scholarly grey literature.

Grey Literature in Africa

African scholars produce scholarly works and are quite active in production of seminars and conferences that produce conference papers. In Otike's (1993) experience, highly researched papers appear in such events. While a few of these may later appear in proceedings, majority of them are bound to disappear with the event (Osayande & Ukpebor, 2012).

When properly managed, grey literature is paradoxically able to transcend a number of access and dissemination barriers associated with poor access and visibility. This is

because it renders itself free from constraining legal and commercial factors that surround published works. For a continent like Africa, this has implications of improved global visibility and subsequent use of research works to address challenges that befall the continent (Nwangwu 2010; Moahi 2009; Osayande & Ukpebor, 2012).

Ubiquity in technology and communications is rapidly leading to production of digital grey in African universities (Moahi 2009). But how these scholarly outputs are being managed raises concerns. Who really is responsible for managing the digital academic grey literature being produced? What is being done to organize and curate these new forms of knowledge? What options are available to African scholars for managing their scholarly digital outputs? What do faculty think and do about managing these outputs?

Digital grey literature management entails a form of scholarly communication mediated by information technology, particularly digital media and the Internet. This is more so in light of the variant common ways of its management: repositories institutional or discipline, individual web pages, research web page or the online library catalogue with links to full text. Rieger (2008) affirms that with the Web's ubiquity and its ability to make new digital authoring applications accessible, a wide range of intellectual materials ends up in some form of online publication. The various ways of managing digital grey literature also facilitate the Green Road of open access. This is because grey literature in form of preprints renders itself appropriate for depositing in the institutional and subject repositories.

1.1 Background to Strathmore University

A study of digital grey literature in an open access context necessitates a suitable institute that relates with the issues addressed in the introduction: an institution that already has a deep web presence, that already embraces ICT in its operations, has departmental websites and a well established Institutional Repository (IR). Strathmore University (SU) was therefore identified as a suitable target for a study of practices of faculty in digital grey literature management.

SU is a private institution of higher learning that was chartered in June 2007. The University's charter was gazetted under the Universities Act (Cap 210B) in Kenya Gazette supplement no. 47 (Legislative Supplement no 27).

SU's vision is to be a centre of academic and professional excellence that provides all-round education in an atmosphere of freedom and responsibility. In its mission, the university dedicates itself to the advancement of education through teaching, scholarship and service to society by providing an all-round education in an atmosphere of freedom and responsibility, creating a culture of continuous improvement, fostering high oral standards and developing a spirit of service and respect for others (SU Website, www.strathmore.edu).

In doing this, SU develops high standards of admission, tuition and examination administration. It shall also adopt the requirements of all relevant professional and examination bodies. The university is ISO 9001:2008 certified. It is committed to continuously improve the effectiveness of the Quality Management System to ensure that it fulfils its purpose.

The university has eight academic departments and a research centre, as well as an arm that provides consultancy services, serving a student population of 4,000 students. The academic departments comprise of two faculties, two institutes and four schools. The faculties comprise of the Faculty of Management & Commerce and Faculty of Information Technology. The two institutes are Institute of Tourism & Hospitality and Institute of Finance & Applied Economics. The four schools comprise of Strathmore Business School; Strathmore Law School, School of Accountancy; and School of Graduate Studies. With this growth, and the commitment to improvement through quality management system, there is little doubt that research has to play a central role. The research outputs too need a leveraged system of management so as to minimize duplications, as well as make it visible to the entire world. The library thus stands at the forefront in this task.

The library's vision is to provide information resources in support of the teaching, research and community endeavours of SU (Strathmore University, 2008). The library therefore commits itself to collect information resources and services and make them readily accessible, so as to encourage learning, research and improvement throughout life. The library strives to spread a culture of solidarity that will uphold the dignity of the human person and family values, and assist in preparing students to become competent professionals who can enrich society with their knowledge, initiative and personal responsibility.

Being at the service of the university, the library aims to support scientific research, quality teaching and community service by building up a qualitative collection of printed and non-printed materials, equipping itself with appropriate Information Communication Technologies (ICTs), and linking subscribing to library reference services.

The library consists of four departments: Information Services, Technical Services and Information Technology and Information Literacy. The information services section is in charge of circulation, special collections and periodicals, audio visual and electronic services department (Library Strategic Plan, 2008).

Understandably, most grey literature is currently handled by the Special Collections department. The department is in charge of managing thesis, some learning materials like past examination papers, sample company reports, government publications, research publications from international and local institutions, newsletters both internal and external ones and other research publications. The challenge of managing digital grey literature is therefore eventually be under the jurisdiction of this department.

World University Rankings published by the Ranking Web of Universities (www.webometrics.info) placed SU the top university in Kenya for the period 2008-2009 (Webometrics, 2010). Strathmore Business School was also ranked top in a separate ranking of business schools. The university would thus be interested in maintaining and improving its rankings globally. A factor used to rate universities according the website (Webometrics 2010) is the web presence of the institution, which indirectly signals the

amount of research being undertaken by the institution. An IR greatly contributes to this visibility (Fan, 2015).

With ubiquity of Information and Telecommunication Technologies (ICT), much knowledge in the university is usually born digital (Jain *et al*. 2009). Like most other African countries, there is no systematic leverage of these research content (Moahi 2009), hence no systematic acquisition, organization and access is done for ease of use and sharing with others. This is something that IRs and other infrastructures used to manage digital grey literature are at least capable of addressing.

Su- repository and Open Access policy

In recognition of its role, the library set out to install an IR named the SU-Portal. The installation and customization was completed successfully, and policies to run it were drafted, including an OA mandate. The repository was then marketed to potential populators and users academic staff, administrative staff and students. (Gitau, pers. comm.) Despite these efforts, growth and use of the repository is still lagging. Two years later, the repository is still struggling to build content.

Why haven't faculty rushed in to populate the repository despite the benefits portended? How are faculty currently managing their digital content? What should be done to encourage more submissions to the repository? What needs to be done to encourage involvement in digital grey literature management? This study therefore seeks to find out the grey literature produced by faculty, the subsequent dissemination practices accorded

to them, and the underlying motivation for the actions taken, with a view of suggesting techniques that would improve digital grey literature management systems.

1.2 Statement of the Problem

Despite the fact that grey literature plays a key role in academic research undertakings, it is currently not well represented in the established information landscape. Most libraries invest little effort in digital grey literature management in totality: little is done to acquire it, little done to describe and little to enhance its access and use (Farace & Schöpfel, 2010). The most common form of grey literature collected in institutions of higher learning is thesis and dissertations. Even then, the descriptions to them are often basic and access often restricted. Yet, it is this grey literature that uniquely defines a library collection.

Digital grey literature has presented a scenario that relinquishes management tasks to the creators. The creators of grey literature often lack the skills, knowledge and willpower to manage these resources, often leaving the digital works marooned in their personal computers. Jain *et al*. (2009) estimate that 80-85% of digital intellectual output of universities is never made accessible to the public. The overall effect of poor management of grey literature has been poor visibility of these collections, minimum use, and repeated works of research due to the difficulty encountered in knowing what research has been done (Banks, 2006; Barjak, 2006).

Technology has made it easy to create, store and access digital material. Developed countries use subject and IRs, authors' self-archiving web pages and links in the library catalogue to manage their digital grey literature. These offer a service to collect, organize, archive and provide access to digital grey literature. They can create a virtual and intellectual environment for the community's digital output. They are an attempt to address the challenges of digital archiving, the expectations of the campus community for better access to information, and the inadequacies of the current cumbersome model for scholarly communication. However, Barjak (2006) confirms that Africa is yet to identify with these initiatives aimed at leveraging grey literature management.

African researchers are engaged in scientific research and writing and are trying to make their findings available to their fellow Africans and the wider world as well (Nwangwu, 2010). Without managing digital grey literature using technologies that make access to African works visible, the continent risks global obsolescence. Moahi (2009) notes that in general, African universities are ranked lowest in terms of research output and scholarly research presence globally, something that proper digital grey literature management could address.

In response to best practices and the evolving scholarly communication developments, SU set out an IR in 2008 called the SU-Portal. Mandates on OA were developed and ratified by the institution. The library marketed the repository to the scholars, giving all the benefits that it envisaged would arise from the repository use. This included visibility to publishers, attracting research funds, increased citations and long term curation and

identification of the works. Faculty expressed interest during the presentations and appeared motivated. However, the repository still encountered great challenges in recruiting content. Faculty did not willingly deposit their content to the digital repository, despite the technical provision of this feature in the DSpace software used to manage the repository, and trainings and persuasions. Where was the library going wrong?

This study therefore seeks to find out the grey literature produced by faculty, the subsequent dissemination practices accorded to them, and the underlying motivation for the actions taken, with a view of understanding faculty so as to develop a framework for academic institutions to improve digital grey literature management systems.

1.3 Aim and Objectives

The aim and objectives of this study are as presented below.

1.3.1 Aim of the Study

This study seeks to examine how faculty organize and disseminate the digital grey literature they produce, and their underlying motivations with a view of providing a framework for improving its management.

1.3.2 Objectives of the Study

The objectives of this study are to:

i) Identify digital grey literature produced by faculty at SU.

ii) Assess organization practices accorded to the digital grey literature by faculty at SU.

iii) Assess dissemination practices accorded to the digital grey literature by faculty at SU.

iv) Understand motivations for choice of organization and dissemination practices for the grey literature produced by faculty at SU.

v) Suggest a framework for improving digital grey literature management.

1.4 Research Questions

i) What forms of digital academic grey literature do faculty produce?

ii) How do faculty organize the grey literature they produce?

iii) How do faculty disseminate the digital grey literature they produce?

iv) What factors influence faculty's decision to disseminate digital grey literature?

v) What measures can be put in place to facilitate better management of digital grey literature?

1.5 Assumptions of the Study

The study presumes that :

i) With ubiquity of computers and information communication technology tools at the university, a great proportion of grey literature produced is born digital.

ii) IRs, subject repositories, departmental web sites, author self archiving web pages and catalogue entries in the library improve organization dissemination, access and use of digital grey literature.

1.6 Significance of the Study

Digital technologies are gaining ubiquity in universities, and their use for creation of scholarly content is increasing. Scholarly works are being produced that can be typically considered as grey literature. This research will contribute to information and knowledge on management practice and is anticipated to be of value to the institution, librarians, faculty and the researcher.

Currently, no study known to the researcher has been done to find out the various methods that are used to manage digital grey literature in Kenyan universities. This study will therefore shed some light on the status quo, and contribute to the knowledge pool. It also extends the use of three theoretical approaches (Actor Network Theory (ANT) and Social Exchange Theory (SET) and Social Capital (SC)) in the management of digital grey literature.

SU and a number of universities in Kenya are also in their initial stages of setting up IRs. Evidence from developed successful implementations of digital grey literature management systems (Foster & Gibbons, 2005; Kankanhalli, Tan & Wei, 2005; Kennan & Cole, 2008; Kim, 2011; Crow, 2002; Wu, 2015) suggest recruitment of content as central for successful digital grey literature management systems. In studying digital grey literature management practices and perspectives of faculty, the study will help librarians formulate proper strategies for populating the repositories.

For SU, the research aims to provide a policy framework that can guide best practice for management of digital grey literature for greater visibility. This will hopefully help improve the institution's global ranking in Webometrics.

1.7 Scope and Delimitations of the Study

The study will employ case study methodology in its research design. The study examines digital grey literature management practices at SU. Case study designs do not necessarily aim at generalization of findings, but rather for in-depth understanding. As such findings may not hold true for grey literature management in all universities in Kenya. Furthermore, the study employs a single-case, further limiting its generalizability.

The study will also only focus on digital grey literature management. Print grey literature will not be considered. Even then, not all digital grey literature will be considered, but only that of academic nature that is born digital: pre-prints, electronic theses and dissertations, models, research data, working papers and reports, cases, unpublished conference papers, inaugural lectures, computer software and such related scholarly outputs.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews current theory and practice of managing digital academic grey literature. It helps relate the current study to the larger dialogue in the literature about it. Literature is primarily gathered through journal articles with a combination of grey literature sources such as conference papers and dissertations.

First, the researcher presents related theories that have been presented in literature to explain motivation for grey literature management. These are reviewed for consideration for use in the study and the selected theories (Actor Network Theory (ANT) and Social Exchange Theory (SET) are used to come up with a list of factors that would affect grey literature management. Based on the triangulated theories, a theoretical framework that guides the study is presented.

A thematic review of literature then follows. The purpose of this review is to present major themes that relate to management of digital grey literature in the OA context. It enables an understanding and appreciation of the subject under study as well as the major researches undertaken in this area. To begin with, the general concepts of ‘grey literature’ what informs the scope and ‘digital grey literature is explored, and working definitions for these terms are provided. The section continues by presenting the role of digital grey literature and the challenges traditionally associated with managing these forms by both librarians and their creators. Systems currently employed in managing digital grey

literature namely subject repositories, IRs, research web pages, individual web pages and links in the library catalogue are then explored. Finally, studies discussing factors related to adoption of these systems are reviewed from a socio-technical perspective.

Finally, the various factors identified that may affect faculty's management of digital grey literature are summarized as earlier presented in the conceptual framework.

2.1 Theoretical Framework

Digital grey literature management entails a form of scholarly communication mediated by information technology, particularly digital media and the Internet. This is more so in light of the variant common ways of its management: repositories – institutional or discipline, individual web pages, research web page or the online library catalogue with links to full text.

According to Luzi (2000), Grey literature production has always been associated with the need, especially of researchers in scientific circles, to find fast and informal channels to promulgate their ideas. Therefore, studies in this light often encompass models of communication, while others relate it more closely with knowledge management theories.

Below is an overview of theories that the study reviewed and adopted for this study.

2.1.1 Technology Acceptance Model

In investigating digital grey literature practices particularly in view of its various ways of dissemination through repositories and other digital technologies, the first choice of theoretical bases would appear to be the Technology Adoption Model (TAM) which has been successful in explaining the usage of information systems. TAM was initiative by Davis (1986) and is preoccupied by how individuals perceive the technology, and how they eventually use it. It maps out Perceived ease of Use, Perceived Usefulness and Perceived enjoyment in use of the technology as prerequisites to attitude formation and eventual use of a technology.

TAM has been successfully used in mapping out adoption of new technologies such as blogs, e-learning, e-commerce, world wide web, enterprise systems and social media adoption. The three constructs perceived ease of use, usefulness and enjoyment in using the technology have been frequently expanded and modified to fit the emergent issues under study (Amoako-Gyampah & Salam, 2004; Cheung & Vogel, 2012; Hsu & Lin, 2008).

For this study, however, TAM does not take to account prior experience and other characteristics that influence attitudes. The current study is not just on technology adoption, but is geared to a wholesome understanding of faculty behaviour in relation to grey literature sharing. As such the theory does not directly account for the social cost and benefit factors experienced by faculty in contributing their knowledge, and that may affect their collective technologies (Kim, 2011; Kim & Crowston, 2011).

Rieger (2008) comments on theoretical models for studying IR adoptions and positions herself with the view that adoption and adaption of Information and Communication Technologies is often tightly coupled within the context of a specific implementation, and hence IRs should not be examined from a predominantly technical perspective. The functionalities and affordances introduced by the various technologies for managing digital grey literature need to be positioned by taking to consideration the social and cultural factors that have shaped scholarly conduct for several centuries. She posits that technology deployment cannot be understood without comprehending how a specific technology is embedded in its social context.

It is therefore deemed appropriate to encompass theories related to digital scholarly communication and knowledge sharing. As Kennan (2008) observes, scholarly research is a social process, and research is incomplete until it is shared with others. To be shared the scholarly research must be communicated, used, disseminated and developed within a community. Three theories were therefore found appropriate for this study: Actor Network Theory (ANT) and the Social Exchange Theory (SET) and Social Capital Theory (SC). Other theories reviewed included Socio-Technical Network Theory (STIN) and Technology Adoption Model. (TAM) (Dutton, 2013; Kling, McKim, & King, 2003; Pinfield *et al*., 2014; Rieger, 2008).

In this context, theories will be adopted as formal conceptualization or a set of presets that helps make sense of a phenomenon. (Creswell 2009; Bell, 2010). In light with the

paradigm adopted for study, the researcher will use the theories as a viewing lens, as a scaffold.

2.1.2 The Actor-Network Theory (ANT)

Actor-Network Theory (ANT) belongs to the umbrella of Social Shaping Theories. These theories emerged from Science and Technology studies as a response to the then prevailing view: technological determinism characterized by the belief that technologies change either because of scientific advancement or following logic of their own *and then* they have an effect on society (Bell, 2010).

ANT was developed by Callon, Latour and Law (Kennan, 2008). ANT was developed to counter two extreme views: technological determinism and social determinism with the first viewing technological adoptions to change society, and the latter viewing social structures determining technological adoptions. ANT is a middle ground that maps human and nonhuman actors in the same framework, and assigns them equal amount of agency. Therefore it treats all actors as same, in a principe referred as generalized symmetry. By treating the same with similar agency, it becomes possible to get a detailed view of the mechanisms at work, what holds the network together, while being partial (Underwood, 2008; Tatnam & Gilding, 2005).

Fox as cited by Bell (2010) identifies three key aspects of ANT: symmetrical analysis whereby material and non-human elements are treated the same as social and human elements; ANT analyses are intended to illuminate how a network grows and decays

rather than explain outcomes; and third that the process of growth/decay is one of translation. ANT is descriptive, telling us stories of how things do or do not assemble, a sociology of translation, emphasizing the work of human and non-human actors in building a network, as they form alliances (Bell, 2010). As such, it is not viewed as a theory, but a flexible viewing lens (Mol, 2010). Networks are flexible, being freely affection by associations. The networks are also unstable and are influenced by entrance and exit of new actants. Fundamentally therefore, it shares approaches from the qualititative approaches of study (Hasneth, Aanestand & Berg, 2004; Tatnam & Gilding, 2005).

In this study, ANT is perceived as very favourable given that grey literature embodies a component of scholarly communication processes. The original model by Latour was modelled through parallel observation. Digital grey literature involves among others interactions of multiple complex actors such as researchers, publishers, libraries, editorial boards and research artefacts, subject repositories, IRs and OA (Rieger, 2008). The ANT framework illustrated by Rieger (2008) is modified to be able to observe digital grey literature within the larger framework of actants.

This study has adopted ANT as a viewing lens. ANT is often viewed as an attitude to understand the social contexts particularly in information sharing. The theory has influenced the selection of actors that come to play and can affect digital grey literature management. It is not enough to just view how faculty manage digital grey literature by divorcing digital grey literature from the context of its production and other parties in

play. The diagram below, modified from Rieger (2008) summarizes the main actors and actants in play in scholarly publishing, which can adequately be extended to digital grey literature management.

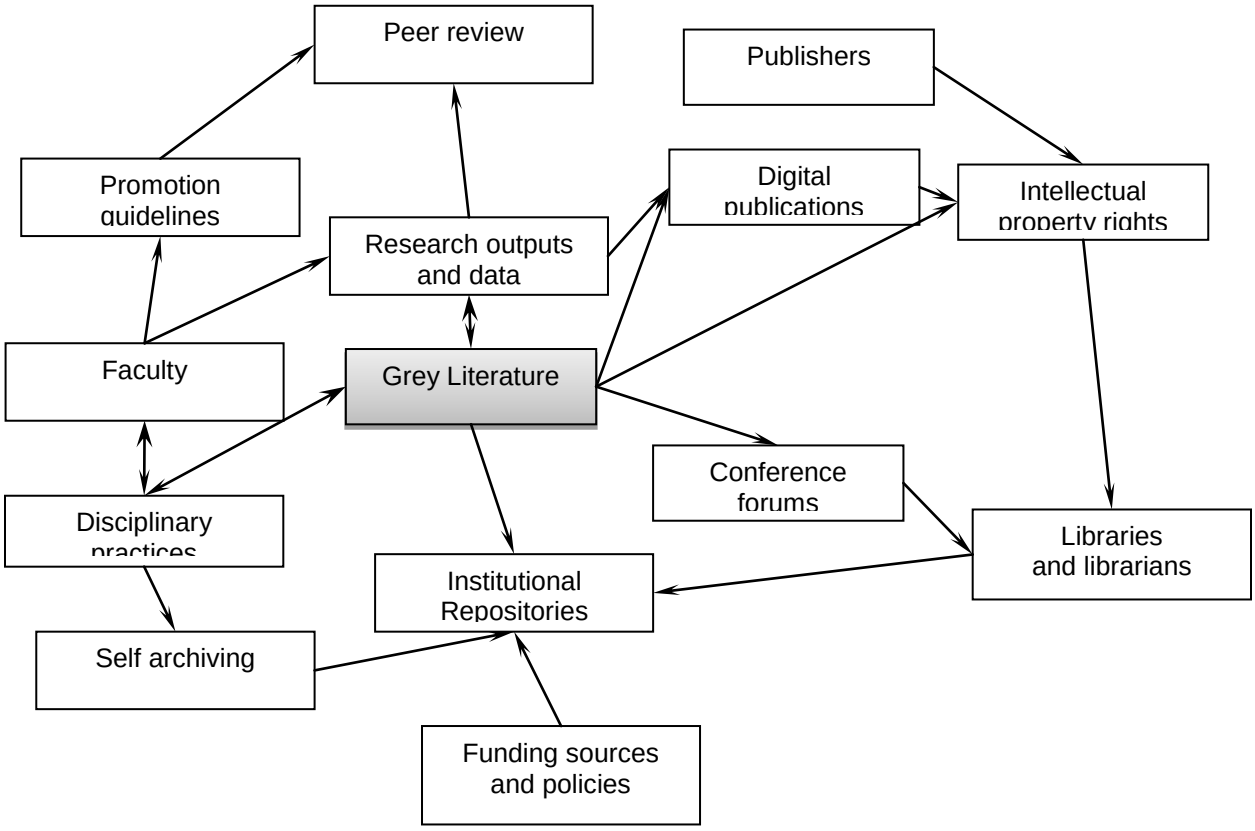

Figure 2.1: Actor-Network Web of Grey Literature Management.

Adapted from Rieger, O., 2008. *Opening up institutional repositories: social construction of innovation in scholarly communication.*

Based on the illustration, it is clear that technical issues are meshed with organizational issues. The power-play is therefore evident in the relations with both internal and external factors that affect policies, regulations, organization and structures. The system therefore works on the balance (Hasneth *et al*., 2004; Govender & Chitanana, 2016; Mitev, 2000). The success of the system is based on the balance of the actors. Technologies adapted in

managing digital grey literature and their subsequent adoption are therefore pegged in a larger context that is determined by complex actors.

For us to understand how and why digital grey literature is being organized and disseminated by the creators, it is crucial to look at all the actants in the network: librarians, technology and the knowledge producers. Informed by ANT, the current study focuses mainly on the human 'actants' in the network. It informs the researcher that social actors cannot simply press their wills on inert passive "things" and similarly artefacts cannot force human actors to perform in a specific way. Instead here is "symmetry" between the social and the material as they are inseparable. Actors may thus be human, organizational, technological, other non human or political (Kennan, 2008). The theory is critical in putting the research objectives: understanding how and why faculty organize and disseminate the digital grey literature that they produce.

ANT has been proposed and used successfully used to understand scholarly communication processes (Walsham, 1997). It has been used by Kennan (2008) to study scholarly publishing in the advent of IRs and OA as not just a theory but a viewing lens for the entire study. ANT has also been used to understand communities of practice and how they share information (Fox, 2000); understand information technology implementations in complex healthcare systems (Cresswell, Worth and Sheikh, 2010). Additionally ANT has been used in understanding e-government implementations in developing countries (Stanforth, 2006).

The objective of this study is to understand how and why faculty share the grey literature they produce. This embodies a form of scholarly communication and ANT is seen as a useful viewing lens to put all actants into play. It enables a holistic view that encompasses the needs and requirements of other players and how they affect interrelationships.

As a theory, ANT has been critiqued of relying on a naturalizing ontology and an un-reflexive epistemology (Whittle & Spicer, 2008). This however does not deter its use given that the researcher is already using the qualitative interpretive paradigm which blends in well with this.

2.1.3 Social Exchange Theory

Social Exchange Theory (SET) was initiated by Homans (1958). In his own words he provides the following summary of the theory: "Social behaviour is an exchange of goods, material goods but also non-material ones, such as the symbols of approval or prestige. Persons that give much to others try to get much from them, and persons that get much from others are under pressure to give much to them. This process of influence tends to work out at equilibrium to a balance in the exchanges. For a person in an exchange, what he gives may be a cost to him, just as what he gets may be a reward, and his behaviour changes less as the difference of the two, profit, tends to a maximum." (Homans 1958, p.606). SET therefore argues that individuals evaluate alternative courses of action so that they get best value at lowest cost from any transaction completed (Hall, 2003).

Social exchange is construed to have three core components : Actors, resources and processes (Molm, 2003). Actors can be persons, groups or structures. Resources are the possessions or behavioural capabilities. Therefore, they can be tangible or intangible. In the exchange, actors try to obtain valuable resource through a process. Individuals try to engange in this exchange while maximizing benefits and minimizing losses. In conducting an exchanges, a relationship between actors may develop, for subsequent exchanges, trust may be generated in the transaction itself (Kankanhalli *et al*., 2005).

Additional components of the Social exchange include costs, which is the efforts required to articulate knowledge, or the loss of personal value associated (Molm, 2003). Behaviour therefore becomes a derivative of payoffs which could be provided by human or non-human environment (Cook, Cheshire, Rice, & Nakagawa, 2013).

Taking an economic view social exchange is framed in terms of rewards and costs. Actors partake actions that demonstrate a quick calculation of anticipated costs and benefits, and eventually choose one that maximizes benefits and minimizes cost (Cook, Chesire and Rice, 2013). Unlike the economic exchange, where the value of the exchange in known before hand, social exchange involves voluntary actions that are performed in expectation of a reward a future return (Cook *et al*., 2013). Therefore, SET assumes the existence of relatively long-term relationships of interest as opposed to one-off exchanges where more than two people participate and reciprocal dependence is indirect. In this context, digital grey literature producers may share their knowledge with no exact

expectation of future return. The quantity and value of knowledge contributed is difficult to specify and so is the return obtained.

There are four key elements in social exchange theories: (1) actors, (2) resources, (3) structure of exchange, and (4) process of exchange. Actors can be individuals or groups, who behave based on rational decisions to increase positively valued outcomes and decrease negatively valued ones. Resources are defined as the currency of exchange, which would be tangible or intangible. Resources received as a result of the exchange are defined as outcomes. Benefits are positive outcomes resulting from the exchange, whereas costs are negative outcomes in the course of the exchange, or resources given away during the exchange (Kim, 2010; Kim, 2011; Hall, 2003). The basic proposition of SET is that people behave in ways that maximize their benefits and minimize their costs.

The structure of exchange denotes dependent relationships supporting the exchange. Types of the exchange structures identified include direct and generalized exchange. A direct exchange refers to case in which actor A directly provides value to actor B. In the generalized exchange, actor A and B do not reciprocate directly. Instead, actor B provides value to actor C, who offers value to actor A. Then, actor A provides value to B, although B does not directly return the value to A (Molm, 2003; Kim, 2010). This is a useful reflection in view of managing digital grey literature by librarians since they are often involved in transactions that are generalized.

Reciprocal benefits refer to expected return from knowledge contribution. Reciprocal relationships develop over time, as opposed to a single-time event (Molm 2003; Kim 2011). The mutual interchange of knowledge between authors and readers is hardly expected in self archiving (and by extension to grey literature management). In fact, it often involves free and unlimited access to research materials, and this OA characteristic of self-archiving implies a degree of altruism in sharing information. (Kim, 2011)

SET emphasizes that people are actors who rationally choose their lines of actions. It is therefore found to be congruent with ANT and appropriate to this study. SET deals with individual actors in a society, asking why they choose a particular set of actions. SET enables the different actants mapped in ANT to be used to establish the cost and benefit factors that come to play in dealing with digital grey literature.

SET has been used in different studies related to information sciences by a number of authors (Jarvenpaa & Staples, 2000; Kim 2010; Kankanhalli *et al*., 2005; Hall, 2001). Different costs and benefit factors have been established in different contexts related to information sharing (and therefore dissemination). As such it has been found suitable for use in information sciences.

From review of related literature mostly dealing with knowledge sharing behaviour, Wasko & Faraj, 2005; Kankanhalli, *et al*. 2005; Ford & Chan 2003; Chiu *et al*. 2006; Bock *et al*. 2005; Kim 2011 a number of factors emerged that would affect knowledge

sharing. These are summarized as costs, intrinsic benefits, extrinsic benefits, contextual factors and individual traits and are discussed further in the literature review.

The objective of this study is to find out how and why faculty share the grey literature they produce. SET is seen as a useful model to derive cost and benefit factors that could influence faculty in their decisions to share or not share their grey literature. SET has been used to provide the underlying conceptual framework. A model drawn from SET by Kim (2008) is modified to provide factors that could influence management of digital grey literature by faculty.

While SET provides a useful model, it has been critiqued to overly rely on the individual factor, and does not take to account contextual factors that could come to play. (Health, 1976). To counter this, the researcher used the SC theory.

2.1.4 Social Capital (SC)

SC embodies resources embedded in a social structure that are accessed and /or mobilized for purposive action. The difference between SC and other forms of capital is that it is embedded in the social realm. SC resides in the fabric of relationships between individuals connections with their communities.

Nahapiet and Ghosal (1998) present SC as an integrative framework of understanding the creation and sharing of knowledge in organizations. They argue that organizations have unique advantages for creating knowledge over open settings such as markets because

organizations provide an institutional environment conducive for the development of SC. They suggest that the combination and exchange of knowledge is facilitated when: an individual is motivated to engage in its exchange; there are structural links (connections) between individuals (structural capital); Individuals have the cognitive capability to understand and apply the knowledge (cognitive capital and; their relationships have strong positive characteristics (relational capital).

Trust is the belief that the intended action of others would be appropriate from our point of view. It is the willingness to be vulnerable to others due to beliefs of their good intent and concern, competence, capability and reliability.

Generalized trust is an important form of trust that does not rest with specific individual but rests on the behavior that is generalized to a social unit as a whole. Generalized trust has been viewed as a key factor that provides a context for co-operation and effective knowledge exchange.

In the view of Wasko and Faraj (2005), trust is a complex phenomenon. Trust develops when a history of a favorable past interactions leads to expectations about a positive future interaction. Trust in online setting suggests trust in others ability, benevolence and integrity is related to the desire to give and receive information.

Kim(2010) cites Ghosal as enlisting four prerequisites for trust: good intention and concern for the exchange partners, their competence and capability, their reliability and

their perceived openness. Specifically for IRs, faculty contributors need to have trust in their institutions and the integrity wisdom and competence of people who manage and preserve works submitted to IRs. Chan (2004) says that if faculty lose trust in the library's long term commitment to IRs, they would be less likely to contribute.

SC resides in relationships, and relationships are created through exchange (Bourdieu, 1985). The pattern of linkages and the relationships built through them are the foundation for SC. Therefore, SC can be created and sustained through exchange and in which, in turn, SC facilitates exchange. For example, where parties trust each other, they are more willing to engage in cooperative activity through which further trust may be generated. In social systems, exchange is the precursor to resource combination. Thus, SC influences combination indirectly through exchange (Nahapiet and Ghoshal, 1998).

In social systems, exchange is the precursor to resource combination. Thus, SC influences combination indirectly through exchange (Nahapiet and Ghoshal,1998). The limits of SC is that it has many different attributes and it has been argued that a high research priority is to clarify the dimensions of SC. In this study, the trust and culture are the attributes used.

SC has been variously used to study information sharing. The chief limitation of SC is that it is perceived to limit individual actions, by making individuals conform to expected norms. This is countered by provisions of the SET. The two therefore provide a productive counterbalance of the system.

2.1.5 Triangulation of the Theories

Three theories have been used in this study ANT, SET and SC.

ANT has been used as a theoretical viewing lens to be able to ‘see’ all the actants that come to play in the field of grey literature. It enables the researcher to appreciate that Grey Literature does not exist in a vacuum, but rather in a context where it is influenced by other human and non-human actors of equal agency. This is perceived as critical in laying the base understanding and providing a panoramic view.

The SET and SC Theory has been used to establish the costs, benefits and contextual factors that could come to play and influence the perception of the faculty. Based on findings from literature on the cost factors, the benefit factors and SC factors, the theories have been used to provide initial themes that would be used for probing qualitatively, as well as potentially discover new factors that could be identified.

Consequently, the SC and SET are blended to produce the theoretical framework that is presented in Figure 2.1. The individual factors identified are further discussed in the literature review section in this chapter.

CONCEPTUAL FRAMEWORK

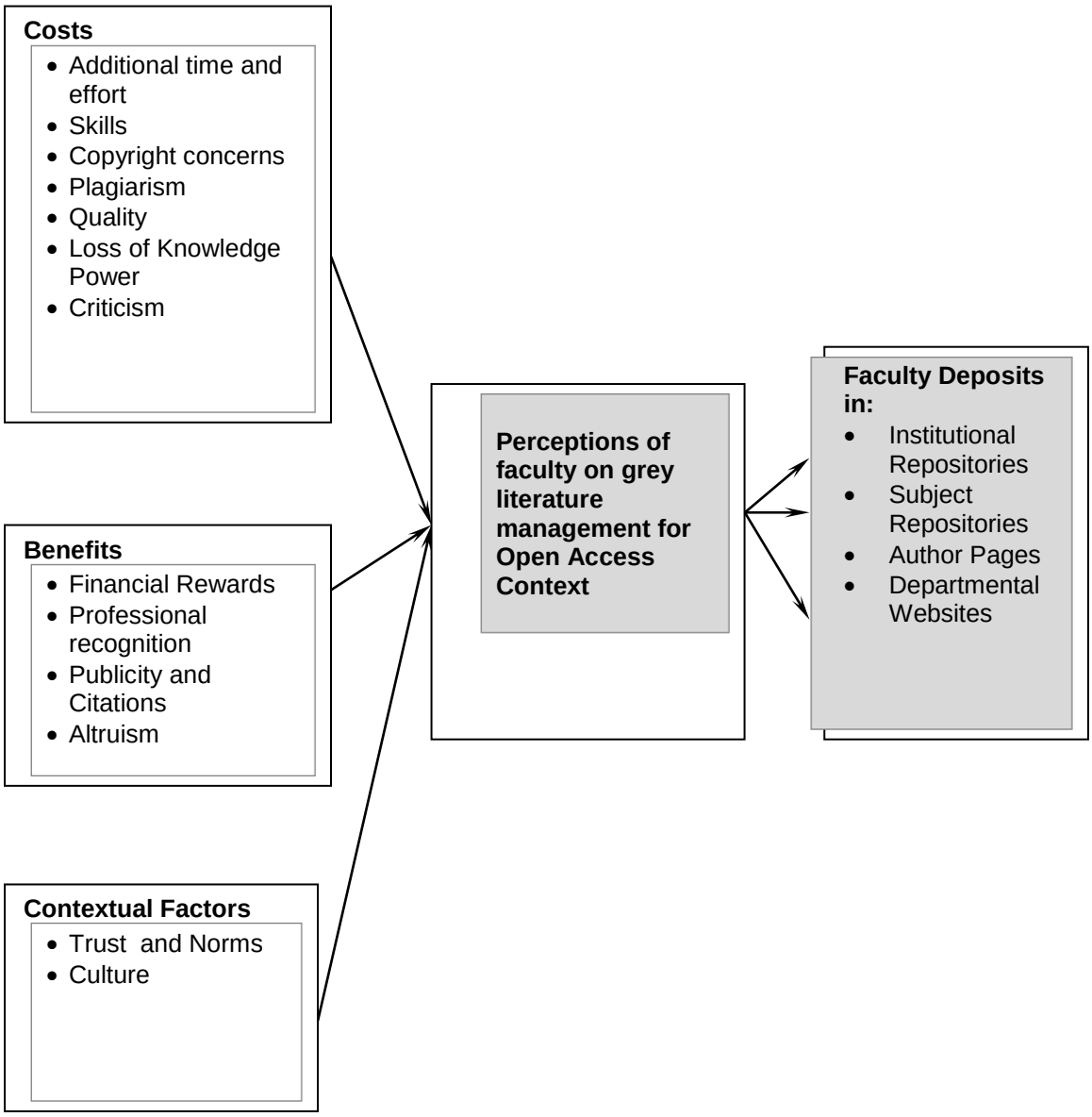

Figure 2.2: Conceptual Framework of Factors affecting Digital Grey Literature Management

2.1.6 Grey Literature: History and Definitions

Luzi (2000) gives a synopsis of grey literature development from the turn of the century. It is generally contented that grey literature history dates back to turn of the 20th century when the first set of reports from the aeronautics industry were produced in 1915, and their subsequent use in the war period as a means of transferring information amongst insiders. And right from the outset, as she contends, the historical and scientific contexts of its production determined the peculiar characteristics of grey literature and differentiated it from the conventional literature in terms of production and methods of diffusion. This peculiarity of grey literature is acknowledged and asserted by a number of authors (Luzi, 2000; Muswazi, 2001; Gelfand, 1999).

The most common standpoint adopted in defining grey literature is that from the Third International Conference on Grey Literature Conference, GL 97. In the so-called Luxembourg definition, grey literature is defined as that which is produced at all levels by government, academia, business and industry, both in print and electronic formats, but which is not controlled by commercial publishing interests, and where publishing is not the primary business activity of the organization (Luzi, 2000).

According to Schöpfel (2006) this definition in itself contains two of the main characteristics of "grey" resources: on the one hand they are universal and ubiquitous, but on the other hand, they are difficult to identify and to obtain through conventional publishing circuits. However, leaving the definition as it is opens a Pandora box for inclusion of all sorts of documents from product manuals, newsletters, catalogues and

other publications that would otherwise be termed as ephemeral. It is for this reason that a number of scholars prefer to rather describe grey literature from its characteristics, a view preferred by multiple scholars (Schöpfel & Stock, 2009; Mackenzie Owen, 1999; (Kwafo-Akoto & Moahi, 1994; Luzi, 2000, Joachim & Schopfel, 2006; Otike, 1993; Nahotko, 2008). In the evolving definition, grey literature has further expanded to include possibly blog posts, tweets, research data and an entire uncontrolled enlisting of resources (Schöpfel, 2015).

Schöpfel (2010) proposed what later became adopted as the "Prague definition." He explained that grey literature stands for manifold document types produced at all levels of government, academic institutions, business and industry in print and electronic formats that are protected by intellectual property rights, of sufficient quality to be collected and preserved by library holdings or IRs, but not controlled by commercial publishers, that is, where publishing is not the primary activity of the producing body (Kwanya, Stilwell, & Underwood, 2014).

Grey literature is generally not available through normal book selling channel, and as such is difficult to identify (Otike, 1993). It often suffers from haphazard or specialized distribution arrangement, is available in small print runs, suffers variable standards of editing and production, poor publicity, poor bibliographic control and poor availability in libraries. They also tend to be unpublished or published with delay (Kwanya *et al*., 2014).

The definitional issue of Grey Literature can be called off as a multidimensional one (Gokhale, 1997). the complexity of grey literature variety is generated by diversified and interactive factors in terms of form of presentation, target audience, subjects or disciplines, knowledge about availability, accessibility and management.

Grey literature types are varied and generally accepted forms include reports, dissertations, translations, conference proceedings (Gokhale, 1997), but also working papers, government documents, bulletins, fact sheets (Pappas & Williams, 2011). Digital grey literature is thought of composing Electronic Thesis and Dissertations (ETDs), unpublished conference papers, open lectures, research data sets, working papers, reports, and pre-prints (Boukacem-Zeghmouri & Schöpfel 2005). Jeffery (2000) aligns the various grey literature to the research process and comes up with a list composing of technical papers, patents, prototypes, data and its presentation and visualization, procedure instructions, documentation and courses as additional forms of grey literature. Noteworthy is the fact that the bulk of outputs from a research process are grey literature, leaving merely journal articles, published conference proceedings and the fully engineered product to the non-grey outputs of the research process.

Given the diversity of publications and end users an attempt to define Grey Literature precisely is not a straight forward task. But, as Wessels (1997) warns, it need not be used as an umbrella term to cover everything that is non-conventional. (Gokhale, 1997) and Sen (2008) propose that the term be used to refer to that literature generated by institutions for a meaningful purpose, but which is transitory in nature. It is specific to

the location and to the situation, but the information could be of value outside the context it was produced.

For this study, academic grey literature partakes Siegel's (2004) definition: as that which is produced by faculty or staff in the university, for the purpose of sharing scholarly information with others. It is also known as scholarly grey literature.

2.1.7 Role of Grey Literature

The term 'grey literature' has for a while been associated with undertones of bleakness, apathy, indifference, dismal and dullness (Mason, 2010; Pappas & Williams, 2011). However, as the same authors contend, this if often far from the truth. The grey in grey literature could as well have the nuance of the brain's *grey* matter: intellectual and significant for research and development.

The importance of Grey Literature is becoming increasingly recognized. For many organizations, it encapsulates the knowledge and knowhow and is thus a vital business asset. It has similar importance in quality of life aspects healthcare, environment and culture. In the words of Schopfel (2006) grey literature in a research and development environment represents the cutting edge of this knowledge and so its management is of utmost importance. Gokhale (1997) indeed considers the final output of most grey literature to be the sum total of previous knowledge, acquired knowledge and intuition. Intuition is stimulated by discussions, personal talks, invisible colleges and unpublished laboratory results.

Grey literature has a role of its own as a means of distributing scientific and technical information and professionals insist on its importance for two main reasons: research results are often more detailed in reports, doctoral theses and conference proceedings than in journals, and they are distributed in these forms up to twelve or even eighteen months before being published elsewhere (Boukacem-Zeghmouri & Schöpfel 2005). As such grey information forms a major part of scientific and technical communication (Kargbo, 2005).

Another distinct role that accentuates the role of grey literature is the fact that grey documents sometimes do not have published counterparts. There are times when these results are not published elsewhere. As such grey literature often contains unique but plausible knowledge, with the issuing organizations offering a guarantee for quality. Wessels (1997) gives examples of reports and working papers from international organizations.

Grey literature has also been applied for scientific research and teaching. Free from copyright limitations that often hinder availability of 'white' publications, grey literature has found applications in distance learning (Kargbo 2005, Gelfand, 1999) and has been usefully used for scientific research and teaching (Boukacem-Zeghmouri & Schöpfel 2005).

Grey literature serves as a primary source of information for further research. As primary sources grey literature provides un-interpreted, firsthand accounts or evidence of an event

or experience. These sources contain information or data and are usually written at the time of the event or research and often present a topic in greater detail, allowing the user gain more insight and a holistic perspective of issues under consideration (Ezeani 2005). They are usually the original source of information and allow the researcher to analyze a topic without another person's interpretation (Sen, 2008).

Starovoitov *et al*. (2007) sum up the role of grey literature in this age :If during several latest hundred years scientific information exchange was founded on printed matter then grey literature becomes the information basis of today's knowledge society.

Grey literature is sought after because it fills the reader's knowledge gap by presenting the topic in greater detail and allowing the reader gain more insight and a larger perspective of the topic more than journals and books.

2.1.8 Digital Grey Literature: Forms, Organization and Dissemination

As noted earlier in definitions of grey literature (Mackenzie Owen 1997) scholars tend not to focus on distinguishing grey literature by format. As such digital grey literature is hardly isolated from the print version. It is rather an electronic manifestation of the print grey literature. With the digital revolution however, digital grey literature has wings and is capable of flying to hitherto unfathomed heights.

Digital grey literature is capable of transcending the traditional limitations that are typically associated with print grey literature. As Kranich & Schement (2010) observe,

digital technologies offer unprecedented possibilities for human inventiveness, global communication, innovation, and access to information. These same technologies also provide new opportunities to control or enclose intellectual products, thereby threatening to erode political discourse, scientific inquiry, access to intellectual products free speech, and the creativity needed for a healthy democracy, p.547. The second scenario is already being observed with publishers creating monopolies and highly pricing online resources with restrictive terms for access and use. In this scenario, grey literature not only comes in as a counter-measure, but also paves way for new scholarly communication patterns. Di Cesare & Lazzari (2000) support this view and strongly opine that the development of information technologies in the information and documentation field and the concomitant effects on working processes and products allow, albeit potentially, the effective distribution of the information sources and therefore pave the way for a change from the conception of documentary resources mainly based on ‘possession’ to a conception based on ‘access’ .

Digital grey literature is not simply a digital copy of the print version. Technological developments have enabled creation and sharing of new forms of intellectual resources. These media enable researchers to capture and share non-customary information, describe phenomena and share datasets in amongst other formats images, photographs, 3D images, spatial imagery, sound, digital computer codes for software and cinema clips (Gelfand, 1998; Osayande & Ukpebor, 2012). These could be provided with opportunities for manipulation under different conditions. Until then, such material could only be included in ‘special collections’ to be part of library holdings.

Digital grey literature management systems have been envisaged for a while and are now a reality. Drawing requirements for such a system, Jeffery (2000) enlisted that the system should be able to solicit and accept documents produced in a variety of formats including hyperlinked multimedia, be able to convert them to a canonical form for storage, be able to register them and catalogue them in a suitable way, provide legal protection by administering suitable intellectual property regulation, make provision for charging end-user services, collect statistics, provide a system for information retrieval. This essentially describes the working of open repositories.

In today's electronic information environment, the internet has become a major source of dissemination and retrieval of grey literature and often serves as a user's initial introduction to a topic area. Well designed web sites give users access to a body of digitally produced grey literature that complements the existing body of print materials (Pappas & Williams, 2011). In this context, publication is no longer synonymous to printing but rather may mean presentation on an open Internet site. New digital environment in document preparation, demand and supply shifts accents but presents new challenges to grey literature libraries and information centres (Starovoitov *et al.*, 2007).

Digital grey literature is creating an increased importance to grey literature sources. Starovoitov *et al.* (2007) attributes this to the fact that computer networks are enabling creation of new virtual environments, capable of advanced application software enabling integration of text with complicated mathematical or chemical formulae and illustrative

material. This in turn favours the widespread of digitally-born documents capable of being self-archived by authors.

The problem of transition from paper to digital grey literature is versatile and multi-faced. Starovoitov *et al.* (2007) envisage financial, legal, technological and administrative challenges. They are however certain that no matter how many obstacles are on the way, digital grey literature have become an integral part of the knowledge society information basis and are here to stay.

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Schöpfel (2006) and Južnič (2009) therefore sum up how digital grey literature is shaping the new scholarly communications: The borderline between 'grey' and 'white' literature is increasingly becoming indistinct, particularly in an environment that is moving towards OA; the proportion of 'grey' documents published on the web is increasing rapidly and the internet is encouraging availability of a greater diversity of 'grey' resources. In the far future, Banks (2006) feels that grey literature will become indistinguishable from non-grey literature.

2.1.9 Digital Grey Literature in an Open Access Context

Digital grey literature management entails a form of scholarly communication mediated by information technology, particularly digital media and the Internet. This is more so in light of the variant common ways of its management: repositories institutional or discipline (Banks 2006) individual web pages, research web page or the online library catalogue with links to full text.

Management of digital grey literature encompasses its accessibility and dissemination when de-materialization of the document has occurred, and this in turn leads to a new paradigm that supersedes the intrinsic characteristic of the printed material (Boukacem-Zeghmouri & Schöpfel, 2005). This transformation has led to association of digital grey literature systems to the OA movement.

It is difficult to complete a discussion of systems of accessing digital grey literature without mentioning the OA movement. The various methods of managing digital grey literature are intertwined with the OA movement that is partly an emergence of the call for information commons. Kranich & Schement (2008) in their discourse on information commons put forth a view of information as a public good: available to all with a common goal of equal access to information. Such is the yearning of all OA movements: to alleviate all barriers of access to information. Manifestations of OA systems are incidentally the same tools frequently used to manage digital grey literature: disciplinary and IRs. Du (2010) sees OA systems as capable of eventually leading to a solution that could alleviate financial burden on academic libraries while supporting substantial support for learning and scholarship with minimum or no institutional cost.

Digital grey literature management systems therefore attempt to solve the contemporary problem faced by many universities that of management of their digital intellectual outputs which paradoxically remain marooned from the public despite technological advancements that make creation, storage and dissemination of digital material easy (Jain *et. al.*, 2009).

a) Institutional Repositories (IRs)

The Institutional Repository (IR) systems were introduced in the early 2000s as an extension of the library's stewardship role in a new digital environment to manage a rapidly expanding digital content. IRs are also viewed as prerequisites for the OA scholarly communication model. (Rieger, 2008).

Regardless of the basis, the often cited definition of an IR is that of Lynch (2003, p.328) as: "a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members." It is essentially a database of scholarly material with content institutionally defined (Banks, 2006). Above all, it signals an institutional commitment of the organization for access and long term preservation of content by shifting the onus of managing digital materials from individual faculty to their institutions. Most IRs tend to be OA and offer minimal barriers of access to the end users (Jain *et al*., 2009).

From an information management perspective, repositories are important because they allow systematic control of digital scholarly outputs of an institution. Kennan (2008) describes repositories as an infrastructure designed to represent, classify, archive and enable search of scholarly works, and thereby support end users in providing access to research through the internet.

According to Banks (2006), the concept of IRs became prominent in 2002 as a result of the D-Space initiative between Hewlett Packard and Massachusetts Institute of

Technology (MIT). D-Space is open-source software for implementing IRs that currently supports the highest numbers of installed digital repositories with over 1,000 instances as of April 2016 (www.dspace.org). Other common software used to create repositories include E-prints, Greenstone and Fedora (Crow, 2002; Kennan, 2008).

IRs present an exciting possibility for management and preservation of digital grey literature (Banks, 2006). In this regard, they have found remarkable uses in organization and provision for access to the diverse array of digital grey literature such as reports, pre-prints, theses and dissertations, (Boukacem-Zeghmouri & Schöpfel 2005) models, visual images, datasets, course materials, and audio and video resources (Lambert, Mathews & Jones, 2006).

The selling point for IR as a management tool for digital grey literature is vested on the benefits that it purports to offer to all actors involved: institutions, librarians, authors, and society as a whole (Lambert *et al*., 2006). To the librarian, the repository offers a way of systematically managing digital intellectual resources by providing a system for metadata entry and attachment of the full text. This in turn provides easy access and retrieval to the end users. Noteworthy, IRs also allow librarians to proactively respond to the escalating crisis in scholarly communication that has seen journal prices skyrocket by aligning repositories to OA systems (Crow (2002) says that in establishing an IR the library seeks to move beyond a custodial role to contribute actively to the evolution of scholarly communication, a view supported by Rieger (2008) who affirms that in building an IR, libraries reinvent themselves.

Librarians therefore will have to take up new roles. According to Crow (2002), librarians will have the role of organizing and maintaining digital content—as well as supporting faculty as information contributors and end users., Libraries are best-suited to provide much of the document preparation expertise (document format control, archival standards, etc.) to help authors contribute their research to the institution's repository. Similarly, libraries can most effectively provide much of the expertise in terms of metadata tagging, authority controls, and the other content management requirements that increase access to, and the usability of, the data itself. In doing this, he affirms, the relevance of the library (and librarian) to faculty and institution will by and large increase.

IRs provide an institution with a mechanism to showcase its scholarly output, centralize and introduce efficiencies to the stewardship of digital documents of value, and respond proactively to the escalating crisis in scholarly communication (Foster & Gibbons, 2005). Further Jain *et al*. (2009) and Crow (2002) maintain that an IR provides benefits of increased visibility and prestige whereby it is hypothesized that a high profile IR could be used in marketing to attract high quality staff, students and funding.

For authors and contributors of content, the IR avers to help in dissemination of scholarly outputs including grey literature. Dissemination has a link to research impact with some studies (Jain *et al*., 2009) estimating that OA articles are cited up to 250% more than closed access articles. IRs are also marketed to authors on precincts that it offloads the tasks of management of materials to the library since it is assumed that they may lack

time, resources or expertise to it themselves. IRs are also seen as capable of heralding feedback and commentary and hence facilitate a two-way communication between the readers and authors. Crow (2002) also notes that IRs remove the physical page constraints that are pertinent in print, and thereby expanding the amount of worthy research that can be made available for review. Other benefits albeit technical include ability of IRs to offer persistent links to resources hence making it easily identifiable and sharable, and, in the case of grey literature, identifiable to potential publishers.

Success stories of effective IR implementations abound. Lambert *et al.*, (2006) shares the implementation of an IR in a large multi-disciplinary scientific research Council for the Central Laboratory of the Research Councils (CCLR) where a repository based on E-prints was effected for management of technical reports, a form of digital grey literature. Schöpfel & Prost (2009) surveyed OA repositories in France and their preliminary findings indicated a growth of 168% in the number of archives from an initial 68 a year earlier, with grey literature constituting an impressive 74% of archived contents.

On the other hand, IRs are faced with myriad challenges. Jain *et al*. (2009) identifies costs, difficulties of generating content, sustaining support and commitment, rights management issues, working culture, policy issues and lack of incentive as hindering factors to the growth of the IR movement. In his justification, Ware (2004) laments on the slow growth of content in IRs. In his 2004 survey of 45 IR implementations in the United Kingdom, repositories were found to have an average of 1,250 documents per repository, with a median of 290. Given the resources spend in establishing and

sustaining an IR, this is a significantly low figure that begs for reasons for slow adaption rates from the authors, despite apparently persuasive benefits.

b) Disciplinary Repositories

Disciplinary repositories are considered antecedents of the IR. They too are defined as web based databases of scholarly material defined by discipline. These were developed with a communication model in mind to quickly disseminate the research outputs of research (Blau 1964; Crow, 2002; Lynch, 2003).

The most commonly cited successful disciplinary repository is the arXiv, which was started in Los Alamos National Laboratory in 1991 by Ginsparg, accepting electronic preprints in high energy physics (Kim, 2010). It evolved to become the largest non-peer-review research reports deposit available worldwide. It is a fully automated electronic archive for research papers in physics and related disciplines: mathematics, non-linear sciences, computational linguistics and neuroscience. The increasing possibilities brought about by electronic scholarly publishing, together with its importance in the context of scholarly information communication, are the driving forces behind its success in archiving, preservation and provision of access to scientific grey literature collections. This was a means for distributing research results organised by and for physicists, with no intermediaries, which was entirely independent from any commercial circuit for scientific publications. In this sense, the server (which contains over 350,000 documents today and represents a third of the global physics research output (Jain *et. al*., 2009) corresponded exactly to the definition of grey literature (Schöpfel, 2006).

Disciplinary repositories have been successful mainly in academic disciplines that have an established pre-print tradition, which have then developed electronic mechanisms to facilitate the sharing and storage of research pre-prints. Pre-prints in this context are considered a form of grey literature. Other disciplinary repositories include RePEc for economics, CogPrints for cognitive science, NASA Technical Reports Server (NTRS) for astronomy and astrophysics; Archaeology Data Service (ADS) for Geophysics; Networked Computer Science Technical Reference Library (NCSTRL) for computer science; Digital Library of Information Science and Technology (DLIST) for library and information sciences (Crow, 2002).

According to Correia and Neto (2002), some disciplinary repositories began as ad hoc vehicles for dissemination of preliminary results, but some evolved to a more formal means of efficient sharing of results among peers in a field. They see e-prints as an efficient information communication media for disciplines where rapid dissemination of essential. This outlook is further supported by Shehata, Ellis, & Foster (2015).

Luzi (2000) on the other hands sees that e-prints was necessitated by the rapid turnaround time in scholarly fields, which the traditional publishing model was not quickly responding to due to the slow nature of publishing. Disciplinary archives thus evolved in response to the slow dissemination model, dissatisfaction with intellectual property rights of transfer of copyright from author to publisher, and poor peer recognition and visibility amongst colleagues. According to her the current peer review practice of publishers is too rigid and works against expression of new ideas by favoring publication of papers

originating from authors in the more prestigious organizations, and causing unnecessary delays, something she opines the pre-print repositories could help solve through rapid dissemination of research works. This is further opined to be the case for subject repositories (Björk, 2014).

Interest in repositories in general (institutional and digital) is informed by value offered in OA systems. These, according to Du (2010) seem to lead to a possible solution that could alleviate the financial burden on academic libraries while providing substantial support for learning and scholarship with reducing costs. In the context of this research, they represent a systematic leverage for grey literature management that need not be confined to the institution and librarians' practice.

c) Self Archiving Web Pages

Personal or departmental websites are considered another way of self archiving (Kennan 2008), and therefore present a method of digital grey literature management by its creators.

Kim (2010) says that the term author self archiving is a broad term often applied to the electronic posting, without publisher mediation, of author-supplied research. A personal web site, IR or a discipline-specific repository is used. The deposited material is often in form of pre-prints (which is a form of grey literature) but sometimes post-prints are posted, though it is not limited to this and researchers could post datasets, models, working papers and all forms of grey literature.

Policies of traditional publishers concerning author self-archiving of published papers vary, as does the stringency with which the policies are enforced (Kennan, 2008). The response of academic authors themselves to such policies runs the gamut from strict adherence to utter indifference. There is growing aggression to publishers allowing authors to self archive. The Sherpa/Romeo project commissioned by Joint Information Systems Committee (JISC) is one such database that lists the various publishers and their policies on self-archiving, with the view of informing authors of friendly publishers.

Banks (2006) gives a short synopsis of evolution of the self archiving movement. It began in 1994, with the publication of "The Subversive Proposal" by Harnad. And right from its outset, it received much criticism, with some terming it 'vanity press' (Kim, 2011) due to apparent lack of quality control. However, Harnard was quick to mention that self-archiving post-refereed drafts was not vanity press since the documents went through peer review. The greatest challenge has so far been poor up-take. According to Banks (2006), the movement has not flourished much because researchers in many disciplines are not accustomed to taking responsibility of their work, and have not changed their habits even in the digital environment that provides easier systems for managing digital outputs.

Xia *et al*., (2012) review the success of author self archiving in a ten year period and note that although considerable success has been attained by enforcing institutional mandates on author self archiving, a number of policies also seem to have no impact on the movement. They conclude that policies by themselves may not necessarily change the

existing practices of scholarly self archiving. This calls for deeper faculty understanding to what would increase the deposit rates beyond the mandates.

2.1.10 Factors Affecting Faculty Motivation to Disseminate Digital Grey Literature

From the review of literature, a number of factors based on the SET and the SC theory were found key in affecting the motivation of faculty to organize and disseminate digital grey literature. This primarily revolve on faculty self archiving in institutional, subject, or self or departmental web pages, given that digital grey literature predisposes its organization and dissemination to the creators of the works. These have been summarized below in five categories as : a) Costs b) benefits c) Contextual Factors

a) Cost Factors

i) Additional time and effort

Foster and Gibbons (2005) in their study of faculty sharing behaviour found out that clerical work and any work that impends effort towards their core activities of teaching and research was unwelcome. Faculty also do not want to do anything complicated in relation to disseminating to IRs. This view is reiterated by Kim and Stanton (2016) who note that faculty were concerned about the additional clerical duties that may be encountered in sharing research data. The additional work was further seen to require faculty to attain a new set of skills further eating to their time that they would be concentrating on other tasks.

In the context of IRs and digital grey literature, entering metadata is considered a time-consuming task, which discourages authors‘ contributions to an IR. Carr et.al, (2007) analyzed keystrokes to find out the amount of time taken by faculty to deposit in the University of Southampton` repository, and found that it took approximately ten minutes. Considering the amount of time taken to write a journal article, this may not be considered much, yet faculty cited that time to be much.

Harnad (2006) identifies the prophylaxis of Zeno's Paradox by countering reasons why faculty will not self archive and notes in relation to the additional time and effort, that faculty perhaps need stop sitting on their hands and do the keystrokes which, if mandated they would otherwise perform.

ii) Copyright concerns

Several studies concerning digital grey literature management and self archiving suggest that uncertainty about copyright is one of the barriers that impedes the participation in self-archiving practices (Abrizah, & Wee, 2015; Cullen & Chawner, 2011; Foster and Gibbons, 2005; Kim, 2010). This relates to violating copyright provisions of the publishers (Björk, Laakso, Welling, & Paetau, 2014). Paradoxically, faculty did not have such copyright considerations when submitting their work for publishing, and would publish with a publisher with stringent copyright provisions. Some faculty actually perceive it to be illegal to self archive (Harnad, 2006) and imagine it possibly as a form of piracy.

Faculty generally do not seem to know who owns the copyright of their works, and seem less concerned of the same (Gadd, Oppenheim, & Probets, 2003; Covey, 2009). Faculty also do not seem to be much aware of their institution's copyright policies. As such, copyright issues do not seem to be really at the forefront of many faculty when it comes to archiving their works, and this is translated to mean that they would consider it a great impediment to archiving their works in OA repositories.

b) Benefits

Accessibility of a document is defined as any that enables readers - to access the document independent of the author, and in a stable manner, over time (Kling & McKim, 1999, p.897; Harnad, 2006). For long-term and stable accessibility, institutionalized stewardship was necessary and it was enhanced by shared standards, indexing mechanisms and professional practices. While Kling and McKim criticized the lack of stewardship in electronic publishing practices, IRs are an exceptional case emphasizing organizational stewardship of digital documents created by members of a university community. DSpace IRs, in particular, provide persistent identifiers to all deposited documents, and thus each document has a unique and unbreakable URL. In addition, the Open Archives Metadata Harvesting Protocol (OAI-PMH) is a shared standard used in IRs and some disciplinary repositories, such as arXiv or DLIST. The OAI-PMH was a mechanism for harvesting XML-based metadata from repositories, and therefore, it makes possible interoperable search and retrieval among repositories. Moreover, the accessibility of an OA article via search engines was an important factor that would encourage its use (Crow 2002; Lynch, 2003).

The subject and IRs therefore make attempts to try to make work accessible perpetually, and hence attempt to address access, which is a perceived benefit to the academic community.

i) Publicity

Publicity of research literature is defined as having primary and secondary audiences acknowledge the availability of the document. It represents a series of activities from subscription, report lists, abstract databases, advertising and special issues, and citations (Kling & McKim, 1999). Crow (2002) on the other hand views visibility by placing items in an IR producing this publicity not merely for the scholar, but also for the institution and in doing so, placing the institute on the global map and attracting research funds, prestige and other benefits which eventually benefit the faculty. This view is also supported by Lynch (2003) who opines that delegating such a task to an individual faculty incurs much hurdles as compared to an institutionally operated repository.

Publicity is often accompanied by the added benefit of citations. When a document is publicly available, it tends to be cited more. Researches over time (Ghasempour, & Yaghtin, 2015; Harnad, 2015; Ware & Mabe, 2015) have known that OA articles have enjoyed greater citations than their closed access counterparts, with the varying results ranging from 25% to over 50% higher citation rates.

Koler-Povh, Južnič, & Turk (2014) analyzed 14 international journals with impact factor in the Civil Engineering field that were OA and found out that while OA is not a

sufficient condition for citation, it increased the number of citations for articles published in journals with high impact.

ii) Academic rewards

Academic reward systems include tenure and promotion which is based on research performance and other factors, such as teaching and service. Quantity and quality of publications are major indicators of this performance, although impact of one‘s research is increasingly an important factor on tenure and promotion. In the context of digital grey literature, it includes awards bestowed upon completion of the tasks such as graduation in the case of thesis and dissertations.

Kling, Spector and Mckim (2002) suggested that citation counts were considered one of the indicators of the quality and impact of publications. In addition, the place of publication, such as peer-reviewed journals, and book reviews were used to evaluate scholarly publications for tenure and promotion purposes. Those indicators, however, were well known to be imperfect despite being employed widely as effective criteria. They argued that publications of electronic versions of manuscripts (e-scripts) on the Internet should be assessed carefully based on whether or not those e-scripts were peer-reviewed, in order to be counted toward tenure and promotion. In fact, a study regarding the University of California faculty attitudes and behaviours regarding scholarly communication suggested that faculty members overwhelmingly rely on traditional forms of publishing, such as peer-reviewed journals or monographs which the current tenure and promotion system values. The study pointed out that the academic reward system

impeded faculty adoption of a new publishing model. It was also found that once faculty members published an article or a monograph, they tended to be less concerned about disseminating their final publications. This indicated that faculty considered the act of publishing itself to be sufficient for accomplishing their goal.

Since self-archiving is related to the process of dissemination after publishing, and after the core role of the item has been achieved in the case of grey literature, an academic reward structure that emphasizes conventional publishing is a factor that impedes the faculty participation in self-archiving practices.

iii) Recognition

According to Ziman (2001), professional recognition in science is attained through publishing in reputable journals, getting cited by other scientists and attribution of ideas and concepts to the researchers. Due to the problem of information overload, it is very difficult for scientists to receive attention from other researchers, thus making professional recognition an important factor. Although trustworthiness and prestige in self-archiving forums are questionable, some studies suggested that increased visibility of researchers‘ work could be a major benefit provided by self-archiving practices (Crow, 2002; Swan & Brown, 2005). Crow attested that IRs enabled broader dissemination and increased use of contributed materials. This, in turn, drove professional visibility and awareness. Swan and Brown (2005) also mentioned that academic authors‘ primary objectives for publication were to communicate their research findings to peers, and therefore, peers were able to build upon the results. Professional recognition, therefore,

was closely related to the publicity factor regarding citation and potential impact of research work. Faculty members are not only members of their scientific communities, but also members of a university community. Thus, institutional recognition is also of interest to university faculty. This construct applies primarily to IRs.

Knowledge management studies have suggested that by contributing to knowledge repositories, employees expected enhanced reputation in their organization (Hall, 2001; Kankanhalli *et al*., 2005). However, those studies are concerned with a corporate environment different from a university atmosphere where faculty members are free agents rather than workers for hire. Thus, faculty members are assumed to be more interested in professional than institutional recognition. Depending on the tenure system and the number of tenure and promotion reviewers who are outside one‘s discipline, there might be more of an incentive for institutional recognition in some universities.

iv) Altruism

Harnad (2006) claimed that ―there is an element of golden-rule reciprocal altruism underlying self-archiving, insofar as user-access alone is concerned, but when it comes to author-impact, self-archiving is a matter of pure self-interest (p.9). In a similar vein, Tschider (2006) noted that OA publishing was regarded as―the act of gifting scientific knowledge, which in return, resulted in citations of OA articles. In this respect, OA publishing―can beboth self-interested and somewhat altruistic. Cronin (2005) also suggested that self-interest and altruism connected to the increasing adoption of OA publishing and self-archiving, because academic authors were interested in making their

articles easily accessible. Cronin stated that authors‘ self-interests in OA publishing and archiving reflected their needs for ―branding, competition, and vanity (p.33) in scholarship. In addition, Odlyzko (2002) mentioned that whether academic authors liked it or not, they were involved with a ―war of the eyeballs (p.18) to which the ease of access was critical. Concerning the idea of reciprocity, Wasko and Faraj (2005) suggested that when people considered knowledge as a public good, they expected ―generalized reciprocity, defined as ―help given to one person is reciprocated by someone else, not by the original recipient of help (p.169). They also saw knowledge sharing as motivated by moral obligation, rather than by self-interest.

Kankanhalli *et al*. (2005) also suggested that knowledge contributors might be motivated by satisfaction with their altruistic behaviour, that is, helping other people by depositing content to knowledge repositories. Merton (1988), however, argued that ―free and open communication in science was an institutionalized practice, as opposed to altruism. By ―free and open communication, Merton meant traditional publication systems in which scientists obtained recognition by peers, the essential extrinsic reward in science. Yet, Cronin noted that he was ―inclined to think that Merton would have welcomed the communicative transparency of open-access publishing (p.7), since Merton suggested an idealized structure of science based on four norms - universalism, communism, disinterestedness, and organized scepticism.

c) Contextual Factors

i) Trust, Norms and Culture

Nahapiet and Ghoshal (1998) define trust as ‘a willingness to be vulnerable to another party’ (p.254). This willingness results from four beliefs: (1) the good intentions and concern of exchange partners, (2) their competence and capability, (3) their reliability, and (4) their perceived openness.

Specifically in the case of IRs, faculty contributors need to have trust in their institutions and the integrity, wisdom and competence of people who manage and preserve work submitted to IRs (Lynch, 2003). In this respect, Chan (2004) noted that if faculty lacked of trust in the library‘s long-term commitment to IRs, they would be less likely to contribute. Faculty also worried that they would forfeit ownership of their work by depositing it to IRs (Hess and Ostrom, 2004).

Van Raan (1997) noted that scientists would never post their pre-prints or other types of digital information including their premature ideas on the Internet, because it was possible for someone to take over their ideas without proper citation. Similarly, Crow (2002) and Davis and Connolly (2007) mentioned that the possibility of plagiarism and criticism of non-peer reviewed work made contributors reluctant to deposit their work in IRs.

The cultures among subjects differ significantly. Swan and Brown (2005) described researchers in pre-print cultures as distributing drafts of research articles before they have been peer reviewed to colleagues around the world. The purpose of making their pre-prints publicly available was summarized as the three following aspects: (1) to establish

ownership of the research, (2) to develop a certain area of study, and (3) to request commentary prior to final revision and submission of the articles to scholarly journals. As previously noted, Kling *et al.* (2002) examined another type of pre-print practices called the 'Guild Publishing Model', where working papers, technical reports, research memoranda, and occasional papers are the norm. This publishing model is most common in artificial intelligence, computer science, mathematics, economics, linguistics, and physics. It is also suggested that the culture of sharing pre-prints was constructed, dependent on journal acceptance rates varying in disciplines. Several other studies have hypothesized the positive relationship between pre-print culture and the adoption of OA venues, although the present study examines self-archiving of not only pre-prints but also other types of research materials, especially published articles. However, in some disciplines, preprints would never be shared as it is considered that they are not authoritative. This subject cultures are perceived to influence the information sharing of grey literature works directly.

The role of the library as an actant in digital grey literature management is also worth of consideration. Mackenzie Owen (1997) says that for grey literature producers, creating and distributing information products is not their core business. It is thus the role of the librarian to assume a pro-active acquisition policy as they are the ones explicitly charged with the role of creating and distribution information products and create an infrastructure for its distribution. He sees a triple role for librarians in managing digital electronic resources: creation and management of networked document servicers, where information is made available to the global network community; creating and maintain

search and access mechanisms which helps users to navigate through the networked information space and archiving for long term preservation and access. Librarians have their various reasons to shun grey literature. To start with grey literature is characterized by limited distribution or distribution outside conventional publishing mechanisms, poor bibliographic control, and non-standard formats. It is generated quickly, distributed as an in-depth response to specialized information needs, and directed to a specific, frequently small audience. This typically makes the task of acquiring grey literature complicated. For instance, Hartley (2004) experienced poor success rates for obtaining conference papers after a conference.

Mackenzie Owen (1997) sums up the librarians role in management of digital grey literature, a task which nobody else will do for them. He poignantly affirms that if the library does not solve this problem, nobody will and all information grey or white, will disappear from the memory of mankind.

There is a tremendous output of knowledge through grey literature variety and librarians should take the pragmatic approach towards it. The acquisition, processing, dissemination should be a part of collection development policies (Wessels, 1997).

The challenge of managing new electronic collections has required substantial new training, charting new policies and procedures in nearly all organizations. The electronic journal has its own caveats, as each element of the journal can be described, accessed and retained separately. With the creative work of aggregators, subscriptions can even be

acquired on an individual title basis as part of a mix of holdings from several publishers filling subject strength, rather than the traditional publisher-based offering of an entire list, where all coverage may not be necessary Gelfand (1998).

In the digital environment, the role of librarians occurs both at the tactical and strategic levels. Crow (2002) reinforces that establishing an IR program indicates that a library seeks to move beyond a custodial role to contribute actively to the evolution of scholarly communication. As long as traditional scholarly publishers remain part of the competitive landscape—likely for the foreseeable future—academic libraries will retain responsibility for managing and archiving traditionally-published print materials. He sees that llibrary programs and budgets will have to shift to support faculty OA publishing activities in order for the library to remain relevant to this significant constituency. For libraries with an organizational imperative to invest in the future, IRs offer a compelling response.

In summary, the most important consequence of the emerging role of digital information products and networked distribution is that libraries will have to move from functioning as acquisition-oriented memory organizations towards service organizations supporting and facilitating access to information on a network (Mackenzie Owen, 1997).

d) Individual Traits

Individual characteristics that might relate to self-archiving include faculty ranks, and the number of publications. Tenure-track professors have more pressure on them to publish their research work through prestigious channels, and therefore, self-archiving practices

would not be their priority. They might also be less motivated to self-archive in the IR of their current university than tenured professors, because it is possible for them to leave for another institution when tenure is not granted. It is assumed that, therefore, perception of tenure-track professors on self-archiving practices differs from that of tenured professors. In addition, the number of publications would affect authors‘ decisions to self-archive. Swan and Brown (2005) suggested that the more publications authors made per year, the more likely it was that they self-archive their research materials. The investigation of these individual traits will provide implications to design policies and services of IRs and disciplinary repositories.

2.1.11 Chapter Summary

A review of current literature shows that grey literature management has always posed problems in print and these problems don’t disappear in digital formats, despite technological tools that make acquisition and dissemination easier.

Digital grey literature is typically managed through institutional and disciplinary repositories, self-archiving author pages and library catalogues. A review of literature shows slow adoption of these systems, typically indicating barriers to knowledge sharing. Through SET and SC Theory, various factors are identified from literature and empirical studies that affect faculty management of digital grey literature in the OA context. The next chapter presents the methodology that will be employed to analyze them in light of meeting the objectives set in Chapter one.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology employed in the study. It is aligned to address the underlying research problem posed in Chapter one: The problem of availability of digital grey literature online through OA channels despite their increased production by faculty. It therefore seeks to design methodologies to address the four research questions presented in Chapter one. To achieve this, the underlying assumptions of what constitutes 'valid 'research is addressed in the form of paradigms in 3.2. This links to the research design adopted for the study. The population under study is discussed and the sampling methods and size are determined. The data collection methods, design and instruments are discussed. The researcher enlists the validity and reliability measures undertaken and discusses approach used in data analysis. Finally, the ethical considerations put in place during the study are discussed.

3.2 The Research Paradigm

This study seeks to address the problem of digital availability of grey literature works in OA channels (institutional and subject repositories; author archiving self pages). It seeks to understand how faculty currently organize and disseminate the academic grey literature they produce, and their underlying motivations. This understanding is deemed necessary to improve uptake and management of existing dissemination channels used by faculty and libraries. A number of approaches could therefore be adopted to achieve this aim and also answer the research questions presented in chapter one. Given that the

nature of the inquiry centres in trying to understand, to know, to dig deeper and comprehend the motivations and perceptions of faculty, it is felt strongly that an interpretivist paradigm be adopted. The interpretivist paradigm belongs to the qualitative tradition, and is well accepted in the study of information systems. They leverage on the fact that if there is one factor that distinguishes human beings from inanimate objects, it is in their ability to communicate (Creswell, 2009; Ekadharmawan, 2008; Klein & Myers, 1999; Saunders, Lewis & Thornhill, 2009).

A paradigm, defined as a basic set of believes or world view that guides the investigation, defines the ontology, epistemology and methodology of research (Creswell, 2009; Saunders *et al*., 2009). The interpretivist paradigm adopted in this study is based on the philosophical underpinning that research can never be objectively observed from outside. Rather, it is through the direct experience of the people. The role of the scientist here is therefore to understand, explain and demystify the social reality through the eyes of the participant. Interpretive studies therefore assume that people create and associate their own subjective and inter-subjective meanings as they interact with the world around them. Interpretive researchers thus attempt to understand phenomena through accessing the meanings participants assign to them (Klein & Myers, 1999; Gregor, 200; Saunders *et al*., 2009).

The focus of the interpretivist paradigm is on meaning and it sets out to seek, know and understand a given situation from social members (Gephart 1999; Patton 1990; Corbin & Strauss, 2014). It is based on the socially constructed knowledge such that knowledge is

not just detached outside, but rather is within the perceptions and interpretations of individuals. Knowledge is contructed by people. Therefore, one cannot go out there and analyze an entity by analysis of its parts. Rather, a wholesome approach must be embraced, one that seeks out the broader context in which people and the knowledge function.

Interpretive studies, in the context of information systems, seek to examine and understand how the information system is affected by the context, and how the context affects the information system. It does not seek to define dependent and independent variables, but rather focuses of the entire complexity of the system while attempting to make sense of it (Klein & Myers, 1999; Myers & Newman, 2007).

Interpretivist research treats knowledge and meaning as acts of interpretation and not as objective knowledge, as contrasted with positivist paradigms. It focuses and highlights on how society of individuals understand, know and sense making of events, happenings and situations employing the idea of interpretation (Corbin & Strauss, 2014; Gephart 1999). The key focus of interpretive research is theory building and to seek out meaning and understanding of the phenomena by invariably using in-depth interviews, thorough observations, grounded theory development and case studies (Creswell 2009; Patton 1990; Gephart 1999; Denzin & Lincoln 2005). The paradigm has influenced the research instrument and semi-structured interviews will be used as the instrument for data collection.

Research is undertaken as a scientific study of an identified problem. As such it is composed of three core attributes pegged on the paradigm: Ontology, Epistemology and Methodology. These three ought to work in tandem to produce a correlated system that allows the subject under study to be viewed in entirety. The choice of the interpretivist paradigm subsequently affects the leaning on the ontology, epistemology and research method. It forms a sort of research 'onion' with the 'inner' layers being affected by the outer layer (Creswell, 2009; Oates, 2005; Saunders *et al*., 2009). This initial choice of the paradigm therefore affects subsequent research choices.

This research adopts a relativist ontology with underpinnings that there are multiple subjective realities out there, and it is the role of the researcher to discover them by immersing himself into the study rather than being 'spectator'. Therefore, the researcher interacts with the participants so as to derive rich understandings from their experiences and understand the meanings the participants assign to experiences. The study adopts a subjectivist epistemology. Here, the researcher and respondent co-create understandings to the phenomena. Through use of language, meaning is socially constructed by the researcher and participant to arrive at shared meanings. The researcher is therefore not a neutral observer. The meanings could change over time. The research method adopted is the one that favours this kind of interaction, and for this study, the case study methodology is seemed appropriate. Their own assumptions, beliefs, values and action will inevitably shape the research process and affect the situation. Multiple explanations are therefore deemed possible. The paradigm will therefore guide the researcher in choice of research method, data collection, interpretation and presentation as discussed in 3.3.

(Creswell 2009; Denzin & Lincoln 2011; Lee & Baskerville, 2003; Myers & Newman, 2007; Oates, 2005; Patton, 1990; Saunders *et al*., 2009)

3.3. The Research Method

This study employed a single case study research design, with the unit of analysis being SU. According to Yin(2003), 'a case study is an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between the phenomenon and context are not clearly evident' (p.13).

As a research strategy the case study research method has been selected for this study because:

i) The research is explanatory. Case studies are appropriate when 'why' and 'how' questions are asked. These questions are explanatory and likely to deal with operational links needing to be traced over time, rather than mere frequencies or incidence. (Patton, 1990; Klein & Myers, 1999). In this case, the researcher intends to find out the whys and hows of digital grey literature management, and the case method renders itself suitable.

ii) Case studies go well with the chosen paradigm – interpretive paradigm. The paradigm chosen guides the researcher in choice of research methods. The interpretive paradigm favours naturalistic methods such as the case study (Patton 1990; Saunders *et al*., 2007; Silverman 2005; Yin 2003).

iii) The case study methodology does not require spending significant periods of time on the field as required by other qualitative techniques such as ethnographies (Patton 1990; Saunders *et al*., 2007; Silverman 2005; Yin 2003).

iv) Given the time allocated for conducting this thesis, the case study is particularly found suitable to delve indepth and get a rich understanding of the phenomena under study (Yin, 2013).

The unit of analysis for this case is SU. The rationale for selecting SU is twofold:

i) SU has persistently ranked top ten in Kenyan universities for the last seven years according to the Web Rankings of Universities (Webometrics, 2016). One key factor used to rate universities is the web presence particularly of scholarly content. Strathmore shows indications of digital grey literature production in quantities that warrant proper management practices. This is by itself is a pre-condition for the study.

ii) SU runs an institutional repository – one of the tools used to manage digital grey literature. Though the repository has been operational for the past seven years, the producers of digital grey literature have not rushed to populate it. This case therefore renders itself appropriate given the aim of the study.

3.4 The Study Population

The study population was composed of producers of digital grey literature (full-time academic teaching staff). This therefore comprised of a study population of 49 full time academic staff involved in teaching. This cadre is selected as it is deemed potential

producers of digital grey literature, given that a minimum level of publishing is prerequisite for attainment of this position. The publishing process often involves activities that produce digital grey literature. Their expected active role in research therefore predisposes them to be producers of some form of digital grey literature. Part-time lecturers were excluded from this study because their terms of tenure is often limited to teaching and they are not necessarily obliged to participate in additional activities undertaken by the institution. This includes being tied down by mandates such as the OA mandate of the library for the IR.

3.5 The Sample Method and Size

The study engaged one main group: full time academic staff. To get data, stratified sampling was used to seek representation of the teaching faculty from each department. SU had eight academic centres comprising two faculties, two institutes and four schools.

Table 3.1: Schools, Institutes and Faculty at SU

School /Institute/Faculty	**Full Time Academic Staff**
Strathmore Business School	6
School of Accountancy	8
School of Finance and Applied Economics	5
School of Humanities and Social Sciences	7
Faculty of Management and Commerce	7
Faculty of Information Technology	9
Institute of Tourism and Hospitality	4
Institute of Mathematical Sciences	3
Total	**49**

Given that full-time faculty worked across institutes, faculties and schools (for example the Strathmore Business School, School of Accountancy and Faculty of Management and Commerce) the researcher stratified the groups across subject disciplines. This gave rise to four representative Subject disciplines as indicated in Table 3.2:

Table 3.2: Study Population by Subject Discipline

Discipline	**Population**	**Target**
Information Technology	9	6
Business, Commerce and Management	21	6
Mathematics and Financial Mathematics	8	6
Humanities and Social Sciences	11	6
Total Population	**49**	
Total Number to be Interviewed	**24**	

Stratification is reckoned mandatory for account for subject differences that abound amongst faculty, and hence possible practices accorded to digital grey literature.

Participants were selected purposively from each department and invited to participate in the research. Each positive response elicited was followed up with a phone call for introduction purposes, as well as proposal for interview appointment. All the appointments adhered to the participant's schedule to ensure comfort prior to the interview. The interview questions were sent to the participants earlier to allow them engage in some preparation and familiarization. Although this may have resulted in some loss of spontaneity, it increased the depth of the answers got.

Sample size in qualitative research, according to Patton (1990) is a matter of judgement and experience in the following: evaluating the quality of the information collected against the uses of which it will be put; use of the particular research method; and purposeful sampling strategy employed. She says that an adequate sample size in qualitative research is one "that permits, by virtue of not being too large, the deep, case-oriented analysis that is a hallmark of all qualitative inquiry. That also results in, by virtue of not being too small, a new and richly textured understanding of experience" Kumar (2005, p.165) expresses a similar view and affirms that with qualitative research, the issue of sampling has little significance since the main aim is hardly ever to statistically generalize. A study based upon the information obtained from one individual, or undertaken to describe one event or situation is perfectly valid. In qualitative research, to explore the diversity, saturation point is what is often used. Data collection continues as long as the researcher keeps on discovering new information. When no new data is got or when what is got is negligible, the researcher stops. However, saturation point is a subjective judgement that is left to the discretion of the researcher. The researcher attained saturation point with 21 interviewees.

3.6 The Data Collection Methods and Instruments

Case study research typically involves gathering data from several sources. (Yin, 2013; Creswell, 2009) also notes that the employment of multiple sources of evidence in case study research is intended for triangulation purpose which is useful for enhancing the reliability and validity of the findings.

The study employed interviews as the chief data collection instrument. The choice of interviews was motivated by the underlying research aim of understanding how faculty manage the grey literature they produce and their underlying motivations. Given the need for in depth answers, and in view of the underlying paradigm adopted, interview was deemed the most appropriate data collection instrument. A semi-structured interview was adopted and designed to answer the research questions posed in Chapter 1.

Semi-structured interviews were adopted for this study to enable the researcher relatively stick within the context of study, while giving the interviewees enough open-ended questions to discuss along the themes of the study. This was deemed necessary given the experience of the researcher in conducting qualitative studies as well as to abide within the time confines provided for the study.

It is noted that as the key data collection instrument, interviews introduce elements of added risk that could affect data gathered. According to Yin (2003) they include:

a) Participant bias: biases common when people are the data sources. This could happen due to inadequate construction of interview questions such as questions that are intimidating or unfriendly. As a result, interviewees may become defensive or hesitant to provide information. As a countermeasure, a pilot study was conducted to ensure the questions are reasonably constructed and the interviewee did not have a fear of expression in answering. Consequently, questions that sought to find the ‘trust’ and ‘norms’ of the institution were more open-ended to allow free expression.

b) Incomplete recollection: this risk refers to a situation where inaccurate information is collected due to interviewee's poor memory. To mitigate this risk, the interview questions were designed to enquire in a systematic way by exploring interviewee's latest experiences first so as to stimulate positive feedback.

c) Reflexivity: this risk refers to interviewees tendency to give the interviewer what the interviewees think the interviewer wants to hear. As a countermeasure, the researcher employed mostly open ended questions particularly at start of the interview so as to avoid providing hints of expected answers to interviewees, followed by probing.

For this reason, the researcher triangulated by establishing a chain of evidence using secondary data sources. Digital grey literature renders itself appropriate for review of web documents, and this was further used for triangulation. Where faculty said that they had shared digital grey literature in open forums, a quick internet search was done to validate after the interview.

3.7 Design of Research Instrument

The research instrument was based on research questions described in chapter one and the conceptual framework discussed in chapter two. The conceptual framework identifies significant factors related to phenomenon of digital grey literature organization and dissemination practices. This influenced the structure of the interview, analysis of data presented and the subsequent structure of the report. Table 3.3 summarizes this relationship:

Table 3.3: Research Question and Interview Question Relationship

Research Question	**Interview Question**
i) What forms of digital academic grey literature do faculty produce?	**2, 3**
ii) How do faculty organize the grey literature they produce?	**4**
iii) How do faculty disseminate the digital grey literature they produce?	**5**
iv) What factors influence faculty's decision to disseminate digital grey literature?	**6 ,7,8**
v) What measures can be put in place to facilitate better management of digital grey literature?	**7g, 8l**

Table 3.4 maps the relationship between factors identified in the literature review and conceptual framework, and the interview questions.

Table 3.4: Conceptual Framework and Interview Question Relationship

Factor	**Interview Questions**
Costs	7a, b (i-v) ; 8g, h, (i-v)
Benefits	7(vi-x); 8 e,f,g, h(vi-ix)
Contextual Factors	i, j, k, l

Following the design, a pilot interview was conducted on site with the first participants. This helped to test and refine the research instrument as well as the data gathering protocol. It helped the researcher gain experience and refine the researcher's interviewing skills. Additionally, questions on the context factor were modified to be broader so as to elicit more genuine views from participants.

Having modified and tested the instrument, the actual interviews were conducted. First, the faculty were invited to participate in the study based on the sampling methodology outlined earlier. They were invited through a participation letter as detailed in Appendix1. Upon a positive response, the interview was scheduled at the convenience and location preference of the interviewee. The interviewee was once more reminded of the objectives of the study, and requested to sign the participant consent form as provided in Appendix2. The interviewee was presented to with the interview protocol (Appendix 3) and informed that the interview would be recorded and notes be taken during the interviewing process.

Interviews were conducted according to the semi-structured framework provided in Appendix 4, with relative flexibility to assure understanding so as to derive a meaningful discussion. During the interview, the interviewer took margin notes against the interview questions for areas that were notable. Following the interview, the interviewer listened to the interview and made additional notes. This way, the understanding was iterative. The interviewer further took note of existing gaps to follow up in subsequent interviews and the themes that were emerging in the current interview.

The same protocol and research instrument was repeated in each faculty interview. Yin (2003) says that this should improve the reliability of the research as well as maintain uniformity of the data, hence simplify data analysis, a factor which the researcher benefited from.

3.8 Validity and Reliability Measures

According to Patton (1990), it is not essential to the validity of the case study research method that a case study should be able to be generalized. In this type of research, generalization is not a central issue. The relevance of a case study is more important than its ability to be generalized. When a case study is carried out both systematically and critically and aimed at the improvement of understanding, then it is relevant. Yin (2003) however presents a different view on generalization. He presents 'Statistical generalization' and 'analytical generalization'. Case studies contribute to analytical generalization for the study under focus by providing a rich understanding of the phenomena. This is done by comparison of literature, frameworks and the emergent data from the case. It therefore contributes to a deeper understanding of how faculty understand grey literature. This consequently presents opportunities for specific changes in implementation practice for practitioners (librarians) managing the grey literature. As such, the case contributes to analytical generalizability.

In designing a case study research, Yin (2003) suggests the development of a case study protocol as it is useful for enhancing the reliability of the research and the integrity of the data, as it provides a guideline for conducing each of the cases in a similar manner. Yin's suggests a framework of a case study protocol to include:

i) An overview of the case study research which outlines the research objectives, case study issues and presentation about the phenomenon of interest.

ii) Field procedures which provides a reminder of the procedures, credentials of assessing data and location of the sources

iii) Case study questions : which outlines the questions that the researchers need to remember during the data collection phase

iv) A guide for the case study report : which focus on the outline and the format of the report.

The researcher therefore used the case study protocol and developed a case study database to improve on the reliability of data collected. The protocol is availed in Appendix 3.

Yin (2003) suggests measures that could be used to reinforce validity of case study results. He suggests that the researcher uses multiple sources of evidence and establishes a chain of evidence to improve on construct validity, and that in single-case study, a theory be used to achieve external validity.

The researcher triangulated results with documentary evidence gathered from the online library catalogue and the internet where it was possible. This consequently improved the validity of the data collected.

3.9 Data Analysis

Following data collection of each interview, the researcher reviewed the notes they had coded on the interview sheets, and listened to the audio interview. This resulted in additional annotations on the main concepts brought out in the interview. This was done

after each interview and enabled the researcher to identify when saturation point had occurred, when no new themes were forthcoming.

The researcher converted the recorded audios from the .aac format used by the recording software to .mp3 using the open-source software audacity (www.audacity.com). This software was used to split the audio recording into miniature ten-minute intervals to enable the use of a free transcription software, Express Scribe (www.nch.com.au/scribe). Transcription was conducted following the guidelines provided by Dresing and Thorsten (2015). The use of Express Scribe came with the benefit of time-stamps in the transcripts and this enabled the researcher to quickly playback a particular segment during analysis to seek clarification.

The resulting transcripts were loaded to MaxQDA software. The software facilitated the researcher to map codes, extend them to categories and eventually themes. The framework presented in Chapter two was used to aid in coding when there was a natural fit. For example, concerns about copyright. However, when no natural fit occurred, new codes were introduced. The software also aided in retrieval of the coded data for purposes of pattern identification. The themes were then exported individually to a Word Processor (Ms Word), and the researcher, through a process of induction and deduction identified major findings and presented them in a coherent framework backed up with narrations. The themes identified in literature were used, and additional themes were discovered in this process. These are presented coherently in Chapter 4 in answer to the research questions posted in Chapter one.

3.10 Ethical Considerations

a) Informed consent :The researcher sought informed consent of the participants. Participants were explicitly informed that participation would be voluntary and adequate measures would be taken to ensure the privacy of the information collected. They were required to sign a participation consent form that is presented in Appendix 2.

b) Bias: The research is based on an interpretivist paradigm, where the researcher is part of the study. To prevent a situation where there is completely no objectivity, both from the researcher and interviewer, the researcher used the Case study protocol. The protocol assisted in minimizing bias at administration and attaining consistency in reporting. The interviwees could also chose to remember selectively. The research instrument was designed to minimize this by asking open ended questions, and asking questions systematically so as to establish a truth flow. Further, the researcher triangulated the data received by doing a quick online check to establish if indeed the researcher had shared their works online. Literature was also used heavily as a fall back in pattern matching to establish cause-effect relationships.

c) Anonymity: Personally identifying data was needed to identify the correct respondents for interviews, having been invited to participate through e-mail. However, separate lists of contacts and responses were maintained, and the contact list was purged following completion of the study. In analysis, personally identifying information was coded.

d) Plagiarism: The researcher committed to acknowledge secondary sources of information used to undertake the research. Further, the researcher checked their work with anti-plagiarism software to ascertain that sources had been correctly credited.

3.11 Conclusion

This chapter positions the research in this thesis in the spectrum of approaches identified in literature as justifiable in selecting a specific methodology to conduct scientific research. The paradigm adopted is stated and justified. The use of the stated methodology (single case study) is justified. The design of the instrument in relation to the broader research questions posed in Chapter one and the framework developed in Chapter two are presented. Procedures, processes and software used to gather and analyze data requisite to address research problem is presented. This chapter also details on the implementation of the selected research methods and techniques, showing how the protocols used contribute to data reliability, integrity and a level of generalizability.

In the next chapter, the result and findings of this single case research are presented along with some relevant discussions linking it with the research questions.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

The last chapter outlined the research methods that were utilized to address the research questions presented in Chapter one. In this chapter, the results of application of the methodology are presented, analyzed and interpreted. These also form the basis for developing the conclusions drawn in the next chapter.

First, the demographic data of the interviewees is presented. This is followed by the research findings, analysis and interpretations which is addressed through the research questions posed in Chapter one. In order to obtain depth of understanding of current practices accorded to digital grey literature and the underlying reasons, the data obtained from interviews was coded, categorized and analyzed. The conceptual framework presented in chapter two was used to draw the thematic framework of analysis and used for understanding digital grey literature management from the faculty perspective.

Result of this analysis process is presented in this chapter in form of research findings and discussions of relevant interesting aspects of these findings. The findings, analysis and discussions presented in this chapter are the basis for developing the conclusions of this research, answering the research questions as well as revealing possible future research directions.

4.2 Demographic Information

The aim of this study was to establish how faculty manage digital grey literature and the underlying motivations for such actions. Question 1 in the interview schedule sought out the demographic information of the participant including the academic title, subject specialization and length of service in academics.

The collected demographic data is summarized in the table 4.1:

Table 4.1 :Demographic Data of Interviewees by Academic Position and Experience

Position	**Length of Service in years**	**Number Interviewed**
Assistant Lecturer	0-5	8
Lecturer	5-10	7
Senior Lecturer	10-15	5
Professor	10-15	1
	Total Number Interviewed	**21**

Table 4.2: Demographic Data of Interviewees by Subject Discipline

Discipline	**Number interviewed**
Information Technology	5
Commerce and Management	6
Mathematics and Financial Mathematics	5
Humanities and Social Sciences	5
Total Number Interviewed	**21**

From data presented in tables 4.1 and 4.2, the sample size and distribution was considered adequate to give a representation of practices accorded to grey literature that takes to account discrepancy in subject disciplines as well as relative years of work

experience. This has been factored in the analysis and when the patterns emerging could be accounted to either of the variables, this has been attributed, backed by fall back to literature. What follows is the results of the research questions posed in chapter one in an effort to address the research aim and problem.

4.3 Forms of Grey Literature

The first research question sought to identify the forms of grey literature that faculty had produced, and of the ones produced, which ones were in digital form. The researcher explained to faculty what was meant by grey literature, primarily the scholarly research outputs that they produced, but which were not formally published as such. A description of grey literature and the shared understanding of the term was deemed essential given the controversy that exists in literature about definitions of grey literature. Findings on the grey literature produced by faculty are based mainly on transcripts of the interview question 1 (See Appendix 4)

The participants were initially asked to enlist the forms of grey literature that they had produced in the course of their teaching and research responsibilities, but not necessarily produced while they were working at the institution.

Through lists scourged in literature detailing what encompasses scholarly grey literature, and as identified in Chapter one, the researcher further probed the interviews on more possible items to be included in the list of grey literature produced. Through this process,

the researcher and interviewer unearthed a comprehensive listing of what was deemed as grey literature.

Table 4.3: Digital Grey Literature Produced by Faculty

Forms of Digital Grey Literature Produced by Faculty
1. Academic Manuals 2. Class Projects 3. Conference Papers 4. Course notes 5. Curricula 6. Key note addresses 7. Preprints 8. Project Reports 9. Research Data 10. Reflective Portfolios 11. Research Hour (Brown Paper) Presentations 12. Seminar Papers 13. Software Programs 14. Teaching Cases 15. Thesis 16. Working Papers 17. Workshop Presentations and Papers

Definitional controversies, as abound in literature (Luzi, 2000) on the nature of grey literature were evident in discussion with faculty on what comprised grey literature. Faculty were taken aback with the discovery that they had quite some grey literature in their possession.

Faculty spontaneous response to what forms of grey literature they had produced were initially directed to ‘traditional scholarly’ outputs such as thesis. After the initial probing is when faculty considered that their lecture notes, data, projects, cases also could be considered as a form of grey literature. This points out to the nature of grey literature as

an ‘elusive’ output, even to the creators of grey literature themselves. As such, interventions towards management of grey literature must actively enlist and lay surveillance to the forms of grey literature that they anticipate to be produced.

Grey literature produced by faculty, as anticipated, was mostly born digital. Interviewed faculty agreed that most of the works had been originally produced digitally. Even for some grey literature forms that eventually changed forms with eventual ‘publication’ such as workshop reports, preprints and conference papers, the original drafts existed in digital formats.

Faculty also seemed torn between what was really ‘grey’. This included works produced as a result of consultation, and for which the consulting agency would remain with the resource, such as training materials for workshops. Also, some faculty raised concern on grey literature that seemed to lack permanency, such as cases. This is well captured with SL3 concerns as below:

> *We’ve developed cases that are actually used in class. I’ve developed mine. Looking at a practical scenario, and I just composed the literature myself. but after that I don't know where they go. Coz these are short cases. Sometimes they are only usable for that moment. And when I find another scenario in which I need another one I may create another it. And the previous one, if another lecturer does not ask for it, I may just have to lose it.* ***SL3***

The findings are consistent with Moahi (2009) observations that with ubiquity of computers in developing countries, majority of literature is born digital. It also points out

to the ephemeral nature of this literature, which even to the author, proper archiving for retrieval may not be a pre-occupation of the creator of the works.

4.4 Organization of Digital Grey Literature

The researcher sought to find out how faculty organize the grey literature that they had identified. Faculty who had recently produced grey literature noted that in the first instance, the grey literature was produced in a digital format. As such the work was stored in the electronic gadget that originally was used to produce the work (personal computers, laptops) organized in computer folders.

> *The undergraduate one I have it in my computer, the master's thesis I also have it in my computer, in a folder somewhere. yeah. Backup? I have a thousand backups. On CDs, in my* e-mail*, in an online backup facility. So yeah, its private and secure.* ***L5***

In most instances, faculty indicated that they had copies of their works in flash disks and e-mail. Faculty cited that they used these mainly as a backup. Some faculty used dedicated online storage services to offer additional back up services for their grey literature such as cloud based storage services. (Google Drive, DropBox).

> *They [the teaching cases] are in my computer here, in my flash disk,* e-mail *and in fact all over, may be with some students. E-learning has some.* **SL3**

> *I've put the documents on Gmail, Google docs [now Google Drive] documents*
> **SL5**

Faculty organize their digital grey literature in folders stored at their desktops/laptops. Their digital grey literature is in formats that were originally used to create the

documents. Popular formats cited are Word for word processors, Excel for spreadsheets, PowerPoint for presentations, SPSS for data and PDF for final version of works. Other files are in specialized formats such as programming codes. After completion of work, most faculty back up their works on e-mail and online storage services. (Google Drive, DropBox).

Faculty use popular existing technology at the time of production of the grey literature to produce their work. Then given the nature of the grey literature, they do not seem to prioritize navigating the works to newer technologies over time. Navigation through the years from one format to the other, from one storage media to the other (such as when diskettes became obsolete) seem to be a challenge that faculty with more academic experience appreciate.

> *You know when we did these things, we used to use diskettes. //laugh//. Now those diskettes in fact I tried to insert them when they [diskette drive] were still available. They could not open. Sad. So actually I was waiting for [the librarian] he took it he was supposed to scan and give me a copy at least I have a soft copy but I have not got it yet.* ***L3***
>
> ***Respondent:*** *In fact what many people are doing now is to just put it on* e-mail.
> ***Interviewer****: have you done that yourself?*
> ***Respondent:*** *I have done many things on e-mail. I also tell my students, tell me your work on e-mail. Later on I hear students say oh my computer crashed.... oh my what. So do you have that old one that we had reviewed with you, that we can go and ... if you had sent on soft copy, you would not be having issues. At least that is an option now. Which we didn't have during our time. I remember that time e-mail we had a limit of 4mb. You couldn't do*

> *anything with 4mb. In fact one of the preoccupations was that which one is important is which is not s that I can delete so that more can come in. I remember, sometimes no more e-mails would come in. And if anyone sent an attachment [laugh]. But now* e-*mail is the best we have.* **L4**

Faculty seem to use existing technology to organize their existing digital grey literature. This is defined from the creation, storage and back up their works based on their level of expertise. As such selling the IR traditionally as an avenue for backup and storage (Crow, 2002; Lynch, 2007) may not send a strong appeal to the repository users. The repository additionally has to have support for the varied formats that faculty produce their grey literature works in. The clerical works of change of formats may also not appeal much to faculty. Faculty consider the existing backup mechanisms as sufficient, given that e-mail providers are increasing the amounts of online storage accorded to their new users unlike the initial days where online storage was minimized and hence inadequate.

4.5 Dissemination of Digital Grey Literature

To answer this research question, the researcher sought to find out what forms of digital grey literature the faculty share, with whom they had shared and the channels employed in sharing these grey literature. These are presented, followed with a discussion on dissemination practices of grey literature by faculty. The answers were solicited using the interview questions presented in Appendix 4.

4.5.1 Forms of Digital Grey Literature Disseminated

On forms that had been shared. Faculty indicated that they had shared their theses and dissertations, research hour (Brown Paper) Presentations, Course notes, teaching cases, class projects, seminar papers, reflective portfolios, curricular, conference papers, working papers, keynote addresses, and academic manuals.

> *ok. am lucky that my masters thesis is readily shared from the university's policy. Because they have this thing they call Electronic Thesis and Dissertations database. It is a site. As long as a thesis has been passed through the higher academic system, it qualifies to be online. And it is cited by many people who want to publish it.* ***SL3***

> *like my my reflective portfolios. the other day in fact I just sent it out to people. I sent it out to the other lecturers.* ***SL2***
> *I share my notes. But I would love to have them in a book form. That's what I really want.* ***SL1***

Faculty interviewed had not shared their preprints, the software code and the data from research. For preprints, faculty indicated that the paper had already been published and they did not readily perceive it as an independent output apart from the published journal article. They also felt the pre-print was before corrections and therefore was less authoritative and not suitable for publication.

> *[software code] it's part of a work in progress, where you want to perfect it, publish it and get all credit for being the originator of that idea. I wouldn't share.* ***L3***
> *Preprint? That one I would not share. You see it still had to be revised.* ***SL4***

4.5.2 Disseminating Digital Grey Literature

The researcher found out that faculty shared grey literature with three core categories. With the official disseminating agents, with known beneficiaries and with students.

Faculty share the grey literature they produce with the official disseminating agents. For thesis, these include post-graduate schools and library. For consultancy they give the final work to the consulting agency. For conferences, the conference paper is given to the conference organizers. For the commissioned case study, the cases were given to the commissioning agency. Faculty often perceive this to be sufficient and the end of their role in dissemination.

> *Yes I have disseminated my grey literature. I did this after doing the research. As a masters student. yeah. I was involved in a number of researches with others and those researches were followed by dissemination workshops. So we went back to the community and disseminated the findings of the study to the people and most of those people were leaders. They were various stakeholders within the community. Like district commissioners, health officials, Ministry of Health... the MOH, yes. So the various stakeholders were invited and the results of the study was disseminated to them. I would say I've disseminated my grey literature. We also wrote papers from these researches.* ***AL3***

> *A soft copy of my thesis... I gave it to the library.* ***L3***

> *one of the biggest problem with this kind of literature is the consultant and fee element that come with it. we are very protective of them. So we share with the consulting agent only.* ***SL4***

Sharing academic works with known beneficiaries such as colleagues was based on mutual relationships pegged on trust, and where criticism was not anticipated on the part of the recipient.

> *Yes. I share my research works with my friends. Based on friendship. Friends that cannot use it against me. [laugh]. Like publishing it and then by the time I want to publish I find they've already published it.* ***L2***

> *The others have been just one on one communications, you know. So it could be like some interesting report I have written.. So I might send it to a few of my friends whom I think that they could be interested in it.* ***SL1***

> *it depends on who they are. For me the issue is ... I don't want someone to say ... sir, this thing of your s is fake.* ***AL1***

Faculty shared their grey literature freely with students. This seems to be motivated by the 'superior' knowledge position, given that criticism is not anticipated. Faculty seemed to naturally share forms of their grey literature with students to motivate, inspire and direct students in the given research lines.

> *I usually disseminate its findings through classes. Coz I teach students I tend to give more examples based on my thesis coz it is something that I connect with. The examples come rather easily. So in the thesis, yeah, in class.. at least.****AL 4***

> *My thesis, I've always shared with students both masters and PhD, in terms of what came out.* ***SL4***

> *I also disseminated my thesis by the way. I gave it to one of the lecturers who was helping some students write a paper. Those students wrote a nice paper which was represented in Rome. Probably they got some ideas from that thesis.* ***AL4***

4.5.3 Channels used to Disseminate Digital Grey Literature

The researcher found out that faculty employed existing official disseminating entities to distribute the grey literature they had produced. In the case of thesis, faculty indicated that they had given a soft copy of the works to the library, a copy to their supervisors and graduate schools. In the case of consultative work, the copy was given to the contracting agency.

Faculty also indicated that they had disseminated the grey literature in their possession through e-mail. This was the second most frequent method cited by faculty as a dissemination entity. E-mail was preferred by faculty as they rendered it informal and available. Faculty indicated that the works they had shared through e-mail was mostly to known recipients either upon request, or upon their normal research and teaching activities. Faculty indicated that they found use of e-mail to disseminate digital grey literature appropriate, inexpensive and personal.

> *And I find the one on one* e-mail *communication ...aah easier and more personal. you know . Special with my friend. So it becomes a lot easier that way. And number two even when it is with my student. Then I know that this is the thing that this specific student needs. So I might forward it to them. You know. Yeah.* ***SL3***

> *I have done many things on e-mail. I also tell my students, Send me your work on e-mail. You see, we now have options. Not like those days I remember that* e-mail *had a limit of 4mb. That was very little. In fact one of the preoccupations then was to find which e-mail is not important so that you delete so that another one can come in. I tell you now* e-mail *you can do so much.* ***L4***

Faculty indicated to have used the IR to share their digital grey literature. This was mostly a mediated deposit conducted by librarians, particularly after trainings. Beyond that, they expressed an awareness of the repository for sharing of their digital grey literature, though it was not a natural spontaneous choice for dissemination.

> *To be honest I gave SU portal because the librarian kind of insisted. Let me be honest. I did not have any. I was indifferent. It ain't my natural choice.* ***AL7***

> *I think there was one time a librarian was walking me through I think it was Turnitin. Then she mentioned this repository. And am thinking shoot who uses any of this crap. Does it even really exist, is it even functional.* ***SL4***

> *SU portal ... hmm. What is in SU portal... can I really remember what is in SU portal?* ***AL5***

Faculty indicated that they had used the institutional intranet to share their digital grey literature. This included mostly use of the intranet to share teaching Cases.

> *But one is available in intranet. I have put my cases there.* ***L5***

Some faculty indicated that they had used departmental websites to distribute their digital grey literature. They acknowledged that the departmental websites were in their infancy, with mixed reactions on their willingness to use it as an avenue to share their grey literature.

> *aah SU here pshhhh. Here I mean I don't find the digital level of the university sufficient for much dissemination beyond* e-mail. *I mean like the departmental web page is not even developed as yet. You cannot find me on*

> *it. So the last thing that would be happening is me having a departmental web page on which to put anything of my own. You know.* **SL3**

> *Well, the department is in the process. We have small small web pages you can actually put your works there if you want. Am considering putting some of my works full text. I've just listed my researches there.* ***L4***

Faculty had used online social networks to share their digital grey literature. Faculty cited Google Plus and other online platforms such as Slide Share as avenues that they had used to share their research works. Others included Research Gate.

Faculty extensively used the institutions e-learning platform (Moodle) to share their grey literature. This was done as a part of teaching, and they did not consider it a form of sharing grey literature as such. It was considered part of their teaching process and the e-learning platform is a mandatory platform for the teaching role. Faculty did not consider their lecture notes and other teaching materials, whether original or not, as a form of grey literature instantaneously.

> *E-learning .. I believe its better than other means. It saves cost.. you see. I don't have to print for students and then they go print copies. If I put it here, they will access. and also the convenience. They will access when they need it. so convenience cost and also . the . I mean trying to ensure that we are all in the same page. Coz if I teach and I don't give notes, they will also be reading what's posted. But are these really grey literature?* ***L5***

> *E-learning is not difficult. Plus it makes it easier for students to access stuff.* ***SL3***

> *You just take it to e-learning and they pick it up.* ***L1***

Majority of faculty interviewed were oblivious of popular subject repositories in their discipline, and had not used them in sharing their digital grey literature. They were not familiar with EconPapers, Social Science Research Network (SSRN) and Arxiv for the Computer Science and IT disciplines. They were more familiar with commercial sharing sites such as SlideShare. Some faculty were also familiar with Open Educational Resources portals such as Merlot, and welcomed them as appropriate for sharing of digital grey literature forms since they accepted small bits of works (like animations, presentations) and with least criticism. Faculty interviewed were familiar with Research Gate, but none of them had deposited their works there. They admitted that they had retrieved

> *I've used Slide share.* ***AL4***

> *I know Slideshare. I haven't put yet coz I don't have too much original content, but I would if I had it.* ***AL6***

> *..but I use Slideshare, Slideshare is the one you create an account, and for you to continue accessing other slides, you have to upload some.* ***L2***

> *Merlot. So Merlot, if I was to post something, I would probably post first on Merlot and see how it's taken up before I take it to any other platform.* ***AL7***

For faculty, the sharing role is directly linked with the initial purpose for production of the gray literature. Once this has been achieved, there is no more motivation to share the work. Faculty do not also perceive this to be part of their 'business'.

> *I mean that matrix is very hard. Because if you say faculty should push for it, by nature, teachers and lecturers and professors, are not very friendly*

> *people. They are not people persons. Not because they don't want to do it, but they happen not to be marketers. That's why they didn't do marketing.* ***AL6***

> *So you're asking me to market my paper, that's what you are asking me? That is not part of my role. It doesn't excite me naturally...which is unfortunate...* ***SL3***

> *But then besides that it is a ... it is not even something that before this interview I don't think I have given it active thought like I should really share this thing, that I can put it on the net.* ***AL2***

Arising from the findings above, the following discourses can be made:

Faculty share Thesis, Project, Conference Papers, Cases Works perceived by the owners to be of acceptable 'quality' Works that present the owner in a superior knowledge facet, works likely to be minimally critiqued.

Faculty share their grey literature with the official distributing channels that commissioned the works (supervisors, library, Graduate School, Project Consultant, their students).

Even when the works are placed online, faculty do not visualize a 'global' audience for their work. Their immediate perceptions on sharing is with immediate, 'known' beneficiaries.

This implies any attempt of IR is selling itself as an avenue for sharing grey literature works has to be informed of the premise that faculty do not envisage the ‘global audience’ as part of their audience as appertains to digital grey literature.

It is critical to bear in mind that grey literature is produced in a context geared as a means to a given goal (say academic awards, assignments, presentations, teaching). When the main goal has been achieved, it is not automatic to the creator of the work that the work could/may be shared and reused. This comes as a secondary goal, often with 'secondary' benefits which cannot surpass the main goal for creation of the work. This seems to create a big inherent hindrance in the subsequent dissemination of grey literature works.

Faculty employ existing ‘formal’ distribution channels to disseminate their digital grey literature (library, consulting agency, e-learning platform ...). This is often deemed as the final mandate in distribution of their grey literature. Subsequent dissemination of grey literature seems to stem from secondary factors, and involves one-on-one sharing. Here informal and interpersonal channels are used to attain this dissemination role. This typically involves the use of e-mails. Marketing the IR as an avenue for sharing grey literature may not work once faculty have done their ‘mandated’ dissemination role. The library therefore has to employ creative methods since this is deemed a secondary or tertiary role with no instantaneous benefit to the sharing agency. It is not that faculty do not want to share, it is just that they feel they’ve already done what was supposed to have been done in sharing. Repositories are therefore perceived as an extended activity that is neither immediate nor natural.

Channels such as Slideshare that require users to contribute something before they are able to access other users content are deemed successful in soliciting grey literature because the users often remember that they have some resources that they may share with the rest of the world. Slideshare compels users to contribute before they are able to use other people's contents. The 'stick' approach works whenever the reward surpasses the cost.

Faculty are open to Open Educational Resources (OER) channels such as Merlot because these platforms welcome 'bits and pieces' of work, and not necessarily a complete piece. This seems less critiquing and more geared to teaching, as opposed to channels such as departmental websites, repositories that detonate a scholarly review undertone.

4.6 Factors Influencing Faculty's decision to Disseminate Digital Grey Literature

Based on the literature review and subsequent theories, the conceptual framework presented in chapter two was used as a thematic framework to establish the factors that influenced faculty's choice of tools and methods to use in dissemination of grey literature. In pursuance of this objective, the researcher sought to find out the faculty's perception on the influence of those factors in the context of sharing digital academic grey literature.

4.6.1 Cost Factors

a) Additional Time and Effort

Faculty who have disseminated their works online and seen the real benefits, do not perceive the amount of time and effort required to put the works online as an issue. They

believe it is worth it, or that after initial learning, subsequent learning curve is not complex. The subsequent benefits of placing the works online are perceived to save time later. The faculty believe that once it is online in a digital format and shared, subsequent sharing becomes easier through redirecting and quick access to the works.

> *Not really. Actually I think it is the doing of the work ... or if it is a paper writing and doing research that is the hard part. But sharing, as long as you can ... of course you need to do something that is relevant to I guess to your situation.* ***AL1***

> *The additional time and effort? I think it is worth it. Actually am looking for time, but I've been saying I need to create an online profile.* ***L5***

> *No. It doesn't take much time and effort. In fact I think it's quite the contrary. It probably saves me time. Like it's a one off job and I can get my stuff later.* ***AL3***

Faculty who have not shared their work have the perception that the amount of time and effort it takes does not commensurate the benefits likely to be envisaged. They feel 'robbed'.

> *As faculty I feel 'robbed'. As in all the time spend in preparing this thing. Imagine it takes a lot of time. Like I've set up five pages now. And believe me it takes a whole load of time. Yes. I'd say this is such a factor.* ***AL6***

> *I think once you are aware what happens it should not take much time. It's just finding time. The motivation is there.* ***L6***

> *Yes. Yes it does take much time [to post work] because, you know like for us lecturers we take to prioritize preparing for class and going to teach. You*

know that is what we are paid for. ***L2***

Am in the process of like designing my small web page to share my stuff. But at the moment, it's not really a priority. ***L4***

Faculty perceive that the additional *effort* it takes to codify and store knowledge may not be adequately compensated for. They believe it is without the scope of their core business. This is embedded in the nature of grey literature production. The amount of effort required to 'clean up' the work before it is fit to be put online is a deterrence. This is coupled with the 'slow' reward associated with sharing of the works online. They perceive it is not worth the effort since the requisites for promotion is not pegged on the sharing or visibility of the grey literature, but rather evidence of production of the work. These sentiments are expressed as below:

Of course I could share the thesis. I've always thought of cleaning it but it is such a long time ago. I don't know if it's .... it's like I've to do more before I can think of publishing or putting it anywhere online. ***L4***

This sharing thing is an issue of personal initiative. yeah. of course, it's not something am being paid to do. It's not part of my work. I think that why I haven't really dedicated too much to doing it. ***L6***

Faculty seem to concentrate on their 'core' business of teaching and research. Grey literature is perceived as secondary. From the interviews, the techno savvy young faculty perceive the effort required not to be the issue. But both groups fundamentally agree that the additional time it takes could be gladly given to someone else to do for them. This suggests mediated deposits. Most interviewees also present an alternative view that while the time required is not as much as that taken to produce the work, they still somehow

find it an impediment that would be gladly given to someone else to do for them. This is consistent with the literature findings that argue that faculty would gladly rather have somebody else do the work for them (Carr *et. al*, 2007; Foster & Gibbons, 2005; Harnad, 2006; Kim & Stanton, 2016).

Interestingly, faculty do not perceive one on one sharing (like through e-mail, e-learning) to be difficult, and hence when there is need for sharing, then the sharing platform (e-mail, Moodle) does not seem to impend on the additional time and effort. However, sharing through the scholarly archiving methods such as IRs, subject repositories, departmental web pages is heavily perceived to take much time and effort and probably necessitate a learning of new skills.

Younger faculty perceive the additional time and effort in terms of learning not to be an issue, as they believe they could easily learn the skills to do it, as contrasted to older faculty.

Additional effort is perceived to be the amount of work required to put the already existing grey literature to a form that can be sharable and usable. This is a great impediment to sharing works, with faculty citing a number of reasons from the work being done a long time ago, and hence would need much ‘updating’ before it is made sharable. This is tightly tied to quality, especially in sharing works to a global audience, and hence the amount of time and effort required to put the works to an acceptable quality is seen a great deterrence to faculty. Faculty indicate a preference for other

platforms such as the Open Educational Resources that allow 'piecemeal' works, since that would involve a small component of their work, and the work would be produced in the context of teaching and learning where there is minimal peer criticism.

Concerning mediated deposits, some faculty perceive that it may not be done to their representation. They propose to be given a level of control despite the mediated deposit. None of the interviewed faculty had done a self deposit on the SU-Portal or any other IR. The deposits on SU-Portal were all mediated, and the work to be deposited was sent via simple e-mail to the librarian to 'upload'.

Faculty perceive sharing of grey literature works as a 'low priority' job. They have other tasks that they would rather be doing. Even when the benefit is known and perceived, the motivation to do it is limited. There is no 'business case' for grey literature management. Teaching pays, research pays, but grey literature 'does not pay'.

b) Skills

The findings showed that Faculty who perceive themselves to have higher skills in IT do not cite skill as a key deterrence to sharing of grey literature works.

> *Am an IT person. I can build a website. I can look for someone to host it. Then I share my work there. I think my background makes the learning curve shorter, smaller. [laugh]* ***L5***

> *In fact my question had been that would Strathmore host it? and the other question is that do I want Strathmore to host it. Can't I just create my own website and pay for it. And put on all my professional and academic*

> *experience in work over there. So that over time, you say as years are passing you always do new things, and you tend to forget what you did in your 20s, 30s, it can be counted as an online portfolio. So that if you are looking for or say applying for a research grant for example, you can direct people to that. Or if you are looking for a consulting job, you can direct people to that one. Ideally that is it. That's branding. I think.* ***L4***

> *If it needs very technical skills, I would reconsider. But I don't think this sharing thing requires that much complicated skills. I think its kinda like* e-learning. ***AL6***

> *That one I don't really mind because am so much... am open to learning. am an open person. Am open to learning. I like getting to know new things that are out there. Things that I could do ... differently or I could do better. So anytime I get an opportunity of all you could get to do this by yourself, I would be happy to do it.* ***L3***

On the other hand faculty who perceive themselves to have lower IT skills consider skills as a challenge and readily welcome the idea that if they wanted to share, they would conveniently look for someone with the skills to do the actual posting. Skills parse is therefore not identified strongly as a great deterrence, if the initial motivation to share the work is strong enough.

> *You see. I have to know where go to put this thing on the website. Who is the web designer, who is in charge of what... and most lecturers don't bother about webs. They come to university to teach. So they may not. But if I can know this is the person you gave and pass it on. That's all.* ***SL5***

> *The additional skills I need to learn? Yes that could be an issue. Even to know what it means to share it. I think that may be a problem.* ***SL4***

> *Skills is also a challenge ... but also ... you see the idea of ... .its a challenge.*

> *skills is a challenge. but then since somebody needs to invest in time to get the skills, they are tied together. Somebody to do it for you would be a motivation. because you save time and you could be doing something.* ***L2***

c) Copyright Concerns

Copyright concerns in relationship to grey literature was assessed by the extent to which faculty perceive violation of copyright by sharing their research outputs.

Faculty interviewed generally demonstrated a level of understanding about copyright. However, in relation to grey literature, they seemed unsure about how copyright laws worked with content in digital format. The clarity level is expressed by a number of faculty as follows:

> *I don't think my thesis is copyrighted. But the journal ... the journal will be copyrighted. In fact am not the one who will have to follow it up. It's the person who published it.* ***AL3***

Generally, faculty seemed oblivious of their self-archiving rights. They believed that once a work was published, the copyright was fully relinquished to the publishing body. Consequently, they felt they had no further role in dissemination, as well as any control over the work. Faculty interviewed barely had the preprints of their works and were unaware of the Gold and Green roads to OA.

> *I've read that in one conference, where when you submit in a paper, first they start by making sure you have not submitted it anywhere, they peer review it and select it as one of the papers to appear in the proceedings, you can't submit it anywhere else of course. now they disseminate it in the proceedings. If someone wants to see it, you direct them to the proceedings of the conference.* ***SL5***

> *But I understand that when you go to a conference and the paper is published in the proceedings, you sought of, you can't release it anyhow because you ... am not sure you give up copyright ... you give up rights to the documents... to the publishers? because they become the publishers. Isn't it?* ***L6***

> *You see my dilemma comes with like for example the thesis, I can give to the library. But articles that I publish in journals can I? At least based on what I've read online, especially when you publish with reputable publishers, that whole idea is you relinquish ownership of your works.* ***L5***

> *Coz when am looking for a paper, and may be the university does not have access to that paper, and I need it desperately. I write to the guy and say please* e-mail *to me that paper. I've ever received an* e-mail *like that: the bottom line was that he can't help, coz he's tied by publishers. please go to the following link, and when you click you are required to subscribe.* ***L5***

Some faculty expressed belief that it is the scholarly publishing process that ensured works were truly copyrighted. That only through traditional scholarly publishing would a user be ascertained of protection of their works. Merely putting works online was not considered a sure way of protecting digital works produced.

> *Actually, my concern is that some people may plagiarize it if it is not publicized. That is why the journals have authority. When you publish at least you know that that work is copyrighted. But a thesis... Is a thesis really copyrighted? Am not sure. A whole thesis, unpublished. It is not copyrighted. Because it is not published. So if I put it out there, someone can just take it and obliterate the copyright. Unless it is published. but now if I put my thesis and someone takes it up, and a student from I don't know Moi university or Nairobi copies the whole thing, it is not even copyrighted and I struggled so much to write it, there is nothing I can do. There is no way I can just put out my whole thesis out there in digital form.* ***AL4***

Where there is greater altruism, the effect of fear of works being plagiarized diminishes. Possibly in relation to grey literature, due to its very nature, the end objective would have already been met.

> *I think, if a guy were to like to take the work that i've posted online, well, what end is he seeking. Does he just want to get credit for what he has done or is he going to use it to come up with something that is really going to help society. In the latter case, I don't think I mind. After all even my work is build on other people's works.* ***AL2***

> *mmmm noooo. The copyright doesn't really bother me that much. Because aah you know it would be written copyrighted. People will always violate that. So really something that I really want to put out there, it would have to be at that point where am ok with it. I mean I understand this is Kenya. You know. a movie comes out and its pirated all over the place. you know. So at this point in my life am thinking if I have gotten the benefit of it, you know, if it is in terms of having it properly published . you know doing what is needful. if it's something that should help somebody out there, I don't mind.* ***SL1***

For course notes used in lectures, faculty seemed to express an informal attribution shared at a departmental level. They generally acknowledge works as done by departmental peers and hence copyright infringement is not perceived. This is an interesting simple informal peer attribution probably pegged on the information commons, and anchored on the fact that commercial exploitation of the resources is not envisaged. This was expressed by SL4 as follows:

> *And I believe, even in many universities, there are departmental resources that many faculties use and say this was done by so and you can use it from time to time. The departments just know who did this or that.* ***SL4***

Some faculty did not have a clear understanding of copyright in a digital environment. They felt that their works would be plagiarized if placed online, than it would if it was in print. They felt that in print form, the copyright to their works was respected.

> *I was also saying that somebody can obliterate your name and put his name and erase the copyright, then the work becomes theirs.* ***AL4***

Consistent with the findings on Research Question one, digital grey literature is produced in a context of achieving other goals other than sharing it. As such, faculty were often oblivious of the fine print that related even to their works.

> *Thesis, I don't know those stuff. Is it mine? Its mine and the university or what? I never bothered to read those fine prints. All I know they say something about ownership.* ***AL3***

Some faculty had shared versions of their works without copyright clearance from their publishers. But upon inquest had removed it. One faculty interviewed had experienced this with Business Cases he had written and shared the experience:

> *The one I had written last time. It was actually on the e-learning cite, and then I told them to remove it because I had not gotten permission , I had not signed a certain document. So I had to remove it from the public.* ***SL4***

Joint ownership of grey literature works also posed challenges to faculty on who owned the copyright. This was illustrated with the case of Business Cases that faculty wrote for the university. They did not seem to have a clear understanding on who exactly had what rights over the works.

> ***Interviewer:*** *tell me how you write the cases.*
> ***Respondent:*** *what do you mean.*

Interviewer: *do the cases belong to you?*

Respondent: *yeah. I come interview you then you give me information I write about what you'll be telling me.*

Interviewer: *so the end result is whose property?*

Respondent: *aaaah. i think by virtue of being in Strathmore, they belong to Strathmore. Coz they're the ones giving the resources.*

Respondent: *I think. am not so sure.*

Interviewer: *so they belong to Strathmore?*

Respondent: *but I think. they belong to me. Coz am the one who has authority over them. Am not sure.* ***AL5***

Faculty understanding of copyright issues is very limited, even for their own works. They are limited in knowledge about what constitutes their 'rights'. This is consistent with the literature findings. Gadd *et al*. (2003) surveyed a total of 542 academics spread over 57 countries spread in all subjects areas. Over a third of the respondents did not seem to know who owned the copyright in their own published works.

Faculty are also reluctant to violate the copyright provisions of publishers for fear of subsequent future relations, and if sharing online would mean such an infringement, they will gladly desist (Salo, 2008).

Sharing platforms that relegate the tasks of copyright clearance such as IRs are therefore not likely to fair well in relegating the tasks to faculty. The interviewed faculty did not seem to consider the pre-prints of their published works as a work with an independent life. The role of a third party therefore in seeking copyright clearance is thus deemed

mandatory if faculty are to be encouraged to share works in more digital platforms such as IRs.

d) Plagiarism

Plagiarism is associated as a cost factor from the SET. Here it is envisaged that sharing digital grey literature may predispose the works to greater plagiarism. This is a pertinent factor given the inherent characteristics of grey literature which predisposes this form to limited visibility.

Faculty interviewed who had not shared their works online were more concerned of plagiarism to their works, and indicated that it would hinder their willingness to share digital grey literature. Faculty who had shared their works online were less concerned of plagiarism to their works. Altruism seemed a factor that minimized the fear of plagiarism. The fear of plagiarism is magnified by the limited understanding of the creative commons rights, and copyright violation is envisaged. The great loss envisaged from plagiarism of the faculty work, and the associated costs of 'proving' that the work was yours, is a great deterrence to those who had not shared their digital grey literature. The faculty felt that they would be powerless in such a context.

> *There is nothing I can do. Someone can take my whole thesis and publicize it. For published works, yes. Someone else at least they are taking care of. But the thesis, you see it is my thesis. I haven't, I mean, it is just there. it can be downloaded wholesomely and presented wholesomely in another university. And there nothing I can do. Which I don't think I should encourage people by putting my work out there just like that.* ***AL9***

Faculty who had shared their works were more welcoming to this risk, though they recognized it as such.

> *Well, that happens, it's a risk. But I think may be the benefits may be good enough. At least people will benefit from it. Because even when it is in the library, people still refer to it, and some people still plagiarize it.* ***L5***

> *I've no much concern for plagiarism. Not really. I don't think, and anyway a lot of work on slideshare is . what? Copied! I think you remember the recent bill the stop online piracy . I'd imagine they'd shut down Slideshare. Coz some of the things are put there, are put by people who have not created that work, so when I was uploading my work there, I knew there is a possibility that someone could download and use it to teach in class, or use it to prepare assignment. But I didn't care really.* ***L6***

Some faculty were aware that plagiarism is not limited to the digital availability and though the availability of the work in digital format predisposes it to greater plagiarism, it also makes same easier to detect. They also recognized that works could still be plagiarized even while in print format, and in this case detection would be harder.

Faculty who had shared their works online were more familiar with the concept that work was more easily identifiable in a digital version, and hence more protected, than it was when in print form.

> *I placed my works online and someone took them... won't they be FOUND? (emphatic)* ***AL7***

> *Will they be able to like for example I've know that I have put two of my articles online, if someone plagiarizes those articles ... if they are not found, it means they*

> *are not disseminating their works, which they are not a competitor at all. And if they attempt to disseminate, I know they will be found. So that doesn't bother me.* ***L3***

Faculty who had not shared and were not familiar of this paradox expressed a need for reassurance that their works would not be plagiarized.

> *Are there controls? Because there should be controls. Isn't it. I mean if someone copies and publishes it without recognizing me then I can know that I can protect that fast. Controls so that this work of mine is protected, so that nobody can copy. I would be interested in that.* ***L1***

Consistent with findings with similar studies, fear of plagiarism serves a detterent to sharing works online to faculty who have no experience with sharing works. Those who have shared their works are more comfortable with the knowledge that plagiarism is more easily detectable for works that are already published online (Kim, 2011; Harnad, 2006).

e) Quality

Quality as a factor relates to a potential cost associated with sharing digital works, where the works being shared by the scholar are deemed to be of less quality, possibility having infringed other's works, or having used wrong methodologies or similar aspects that would possibly scandalize the reputation of the scholar.

Most faculty are confident that their digital grey literature works meet scholarly expectations and is not plagiarized. They are therefore not at all shaken to share their works on the basis that their works have plagiarized copyright of other people's works.

This is more so in light of the works that have undergone scrutiny through use of software that detects plagiarism, or some level of peer review. However, most faculty still perceive publication in journals as the best assurance of quality in their works.

Some faculty however, in light of when their works were done, the skills and awareness levels, are in agreement that their works do contain some level of plagiarism. In most cases, this is bundled up with 'quality' as a factor for not sharing, rather than reclusively isolate it as 'plagiarism'. The perception of quality as acceptable is likely to result to subsequent sharing of the work, despite the plagiarism concerns. The perception of quality as unacceptable is likely to result on the works not being shared. However quality encompasses not necessarily the plagiarism, but other aspects of the research work such as methodology, discussion of the findings and at the core, peer review which is perceived to be the 'rubber-stamp' of quality.

> *yes. mmm. I think by the time I was doing that study, there was quite a bit things that we just pick and ... of course you paraphrase, but may be you may not have done a good job in getting it done well.* ***L4***

> *nooo. I actually have never thought too much of it that way because aaaa in the ways that I do my writings, am conscious of the notion of plagiarism. So I try as much as possible to be very explicit about my citations. And the synthesis of my work. so should anybody accuse me of plagiarism then it would have been you know just a small aspect that I may have overlooked. It not one of those aah… deliberate things. so in essence it is something that is defensible in that sense. that it is just some unavoidable the similarity index is this high its unavoidable.* ***SL2***

> *I've no plagiarism or quality concerns over my works. No. for the simple reason that the few little works that I have done, were checked for plagiarism. heavily checked.* ***AL9***

> *I do. at least may be that is why I have not put my thesis online because right now the similarity index on turn it in is 23% and I want to reduce it so ... I don't feel so confident putting it online.****L5***

Peer assessment is still considered a very important part in quality assurance of grey literature works. Where there is no stringent peer review, faculty are likely to be reluctant to share the works online in a multiplicity of platforms.

> *Then it is like taking that has passed the test of quality. quality test. and therefore you'd want it to the general public. But we fear putting them [business cases] in the departmental website. coz these are things we actually create and we've not given them for peer assessment so that we can say nobody will criticize it if it is ok to the general public. People would ... generally me too,.. I would be sceptical putting it in my website. But once it is good, if it pleases my eyes I can put it.* ***SL3***

> *I'll share my works after its published. I guess then it would have more quality. Because it has been sifted through the minds of many intellectuals. When it is still in a raw form, it is just the of course it has been sifted, it was supervised, I presented it before a panel of many people, but at the end of the day, when it is published, then I would have more confidence to have it online. It would do more good after it has been published.* ***AL4***

For greater willingness in dissemination of digital grey literature, it is important that some mechanisms be put in place for quality assurance of the works. This may be at a school level where the works may go through a form of peer assessment. In the absence

of quality controls, grey literature produced by faculty is unlikely to be shared to a global audience, but rather be limited to one on one sharing and use for educational purposes.

f) Loss of Knowledge Power

While loss of knowledge power has been cited as a chief concern in knowledge sharing in commercial settings, in the academic industry it does not seem to hold much weight, since sharing of scholarly works is a norm and prerequisite for establishment in the field. None of the interviewees expressed loss of knowledge power as a reason they would not share their works, but most of them preferred that they would first of all publish in the 'formal' channels first before disseminating the grey literature. For instance, in the case of a thesis, there would be a tendency to publish all the possible papers from it before considering giving it out for dissemination.

Loss of knowledge power is therefore not strongly considered a reason, but it does seem to have an effect on the submission of forms of digital grey literature, since placing one's work online is not perceived by faculty to be a form of 'publishing'.

> *No. I don't perceive loss of knowledge power as an issue. You know the reason why? Even if I restricted so that I don't lose, people can have other means of getting the same.* ***AL6***

> *My knowledge power? I will not lose my knowledge power. Because even before I share, I will go to the details to make sure what am sharing is high quality. may be am gaining more. and the other thing is you get recognitions and people might also ask you more questions and challenge you and you end up learning more. Just refusing to share so that you don't lose knowledge power itself is not a reason enough because someone can also get that*

> *knowledge from elsewhere, may be even where I got. So I wouldn't fear that.* ***L1***

In the academic profession, it is recognized that sharing is part of teaching, and a requisite. Faculty therefore do not see the need for 'hoarding' the knowledge to provide a niche advantage.

> *That is a big problem amongst lecturers. Among some lecturing community. But you see so long as am teaching it to class, its gone. because I lose that power immediately i go to class. that is the logic behind teaching. I mean once you've parted with knowledge the students know it. and if they know it, what about your colleague? So it doesn't come to play as such* ***SL5***

> *I don't have any of that fear. I mean in terms of my approach to knowledge is that if it can't be shared then it can't be used. Then it can't be used, then it's not worth having. you know. that is not to say that there are certain things that you have to speak out everything. That there are certain things for example if a I have a brilliant business idea then I have to keep it to myself until I actualize it.* ***SL4***

The only situation when it does seem to hold true is when the idea being worked on is very new and there is need to for credit as the originator of the work. This would only seem then to make faculty hold back to the work until they publish it.

> *Unless it's a work in progress, where you want to perfect it, publish it and get all credit for being the originator of that idea.* ***L6***

g) Criticism

Fear of criticism was cited by faculty as a factor that would deter them to share digital academic grey literature. This is anticipated since criticism would be a dent on professionalism and how other authorities in the field would perceive them. Sharing the works online would provide a global audience and hence expose the gaffe to a bigger audience, and possibly dent their professional image.

> *You see, even teaching. In class even when you go for a workshop and you want to make a presentation, you see you're confined to your audience, and the mistakes you make there will end there somehow. Or its even known that this guy gave us a lousy lecture, it will not go so far. But if you were to goof out there, and then share with another person who will see what you did that was bad.* ***SL4***

> **Respondent:** *I think the first thing is fear of criticism. You know of course I might be too open to the world.*
> ***Interviewer:*** *criticism from whom?*
> **Respondent:** *from somebody, somebody can say ... this model ... seriously ... I guess a professor. This thing is not you know... do you even know what you are doing?*
> **Respondent:** *I think it is possible for somebody to do this is my view.. I mean, and I did the project in a very short period. I did it well enough to obtain a masters' degree. I mean it was in partial fulfilment. but even I myself am not very convinced that it is ready for use .. so to speak. I think so it's interesting. It's like a conflict. On one side I think that it is something that can be improved upon, so it would be good to share it with people. But on the other hand I fear that I think the idea is ultimately, do I think it is worthy of sharing. If I think it is, then I share and its criticized. Which is almost ironic. coz I managed to argue it to an audience of professors and they said fine. But I wasn't satisfied myself. I know the*

> *model can be better. I think for me the issue is really to be convinced first that this thing is worthy of sharing. then I can. Even on* e-mail*. I just don't share it with anyone.* ***AL1***

A decision to share existing digital grey literature works comes with a perceived additional task of 'cleaning' the works. This is perceived as an additional work for which faculty may not have time for since the perceived results of doing this work is not instantaneous.

> *Well the main thing is that it depends on what. You know when doing the thesis at the time I was not really thinking of that. Sometimes you find there are some things which you may have done that at that point you want to ask yourself . Really I could have done better. Sometimes you feel bad. other times you look at it and say well very well. The idea is to get that one and struggle and get some more so that if anyone somebody was to access that they can see some progression.****SL5***

Faculty also felt that they did not have time to rework some of their earlier works to meet a quality that they would wish to be identified with. As such they were reluctant to share these works. For faculty that have more publications to share, this fear does not prevent them from the initial sharing, since there is opportunity for viewing progression of works.

> *Sometimes you feel bad. Other times you look at it and say well very well. the idea is to get that one and struggle and get some more so that if anyone somebody was to access that they can see some progression. Maybe this guy was still a 'kurut' [an amateur]. Now he is growing, he's growing, growing. now he is becoming a pro.* ***L7***

A form of peer assessment is deemed sufficient to debar the effect of fear of criticism as a mitigating factor in digital grey literature works sharing.

> *Just internally. Or peer assessment. Then they will be much more confident to share it. And so although there are not published works or work that can be indexed somewhere, the best mechanism for encouraging their sharing is some quality check. In fact there quite a number of things that we use [in house]. But we do not want to share them coz we don't know whether it will be acceptable to the general public.* ***SL5***

> *So papers written by this Dr. X are subjected to six seven reviews, and when I read it I was like ... you know... and by the time they think of sending the work, I should have over checked the work. Yes, I mind my online image.* ***AL7***

Grey literature works are often done in a context that does not necessarily suggest initial sharing of the works. The fear of criticism to the works is perceived to negatively affect the motivation to share one's work. This is in context to the teaching role of faculty that predisposes them to be 'masters' of their work, and hence criticism of their works by colleagues and others by opening the works to a global audience is a big hindrance to sharing grey literature works. Salo (2008) contends that faculty would gladly keep away from such criticism that would portray them negatively to their online communities.

Though a number of grey literature works undergo a form of minimal peer review (theses, working papers, preprints) faculty still consider publishing to be the gold standard that eliminates the fear of criticism (Crow, 2002; Harnad, 2006; Lynch, 2003).

This is a great factor that deters deposits of grey literature online in an OA context. Unless there are more publications by the author that have been done and published in reputable journals, grey literature alone will not guarantee the faculty that they are getting any worthwile venture in sharing. While it would be possible to redo the work before sharing, this comes at the cost of time which most faculty express to be short of.

h) Predatory Publishers

One faculty who had shared their works online enlisted an experience of an emerging cost that would be termed as 'Predatory Publishers'. Through automated bots that search the IRs, the faculty received an e-mail with the offer from the publisher to publish the work. After doing some preliminary searches about the publisher, she found out that this was a fraudulent publisher and they solicited money to perform the same endeavour. With Faculty's desire to publish, this is seen as an emerging cost. The sharing of digital works predisposes faculty to predatory publishers and fraudsters.

> *I got a funny* e-mail *from people who said they were publishers who turned out to be fraudsters. I think there is a trade where someone searches for academic names then they* e-mail *them. and check. That was simply a page set up a few hours before. As in the name they had was very close to a certain publisher name. And anyone who tells you to pay without papers. .. Those are the signs. They were saying were a Publishing company we want to publish your thesis to a book. Our rate are as follows. We request you to* e-mail*, print and sent the work to us. And we will charge you blah blah blah* ***AL9***

Beale (2012) compares the advent of predatory publishers with the rise of e-mail spam with the invention of e-mail. The desire for OA publishing models for research is driving a parallel unethical and criminal model of publishing. Beale (2015) maintains an online

list of predatory publishers, and by 2013, had listed up to 126 publishers, mostly from India. He also enlists criteria for identifying such publishers. The predatory publishers target academics especially from developing countries with a desperate need to have their works published. They approach them asking them for up to 1,800USD to publish their works. Some predatory publishers plagiarize works of scholars and go to extend of listing faculty members to non-existent editorial boards.

Similar predatory publishers, with an obvious target of authors from developing countries are reported by Jalalian and Mahboobi (2014) of 'American' Journals based in Asia, and with no single American publishing in them. They offer 'rapid' peer review with publishing of the articles within two weeks provided author fees is given. Other predatory publishers are even more elusive. These publishers target journals listed by the Thomson Reuters (ISI) print only journals with no website. They design a fake website for the journal clearly stating the indexing factor.

In a surprising twist, new levels of sham journals now enter the cybercrime level. Butler (2013) reports a case of cybercrime where two real reputable European Journals webpages were counterfeited. The hijackers steal the identity of the real publisher and solicit author fees.

This study therefore identifies predatory publishers as a great cost of going OA to faculty, particularly in the context of grey literature given that the authors are likely to get invitations to publish their grey literature, including thesis.

i) Business Case

Consistent with the SET, faculty perceive research as a slow-return investment activity. In a private university, the faculty are paid to teach, foremost. Dissemination of grey literature and its related activities are perceived to 'infringe' on the time of the faculty, and they do not seem to perceive it as giving in much short term value. In their words, it does not make business sense.

> *I am a [student] mentor and am supposed to be doing research at the same time, and I have my personal life .. It goes on. So you sort of prioritize. You have to distribute the time resource across all things. Coz right now teaching is what is putting food on my table, I dedicate a lot on that. Research is not putting food in my table to be honest. But it is something I want to do because am an academic am interested in developing expertise in this area. In my field. And its like a long term project. Write papers now and reap gradually over time. I wish to get to a time where research can put food on my table so to speak. So right now if I have ten hours and am asked, invest those ten hours in teaching will give you Kshs. 200,000. If you invest 10 hrs in research will give you 5k. Automatically I will teach. However, if I can teach the ten hours worth in 7 hours, then I will take the 3 hours and use it in research. so I kill both birds with one stone. So I still get the Kshs. 200,000. and then get to put something into that long term investment.* ***L6***

> *The economics ... what do you call it. ... the business case is not there. I struggle to see ... yes, I know there is that part that am excited about something, go shout it on top of mountain, but I think my mountain is my students, my peers, I hit my mountain there with this thing you call grey literature. [Laugh] . I hit the top there. I don't see the hullabaloo over this whole online thing.* ***AL7***

The perceived costs of sharing are carefully weighed by faculty. Despite the benefits touted from sharing of works online through some forms of self archiving, faculty do not immediately seem to perceive this benefit. They are keen on a faster-returning kind of investment and sharing digital grey literature does not seem to promise much towards this role. Selling the repository would therefore have to appeal with a benefit that is perceived to take less cost inputs. Salo (2008) gives a sombre overview of how IRs and the librarian roles closely resemble the 'Innkeeper' at a 'Roach' Motel with content going in and never coming out, and with overated and never delivered promises to faculty who do not even seem interested. Foster and Gibbons (2005) present a greater understanding of faculty and their needs: faculty need to teach, research, read, share and keep up with their fields. They complain of overwork, resist clerical responsibility and resent any additional activity that cuts to their research and writing time. The observation of no business case in sharing of grey literature works therefore resonates with their expectations and reality.

4.6.2 Benefits

Benefit factors are drawn from the SET and seek to find out factors that would positively influence sharing of grey literature. As discussed earlier, actors in a social exchange tend to perform those acts that increase their benefit, and minimize their costs. Towards this end, the researcher identified financial rewards, professional recognition, publicity and citations and altruism as factors that would positively influence sharing of digital grey literature. Below are the findings and discussions for each corresponding factor:

a) Financial Rewards

Financially rewarding faculty for their contributions to online grey literature portals, would influence faculty to share their grey literature, but only if the rewards are perceived to commensurate to the efforts the faculty have put in.

> *Yes. A financial reward would influence my decision to put my digital grey literature works out there. But it depends. The amount matters. If they give me like ten thousand, and I can make more than that doing something else, then I'd rather do that something else than concentrate on this.* ***L7***

> *I would be motivated very much. actually even now I've got things here that i thought if someone would say lets share, I'd give. I believe it would influence me. I would say it matters.* ***SL5***

> *Let me tell you, there was a time this university was giving Kshs. 5,000 for every published work. Who bothered? Who cared? That if you publish some work you can be given 5k or 10k. They changed recently and said its 150k. Everybody is now inquiring. Even me. I wanted some work to be done so that I get access to the 150k. It makes a difference. Instead of teaching, I would rather this.* ***SL2***

> *Yes but does the benefit of aah of this reward this reward does it outweigh the cost of going through the trouble and hassle and whatever of getting it in* ***L1***

One faculty interviewed felt that financial rewards would not be an influence in sharing of digital grey literature works.

> *Honestly for me no. it is a I think what motivates me is something that I can see. in one way or another this is going to benefit the society, for me*

> *that is enough motivation. I don't think I will be motivated if they say there is some amount of cash. in fact they exist, even there is a reward for publishing for a journals. But I don't think it has motivated me to go the extra mile. So it is I don't know. I don't think I will be motivated because there is reward.* ***AL7***

Bock and Kim (2001) in their study on breaking on benefits in information sharing found out that knowledge sharing is negatively related to expected rewards. They established that rewards discourage the formation of positive attitudes towards knowledge sharing, similar to the pay-performance debate. Worse still, rewards tended t o create a punitive effect because they are manipulative like outright punishment. Not receiving a reward feels like outright punishment. Further, rewards were perceived to break off relations so that for every person who won, countless others felt that they had lost. It encourages competition for limited incentives and contributes negatively to an organizational culture that encourages trust. In relation to grey literature and from the interview transcripts, the outcomes seems to resonate in the same vein. This view is also upheld by Bartol and Srivatsa (2002) who contend that rewards could work in team based rewards that offer company-wide incentives such as profit sharing, gain sharing and employee stock options. However, in informal interactions, the key enables is trust and the role of rewards would therefore be indirect. Bock *et al*. (2005) found similar results of a negative correlation of expected extrinsic benefits to knowledge sharing.

b) Professional Recognition

Professional recognition was perceived as a benefit to be derived from sharing works online. Faculty interviewed felt that there was value in professional recognition as it

accorded funding opportunities, and the overall sense of their perception as authorities. However, faculty acknowledged that professional recognition came as a by-product of the work, and for it to occur, the work must first of all be of quality.

> *Yes, I want people to know me professionally. And actually that is the motivation in writing and sharing. But the works must of course be of quality.* ***SL3***

> *I think professional recognition comes as a by product of the work. But then unless you share the works you don't get it.* ***L4***

> *I actually never thought of it that much. but I think in essence because you know as we are looking up to the higher levels of the ladder, that is an unnecessary evil so to say. That in order for you to move up to be recognized to the next stage your work has to be out there. You see so it's not its sort of cyclical for me. that were it possible for me to get to the next level without necessarily having to think of putting myself out there I would be happy to do that. that I don't .. but I have to put it so that then I can get the recognition.* ***AL9***

> *I think it is an area that people have a lot of interest in. and especially in regard to research because I did something on outsourcing. And even right now, I still get student's who want to do that area, aah. Yeah. obviously professional recognition is also good esp. when you come to think about eventually you'd want to go present wherever . so if you're already known. It becomes easier to maybe get a paper accepted, even take consultancy positions somewhere.* ***L2***

However, faculty point out that professional recognition may not come from digital grey literature alone. It has to be a combined effort largely stemming from works published by faculty in proper peer reviewed journals.

> *Being published in the right journals will improve your professional recognition. That would be my target. I don't think online improves the true target am going for.* ***AL8***

> *I think let me explain a little bit. when I become Prof. X, an acclaimed author researcher, consultant, in this age we are, like there is a guy called Robert Cooper in the area of Product Development. Now he stopped even publishing. He started his own consulting firm, his own think tank where he writes things and puts them there. if you look for Cooper 2011 2012 in product development journals, you won't find him. not because he is not writing. I think he has reached a point where, he says, I've already gained the prestige I want so now I can disseminate the work openly everywhere. People will read it. They are people who say if its not published in the best journals, I won't bother. And there are people who think that way. 1st, 2nd tier journals.* ***L3***

Publicity is construed as a by-product of publishing. It is not possible to attain it without publishing. Faculty do not generally perceive publicity as achievable and attainable from sharing grey literature works. Rather, they believe it is only attainable by publishing in proper peer reviewed journals. Selling open sharing platforms such as IRs as avenues for improved publicity is therefore not likely to achieve much with Scholars (Crow, 2002; Salo, 2008).

c) Publicity and Citations

Faculty perceived publicity and citation as a great motivator to sharing their digital online works. In their words, it made business sense since with increased publicity, the works

were likely to be read and cited. Citation was expressed as a positive factor that would attract more benefits to the faculty.

> *That is a business case. yes. am seeing that can fall in my CV you just don't write I have a thesis. You say it has been cited . Now that's credibility.* ***L3***

> *It's like the same thing. You know. That people would be looking at ok how many times has she been cited so that we can decide whether she deserves to be a professor or not. You know as opposed to this is what that I did and I think it was worthwhile work. It is out there and people are reading it whether it is one person or a thousand people. So it is sort of that necessarily evil.* ***SL5***

> *Well, of course as an academic you want to be able to more or less assess whether you are doing well or you are doing poorly. And that is a very good way of doing it. Whereby if people cite your work, and use it, at least it means they appreciate your line of thought.* ***L8***

> *And also it adds value to me, like when am, like now am applying for my Ph.D, so am able to put links on my CV, put links in my statement of purpose or whatever. those people to access. So I don't know, but it works for me.* ***AL6***

Some faculty expressed did not perceive citation as core in the absence of the value of who was doing the citation.

> *Of course it would matter who is citing me. [Laugh]. Let's be honest.* ***AL9***

Faculty had limited understanding of the copyright provisions that they would use to increase citations to their works, and acknowledged that low citations could arise from publishing works that are inaccessible to the rest of your professional peers that are likely

to cite you. One senior lecturer lamented that even he could not access his own published works.

> *I've got four papers that I've been published. But you can't access them [sigh]. They are accessible online. It's an online journal. But you pay for it. They are one in Romania then another one in Korea. So those ones cannot be accessed anywhere unless they pay for it. That means I get fewer citations. I am not happy about this situation. Plus they pay for it and I don't get anything.* ***SL3***

The citation advantage directly relates to what faculty look for in publishing. Faculty acknowledged that even their grey literature works being cited meant that they were producing quality works (preprints, theses, working papers). This is consistent with the findings in literature that generally OA articles received greater citation than their non-OA articles in a similar journals, with citation rates higher by up to 132%. (Eysenbach, 2006; Gargouri *et al*., 2010; Norris *et al*., 2008). The citation benefit is therefore an aspect that can be leveraged upon to encourage faculty to embrace more digital grey literature sharing opportunities.

d) Altruism

Altruism is operationalized as satisfaction in helping others through knowledge sharing. This was found to be a great factor in sharing digital grey literature. Where there is greater altruism, sharing was most likely to be positively viewed, despite other negating costs.

> *Honestly for me no. it is a I think what motivates me is something that I can see. in one way or another this is going to benefit the society, for me that is enough motivation. you know if you look at this guys what are they called*

open office. They created the whole . it's not called open office. Open source. it is called open source. software that you can use to do many things, then guys collaborate and improve on it. so it serves a big good purposes and many people who use who would otherwise not been able to afford windows. to afford the Microsoft office. I think that is the kind of thing that would excite me. In fact I think that is even why am here in Strathmore . You know I even thought, I could probably be working in another place with more cash, working fewer hours, perhaps having less responsibilities, but I thought if you are in class there standing, talking to 80 students, those are 80 guys you are influencing. ***AL8***

I would share, for the sake of sharing. you see I teach the area of IS and one argument i usually express very strongly the whole idea of information you put data into a computer it processes you get info. If that info remains in this stand alone comp, its only useful to me. The moment I connect this computer to another and another and allow them to access the info in the computer it gains value. now the moment you put it in the biggest network ever, the internet, its value becomes exponential. as in it becomes invaluable. and that's the point of creating information. I think that is my whole understanding of . ***L5***

aah but if somebody else could benefit from part of it . why not. That in our lives I think in some ways knowledge is really knowledge once it is shared and it is made use pass it on to somebody else, and they use it, then it is wonderful. You know and I think maybe that is really I mean may be that is largely my approach to my work. ***SL3***

Altruism, according to Harnad (2006) features an element of the golden-rule reciprocation. When it comes to author-impact, altruism then becomes a matter of pure self interest. Kim (2011) in studying factors that influenced faculty to self archive found

altruism to be a significant factor that affected faculty self-archiving practices and intentions. Faculty felt that they had a bigger obligation beyond self to society and beyond in sharing of their works online. That self archiving assisted in obtaining more cutting-edge research and contact with more researchers. Others found that they explicitly felt satisfied in assisting others through self archiving of their works. It therefore stands that intrinsically, altruism is a great motivator to sharing of digital works online. This view is equally held by Kankanhalli *et al*. (2005).

4.6.3 Contextual Factors

Contextual factors are derived from the SC Theory. Trust, Norms and Experience are perceived as an important component in information sharing. Using this precinct the researcher sought to find out how the organizational culture and interrelationships affected digital grey literature.

To answer this question, interviewees were asked questions 7(i-l) or 8(i-l) appropriately. The researcher sought to find out the contextual factors that influenced information sharing based on precepts of the SC Theory of trust, norm and experience.

Faculty interviewed were largely unaware of subject repositories in their disciplines. The disciplines of practice they were familiar with were Professional Societies which they belonged to, mostly for examination purposes. Faculty expressed more interest in this, given that they felt they would receive more professional publicity and reputation from these avenues.

> *yes. we can say there are annual seminars, workshopss, forums in our discipline. And yes, I like sharing here because professional recognition is much felt amongst peers in such forums. Definitely* ***SL3.***

The study established also that faculty interviewed had a positive experience with strong networks within the organization. This, they felt was positive and encouraged them to share their work, though it would not mean that if they were elsewhere they would not share their works.

To trust the level of trust, faculty were asked their perceptions and relationships with librarians. The relationship was found to be largely positive, and faculty expressed that their information needs had been met at the library. They expressed that library staff often exceeded their expectations. They expressed confidence that the library had the competence and capability to handle their digital grey literature works and place it online without fearing violations.

> *My interaction with librarians before I came to SU was not very close. But when I came here it has improved. I think it depends on the culture of the library and also the friendliness of the people. I have developed a rapport here and am encouraged to visit the library for assistance.*

> *My relationship with the library where I was before I came here was very impersonal but very very professional. I was partly because ok. I was in institution that was very huge. The library was huge. Massive. I loved my library by the way. I didn't know the librarian. Because everything was very clear. So I didn't need to get to know the librarians. Any time if there was a big question that I had to find out.. then it would be easy* e-mail *and there was almost immediate correspondence. so am not writing an* e-mail *and waiting*

> *ten hours. am writing an* e-mail *waiting a couple of minutes. there was somebody there. it was impersonal in that sense, yet I think aah . fulfilling when I needed to take advantage of it. I don't know if am making sense, but that was a great impersonal relationship.*

Faculty, however, laid emphasis on the fact that their perceptions of the competence of the librarian had influence on the grey literature. If they perceived the librarians to be incompetent, they would not want any further engagement with them, neither would they be willing to participate in additional activities.

> *Let me tell you. For example the other day I went to the library ok. and there was the person who was serving at the front. and I asked her where I can find entrepreneurship books. She had no idea. and. then she says.. ooh then she checks aah then she says you'll find it on this floor. So I went and am checking so am reading the stuff that is written and its says entrepreneurship it says I think let me just give an example so it's says I think L65 to L67 and it says that here. So I walk along that shelf and there is nothing [emphasis] only to find it 3 shelves further. And am thinking my … my and am thinking in my mind . you'll forgive me and in my mind I thought this is very very stupid. So when I face such things am thinking I do not want this incompetent person handling my stuff. Am telling you. [laugh]. I am serious. You are asking me to be honest. Right**? SL2***

> *It depends. because I mean. like the Research Services offices here. no I would not. I mean. again for me it boils down to the one on one interactions and what I perceive to be the benefits of it, which in some ways I guess you know may be the way the university is young.. so I don't quite get a sense of ... then what would be the benefit. **SL3***

In the context of SC the relationships that do not exude professionalism therefore reduce the trust that faculty have on library, and with this relationship, meditated management of digital grey literature presents complications.

4.7 Measures to Facilitate Better Management of Digital Grey Literature

In order to answer this research question, the researcher asked the respondents directly (See Appendix 4 question 7h and 8q) as well as inferred from responses to the answers given in research questions 1 to 4. What follows is the critical evaluation of the responses with their implications.

a) Grey literature is an elusive output that is not sometimes clear even to the producers of the work.

> *It [Grey literature]is not even something that before this interview I don't think I have given it active thought like I should really share this thing, can I put it on the net al7*

Implication: Grey literature forms that the library intends to curate in various formats must be explicitly identified beforehand. This implies that the policy for management of digital grey literature must enlist the forms of grey literature it intends to capture, the production point and the strategy for recruitment.

b) With ubiquity in computers, grey literature is being mostly produced in digital form and faculty have a digital version of some form of the final output.

Implication: The library has to have mechanisms of managing digital grey literature forms that are produced. Literature suggests best practices to include deposits in the IRs and subject repositories as a management solution.

c) In most instances, faculty indicated that they had copies of their works in flash disks and e-mail. Faculty cited that they used these mainly as a backup. Some faculty used dedicated online storage services to offer additional back up services for their grey literature such as cloud based storage services. (Google Drive, DropBox).

Implication: Faculty are using existing technology to store and back up their work. They perceive this as sufficient. Marketing the IR as a cloud backup may therefore not achieve much adoption rates given that faculty are already contented with the services they are getting from other providers.

d) Their digital grey literature is produced in formats that were originally used to create the documents. Popular formats cited are Word for word processors, Excel for spreadsheets, PowerPoint for presentations, SPSS for data and PDF for final version of works for onward archiving and transmission.

Implication: The library has to rethink the formats that it uses in the IR for long-term data preservation. The formats have to be viable for future retrieval while bearing in mind formats that are usable to end users needs.

e) Faculty indicated that they had shared (in one way or another) most of the digital grey literature that they had produced. This includes theses and dissertations, research hour (Brown Paper) Presentations, Course notes, teaching cases, class projects, seminar papers, reflective portfolios, curricular, conference papers, working papers, keynote addresses, and academic manuals. Faculty had not shared data, pre-prints and software code because they perceived this to be impartial outputs of the final product.

Implication: The library has to carefully plan about dataset curation, software code curation and sharing of preprints. The preprints present themselves again in copyright issues that allow for depositing a version of the author paper. Faculty awareness is therefore important if this data formats are to be stored in the long-term by the library.

f) Faculty indicated that they had shared their grey literature in three important contexts: With the official disseminating agency (e.g. Library for thesis, Conference organizers for thesis and commissioning agents for working papers). Faculty share their works with colleagues based on trust. This is done on one-one-basis to known beneficiaries using simple techniques such as e-mail and e-learning, which faculty perceive to be adequate. Lastly faculty share their grey literature with students based on interest and superior knowledge power given that no criticism is anticipated. They perceive this to be more than sufficient in terms of sharing grey literature.

Implication: Faculty do not perceive a global audience in production, use and sharing of their digital grey literature. It will call for the library to raise awareness of the value of sharing grey literature to a far wider context. Grey literature is often produced in a context geared towards meeting other information needs, and the need for its global visibility is never quite envisaged by the producers of the work. This already portends an initial challenge in marketing the IR as channel for global visibility given that the original intention of the work is long done by the time the library is doing the organization and dissemination of the work.

g) The most popular channels used by faculty to disseminate their digital grey literature are i) The official disseminating channel for the work (such as the soft copy to graduate school in compact discs and library for thesis, or final copy of work to the conference convenor or the consulting agent). ii) E-mail. E-mail was most preferred due to ease of subsequent sharing by simply 'forwarding' to the recipient. iii) Cloud backup. Faculty expressed they had used cloud back-up services to store their works online, especially when the files were huge. This included Google Drive (Doc) and Drop Box. iv) Moodle (e-learning platform) had been widely used by faculty to share notes and teaching resources and was found simple and appropriate for a targeted audience, and also part of their duty workflow.

Implication: Faculty perceive the existing technology to be sufficient for dissemination of their grey literature works. E-mail and cloud based services are particularly appreciated by faculty due to increased storage provisions. E-learning platforms was employed by faculty to share their grey literature works with students, and was considered adequate and appropriate. As such, marketing the IR as a form of cloud based storage will only be replicating a service that is already being satisfactorily offered by other providers.

h) Faculty had further used the institutional intranet, departmental websites, the IR, slide-share, and OER platforms to share their works. All deposits at the IR and the departmental websites were mediated by a third party.

Implication: Sharing technology beyond the intrinsic e-mail and e-learning platforms faces some form resistance as it is not a natural choice. Mostly it emerges

long after the primary benefit of the grey literature work has been achieved, and could require additional time, effort, skills which faculty express to be short of.

i) Faculty are mostly oblivious of popular subject repositories in their discipline, and have not used them in sharing their digital grey literature. They were not familiar with EconPapers, Social Science Research Network (SSRN) and Arxiv for the Computer Science and IT disciplines. They were more familiar with commercial sharing sites such as SlideShare. Some faculty are familiar with Open Educational Resources portals such as Merlot, and welcomed them as appropriate for sharing of digital grey literature forms since they accepted small bits of works (like animations, presentations) and with least criticism though they had no shared their works yet. Faculty interviewed are familiar with Research Gate, but none of them had deposited their works there. They admitted that they had retrieved resources from these channels.

Implication: Faculty are not familiar with subject repositories in their disciplines, though they have already used them to retrieve their work. This implies already there is a level of use of the subject repositories. The library therefore has a role to actively sensitize faculty on the existence of the subject repositories in their disciplines.

j) Faculty perceive the additional time and effort required to share grey literature to be a great deterrence to sharing. They concede that grey literature works often needs additional ‘cleaning’ before it is suitable for sharing online. They express that additional time and effort is a great deterrence to sharing their works.

Implication: Library will actively need a liaison librarian that does the ‘clerical’ works of pursuing the grey literature from faculty and doing the deposits. The

mediated deposits are going to stay, and expecting faculty to do the deposits in IR is going to remain a pipedream if repositories are to be populated. This has implications on staffing of the IR department given that this is a task that has to be undertaken in perpetuity.

k) Faculty do not perceive the lack of skills on how to conduct online sharing to be a great deterrence to sharing their grey literature. If the motivation for sharing exists, learning the skill is something that they are willing to do.

Implication: If faculty get the motivation to share their grey literature in say subject, institutional or departmental websites, they would be interested in learning the basics of how this is conducted, though they may still require that somebody else does it for them.

l) Faculty understanding of copyright issues is very limited, even for their own works. They are limited in knowledge about what constitutes their 'rights'. Faculty have no idea about non-exclusive copyright provisions for their works, neither do they have an idea of the Creative Commons licenses. They are however reluctant to violate the copyright provisions of publishers for fear of subsequent future relations, and if sharing online would mean such an infringement, they will gladly desist.

Implication: Sharing platforms that relegate the tasks of copyright clearance such as IRs to the faculty are likely to fail. The liaison librarian remains with a critical role of seeking publisher copyright clearances on behalf of faculty.

m) Faculty who have not shared their works online are deterred by fear that their works may be plagiarized. Those who have shared their works are more comfortable with

the knowledge that plagiarism is more easily detectable for works that are already published online

Implication: In sharing digital grey literature in online platforms such as IRs, the library has a role of assuring faculty that plagiarism is easier to detect for works in online formats, and the timestamps serve to authenticate which works were placed online earlier.

n) Most faculty are confident that their digital grey literature works meet scholarly expectations and are not plagiarized. They are therefore not at all shaken to share their works on the basis that their works have plagiarized copyright of other people's works. However, some forms of their grey literature were not intended for 'global' audience and require additional work to place them in a format that would be suitable. This is perceived as a deterrence related to additional time and effort construct. Peer assessment is still considered critical in grey literature works, and faculty perceive this to be only attainable through publishing in reputable journals. This construct was further expressed as fear of criticism from a bigger global audience for the works deposited, and hence potential dent on the professional image.

Implication: There is need to establish internal peer assessments to assure faculty that their works is of quality before the deposits are done at the IR. While this is attained at an additional cost, it could be reinforced by additional internal reward system such as considerations of works published in the repository as a criteria for inhouse academic rewards on the tenure of the employee.

o) Predatory Publishers was established as a new cost factor to faculty. This was already experienced by faculty who had deposited their works in the IR, and got an e-mail

from fraud publishers purporting to be interested in publishing the grey literature works that they had posted online. This is critical with grey literature, given that the predatory publishers target unpublished content in IRs.

Implication: Sharing digital works in IRs comes with the additional burden of filtering predatory publishers. This is an emerging theme that faculty must be sensitized of and the library must keep updated on the trends of this emerging risk so as to protect the interests of faculty.

p) Financially rewarding faculty for their contributions to online grey literature portals, would influence faculty to share their grey literature, but only if the rewards are perceived to commensurate to the efforts the faculty have put in. Else, they would eventually rip in to the SC factors helping to create an atmosphere of minimum trust negative competition.

Implication: Financial rewards for contributions to repositories could take the form of winning teams (say departments with highest deposits) for the benefit to be of value to the institution. Individual benefits may have detrimental effects to grey literature deposits.

q) Professional recognition, publicity and citations is perceived as a possible benefit of sharing works to a global audience, and it excites faculty. Faculty however contend that this may not be achieved through the IR, but rather in subject repositories that give better professional expertise recognition.

Implication: Libraries have concentrated mostly on their role in IRs. Libraries must admit the limitations that repositories offer, and work in partnership with subject repositories by mediating deposits to other forums that achieve this task best such as

subject repositories and Google Scholar that provides metrics for faculty. These are benefits that faculty envisage, and by working in collaboration with additional networks, libraries add value to the IR.

r) Faculty interviewed had a positive experience with strong networks within the organization. This, they felt was positive and encouraged them to share their work (such as notes, teaching cases with colleagues) though it would not mean that if they were elsewhere they would not share their works. Faculty appreciate this positive organizational culture. Faculty also enjoy a positive relationship with librarians and felt they could entrust them with their digital grey literature works for copyright clearance, deposits etc.

Implication: The positive SC that exists at Strathmore University is a conducive base for better digital grey literature management practices. The institutional culture and norms promote an atmosphere that would facilitate sharing.

Based on this findings, the researcher proposes a framework for improving digital grey literature management at SU.

4.7 Framework for Grey Literature Management

Based on the discussions in the preceding section, it is clear that the management of digital grey literature necessitates the library as a key actant. Leaving the digital grey literature management tasks to the producers of the work (faculty) is bound to produce haphazard results particularly in relation to dissemination and long-term curation of the task. In an open-access context, leaving this task to the producers of the work is likely to

result in less populated institutional and subject repositories. The framework proposed therefore rebounds the task to the library, with new considerations in undertaking the task.

This framework is based on the classical role of the library as outlined by International Federation of Library Associations and Institutions (IFLA) Statement of Rights and Intellectual Freedom. The library has as Acquisition, Organization and Dissemination of information. It expands on the actants prominent at each level and the active role that the library has to partake.

Framework for Improvement of Management of Digital Grey Literature

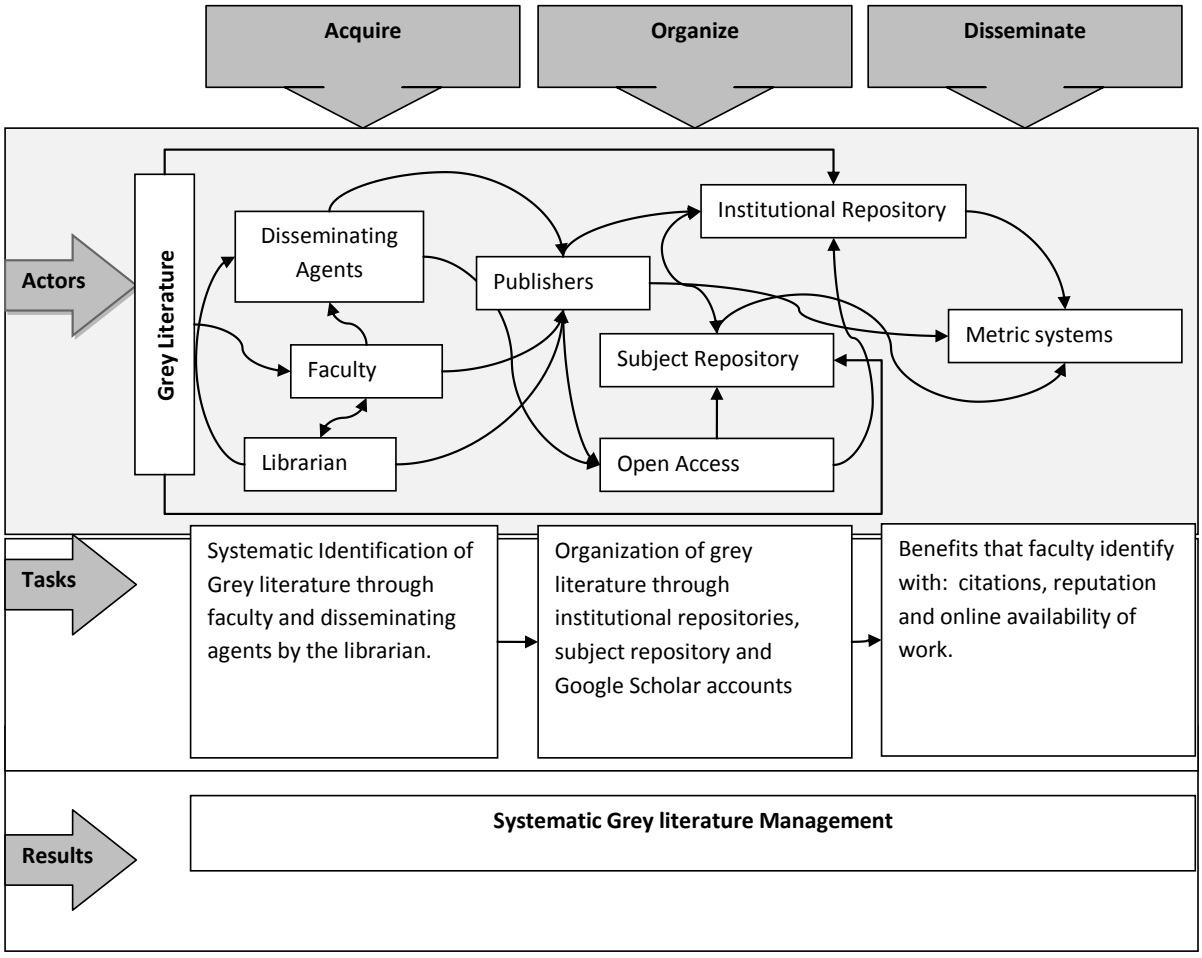

Figure 4.1: Framework for Grey Literature Management

A policy framework based on ANT is proposed and presented in Figure 4.1. The various actants are mapped to create a visual reminder of the expectations each. The framework is based on the IFLA (1999) Declaration that mandates libraries to acquire, organize and disseminate information. Actants that are in play from the acquisition of grey literature to the dissemination are mapped.

Grey Literature is the first actant. It is a product of faculty and therefore interacts with it. The needs of faculty have therefore to be at the core of the model. As presented from

findings, faculty disseminate their grey literature often with the official disseminating agency that commissioned the work. This is therefore the first most reliable way to retrieve the grey literature. The library must identify the grey literature forms that it is interested in curating before hand.

Faculty often publish a version of their the grey literature works. This introduces publishers as actants who come with new conditions. The new conditions introduce copyright barriers on the forms and formats of the works that may be available online from the original grey literature. The publishers are under pressure of the OA movement which such pressure often giving non-exclusive rights to the creator of the work. In organizing the work, librarians must bear this in mind so that the copyright provisions are not violated. Faculty are keen not to breach copyright provision. These activities form part of the organization dimension.

Findings indicate that faculty are interested in professional recognition, publicity and citations as a key benefit of sharing grey literature to global audiences. The IR arguably is not in a position to offer this benefit. Rather, it contributes to finding of the full text of the item. This research therefore proposes that librarians work with faculty to leverage the benefits that faculty immediately identify with. Metric systems, such as the one provided by the Google Scholar take minimal time to create and faculty can immediately see the works that they have published, the metrics of usage and the institutional affiliations. This is what faculty want. Librarians, working backwards, can then use these results to feed the institutional repositories with the full text of the articles, since Google Scholar

only indexes. Additionally, the works of the faculty should be fed to the subject repositories. The impact of this three-fold task is that, while it connotes additional tasks to the librarian, it brings in more business case to the IR. It offers a case for the IR as an important feed not only to the national and international repositories, but also contributes to the OA movement by making the work available to the end users. This denotes a win-win situation for faculty as content contributors, the end users and presents a case for the repository's existence in the institution.

The ultimate result of this management is grey literature that is well organized and retrievable to the future, and satisfied faculty who are able to reap the benefit of professional recognition and citations from their grey literature works. Given the immediate benefits from the metric systems, faculty are more enthusiastic to give their grey literature works as they immediately see the relationship between open access and citations.

4.8 Conclusion

This chapter has given the findings to the research questions raised in Chapter one. It has also analysed and presented discussions on the most critical findings. Based on the discussions, a framework has been developed to improve the management of digital grey literature and expounded. The next chapter presents a summary, conclusion and recommendations for the entire thesis.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of this thesis along with some recommendations for both practice and future research in the subject of digital grey literature management. First, a brief review of the research aims, design and scope is provided. Next is an overview of the main research findings as related to the research questions. The implications of this study for practice are then (theoretically and in practice) are discussed. The limitations of the study are then presented, and finally, possible future research areas are explored

The main motivation for conducting this research on faculty practices to digital grey literature management is based on the researcher's observation and subsequent literature review of literature that points out to minimal grey literature deposits by faculty to IRs despite the benefits that they portend. While there exists a clear understanding on the limits of placing journal articles in repositories, it was not clear why grey literature resources, which are largely unique and not constrained with copyright limitations typical of journal articles are not populating the repositories. From experience of running a digital repository, training and marketing for the repository had already been done, yet the submissions remained meagre and mostly solicited. Why were faculty not eager to place their digital grey literature at the repository? What other forums could they possibly be using that were more luring? What could be done to rectify this, given that grey literature works represents an important segment in the information landscape and

uniquely defines an institution's collections? Following an extensive literature review, the researcher sought to understand the faculty and their information sharing behaviour. This is considered a prerequisite to understanding their information sharing behaviour in relation to grey literature.

Subsequently, the researcher crafted the following objectives for the study:

i) Identify digital grey literature produced by faculty at SU.
ii) Assess information organization practices accorded to the digital grey literature by faculty at SU.
iii) Assess information dissemination practices accorded to the digital grey literature by faculty at SU
iv) Understand motivations for choice of dissemination practices for the grey literature produced.
v) Suggest a framework for improving digital grey literature management.

Based on these objectives, the following research questions were crafted:

i) What forms of digital academic grey literature do faculty produce?
ii) How do faculty organize the grey literature they produce?
iii) How do faculty disseminate the digital grey literature they produce?
iv) What factors influence faculty's decision to disseminate digital grey literature?
v) What measures can be put in place to facilitate better management of digital grey literature?

A case study of SU was appropriate given that the institution had frequently ranked top in the Webometrics survey of universities in Kenya and Africa. This means that it had a level of web presence measured by research visibility, and implicitly therefore, it means that it produces digital grey literature. The institution also ran an IR.

Based on the objectives to be attained, an interpretive paradigm was adopted. The case study methodology was used as a research method. Data was collected using semi-structured interviews. These were then transcribed and thematic analysis undertaken. The research design has been found appropriate and has provided rich insights on what digital grey literature faculty produce, how they share it, with whom they share it with and what factors could influence them to share. This subsequently has implications theoretically and in practice, which is presented in subsequent sections.

5.2 Summary of Findings

Based on the research questions drawn, this section gives main summary of the findings drawn.

5.1.1 Forms of Digital Grey Literature

First and foremost the researcher sought to find out the forms of grey literature, and digital grey literature that are produced by faculty. The detailed discussions are presented in section 4.

It was found out that faculty had produced the following forms of grey literature: workshop presentations and papers, theses, research hour (brown paper) presentations,

course notes, teaching cases, class projects, seminar papers, software programs, research data, curricula, project reports, conference papers, working papers, key note addresses, preprints, teaching portfolios, and academic manuals. This is presented in Chapter 4, Table 4.4. Faculty further clarified that all these documents were in digital formats, with majority of them having been produced in the computer era.

Faculty spontaneous response to what forms of grey literature they had produced were initially directed to 'traditional scholarly' outputs such as thesis. It is only after initial probing that faculty explored the additional documents they had produced that could be classified as grey literature. Grey literature therefore remains an elusive genre to identify even to the producers of the work.

5.1.2 Organization of Digital Grey Literature

The researcher sought to find out how faculty organize the digital grey literature that they produce. The detailed discussion is presented in section 4.1.2 and summarized below:

Faculty organize their digital grey literature in folders stored at their desktops/laptops. Their digital grey literature is in formats that were originally used to create the documents. Popular formats cited are Word for word processors, Excel for spreadsheets, PowerPoint for presentations, SPSS for data. PDF for final version of works. Other files are in specialized formats such as programming codes. After completion of work, most faculty back up their works on e-mail and online storage services. (Google Drive, DropBox).

Faculty seem to use existing technology to organize their existing digital grey literature. This is defined from the creation, storage and back up their works based on their level of expertise. As such selling the IR traditionally as an avenue for backup and storage may not send a strong appeal to the repository users. They consider the existing organization and backup mechanisms as sufficient and appreciate that e-mail providers are increasing the amounts of online storage accorded users unlike the past where online storage was minimized and hence inadequate. Cloud backup services are also enticing to faculty.

5.1.3 Dissemination of Digital Grey Literature

To answer this question, the researcher sought to identify the forms of digital grey literature that had been shared, with whom they had been shared with and the channels utilized in the sharing. The results of the discussion are presented in section 4.4.1 to 4.4.3 and summarized below.

It was established that faculty had shared their theses and dissertations, research hour (Brown Paper) Presentations, Course notes, teaching cases, class projects, seminar papers, reflective portfolios, curricular, conference papers, working papers, keynote addresses, and academic manuals. Faculty had not shared their data, software code and pre-prints. The reason was inferred to that faculty perceived these as incomplete outputs that are often part of the bigger project. (journals, projects, thesis, dissertations).

Faculty share their works with official disseminating agencies based on obligation, with colleagues based on trust, with perceived beneficiaries based on altruism and with

students based on responsibility. The official disseminating agencies include libraries, post-graduate schools, conference organizers and consultants for seminars and working papers. Sharing with colleagues was based on the perceived benefit the colleague would derive from, future relationships and where criticism and unfair use of work was not anticipated. Sharing with students is based on the desire to disseminate the knowledge and passion of the faculty for the item under study. Faculty often perceive this to be the end of their responsibility in sharing of digital grey literature.

Faculty have used a number of channels to disseminate their digital grey literature. The most popular channels used by faculty include e-mail and the e-learning platform, and the university intranet. Faculty also cited use of Google Drive and DropBox to share their resources. Web sources (that give global visibility) used by faculty in include departmental websites, the SU-Portal (IR), Slide Share. Faculty seem to use sharing technology that is natural to their day to day work. They do not perceive a global audience for their grey literature works immediately. Works shared on the global visibility were largely commissioned by a third party entity. All deposits to the IR were commissioned, and so were the departmental website contents. Therefore, digital grey literature, as an elusive output presents a scenario where active soliciting for global visibility must be actively sought.

5.1.4 Faculty Influencing Faculty's Decision to Disseminate Digital Grey Literature

Factors that influence faculty to disseminate their works can be categorized into three: Cost factors, benefit factors and contextual factors.

The cost factors were found to influence dissemination of grey literature as follows:

a) Additional Time and Effort

Faculty who have not shared their work have the perception that the amount of time and effort it takes does not commensurate the benefits likely to be envisaged. 'They feel robbed'.

Faculty who have shared their works online and seen the real benefits, do not perceive the amount of time and effort required to put the works online as an issue. They believe it is worth it, or that after initial learning, subsequent learning curve is not complex. The subsequent benefits of placing the works online are perceived to save time later. The faculty believe that once it is online in a digital format and shared, subsequent sharing becomes easier through redirecting and quick access to the works.

Faculty perceive that the additional effort it takes to codify and store knowledge may not be adequately compensated for. They believe it is without the scope of their core business. This is embedded in the nature of grey literature production. The amount of effort required to 'clean up' the work before it is fit to be put online is deterrence. This is coupled with the 'slow' reward associated with sharing of the works online. They

perceive it is not worth the effort since the requisites for promotion is not pegged on the sharing or visibility of the grey literature, but rather evidence of production of the work.

Both groups fundamentally agree that the additional time it takes could be gladly given to someone else to do for them, as it is not part of their 'core business'. This suggests mediated deposits. Interestingly, faculty do not perceive one on one sharing (like through e-mail, e-learning) to be difficult, and hence when there is need for sharing, then the sharing platform (e-mail, Moodle) does not seem to impend on the additional time and effort. However, sharing through the scholarly archiving methods such as IRs, subject repositories, departmental web pages is heavily perceived to take much time and effort and probably necessitate a learning of new skills.

Additional effort is perceived to be the amount of work required to put the already existing grey literature to a form that can be sharable and usable. This is a great impediment to sharing works, with faculty citing a number of reasons from the work being done a long time ago, and hence would need much 'updating' before it is made sharable. This is tightly tied to quality, especially in sharing works to a global audience, and hence the amount of time and effort required to put the works to an acceptable quality is seen a great deterrence to faculty. Faculty indicate a preference for other platforms such as the Open Educational Resources that allow 'piecemeal' works, since that would involve a small component of their work, and the work would be produced in the context of teaching and learning where there is minimal peer criticism.

b) Skills

The findings showed that Faculty who perceive themselves to have higher skills in IT do not cite skill as a key deterrence to sharing of grey literature works.

On the other hand faculty who perceive themselves to have lower IT skills consider skills as a challenge and readily welcome the idea that if they wanted to share, they would conveniently look for someone with the skills to do the actual posting. Skills parse is therefore not identified strongly as a great deterrence, if the initial motivation to share the work is strong enough.

c) Copyright Concerns

Faculty understanding of copyright issues is very limited, even for their own works. They are limited in knowledge about what constitutes their 'rights'. Faculty are not familiar with the Green and Gold road to OA. They were oblivious of the Creative Commons rights. They do not seem to be aware of self-archiving rights.

Faculty are also reluctant to violate the copyright provisions of publishers for fear of subsequent future relations, and if sharing online would mean such an infringement, they will gladly desist. Sharing platforms that relegate the tasks of copyright clearance such as IRs are therefore not likely to fair well in relegating the tasks to faculty. The interviewed faculty did not seem to consider the pre-prints of their published works as a work with an independent life. The role of a third party therefore in seeking copyright clearance is thus

deemed mandatory if faculty are to be encouraged to share works in more digital platforms such as IRs.

d) Plagiarism Concerns

Faculty interviewed who had not shared their works online were more concerned of plagiarism to their works, and indicated that it would hinder their willingness to share digital grey literature. Faculty who had shared their works online were less concerned of plagiarism to their works. Altruism seemed a factor that minimized the fear of plagiarism. The fear of plagiarism is magnified by the limited understanding of the creative commons rights, and copyright violation is envisaged. The great loss envisaged from plagiarism of the faculty work, and the associated costs of 'proving' that the work was yours, is a great deterrence to those who had not shared their digital grey literature. The faculty felt that they would be powerless in such a context.

Faculty who had shared their works were more welcoming to this risk, though they recognized it as such. Some faculty were aware that plagiarism is not limited to the digital availability and though the availability of the work in digital format predisposes it to greater plagiarism, it also makes same easier to detect. They also recognized that works could still be plagiarized even while in print format, and in this case detection would be harder.

Faculty who had not shared and were not familiar of this paradox expressed a need for reassurance that their works would not be plagiarized. Fear of plagiarism serves a

deterrent to sharing works online to faculty who have no experience with sharing works. Those who have shared their works are more comfortable with the knowledge that plagiarism is more easily detectable for works that are already published online.

e) Quality Concerns

Quality as a factor relates to a potential cost associated with sharing digital works, where the works being shared by the scholar are deemed to be of less quality, possibility having infringed other's works, or having used wrong methodologies or similar aspects that would possibly scandalize the reputation of the scholar.

Most faculty are confident that their digital grey literature works meet scholarly expectations and is not plagiarized. They are therefore not at all shaken to share their works on the basis that their works have plagiarized copyright of other people's works. This is more so in light of the works that have undergone scrutiny through use of software that detects plagiarism, or some level of peer review. However, most faculty still perceive publication in journals as the best assurance of quality in their works.

Some faculty however, in light of when their works were done, the skills and awareness levels, are in agreement that their works do contain some level of plagiarism. In most cases, this is bundled up with 'quality' as a factor for not sharing, rather than reclusively isolate it as 'plagiarism'. The perception of quality as acceptable is likely to result to subsequent sharing of the work, despite the plagiarism concerns. The perception of quality as unacceptable is likely to result on the works not being shared. However quality

encompasses not necessarily the plagiarism, but other aspects of the research work such as methodology, discussion of the findings and at the core, peer review which is perceived to be the 'rubber-stamp' of quality.

Peer assessment is still considered a very important part in quality assurance of grey literature works. Where there is no stringent peer review, faculty are likely to be reluctant to share the works online in a multiplicity of platforms.

For greater willingness in dissemination of digital grey literature, it is important that some mechanisms be put in place for quality assurance of the works. This may be at a school level where the works may go through a form of peer assessment. In the absence of quality controls, grey literature produced by faculty is unlikely to be shared to a global audience, but rather be limited to one on one sharing and use for educational purposes.

f) Loss of Knowledge Power

While loss of knowledge power has been cited as a chief concern in knowledge sharing in commercial settings, in the academic industry it does not seem to hold much weight, since sharing of scholarly works is a norm and prerequisite for establishment in the field. None of the interviewees expressed loss of knowledge power as a reason they would not share their works, but most of them preferred that they would first of all publish in the 'formal' channels first before disseminating the grey literature. For instance, in the case of a thesis, there would be a tendency to publish all the possible papers from it before considering giving it out for dissemination.

Loss of knowledge power is therefore not strongly considered a reason, but it does seem to have an effect on the submission of forms of digital grey literature, since placing one's work online is not perceived by faculty to be a form of 'publishing'.

In the academic profession, it is recognized that sharing is part of teaching, and a requisite. Faculty therefore do not see the need for 'hoarding' the knowledge to provide a niche advantage. The only situation when it does seem to hold true is when the idea being worked on is very new and there is need to for credit as the originator of the work. This would only seem then to make faculty hold back to the work until they publish it.

g) Criticism Concerns

Fear of criticism was cited by faculty as a factor that would deter them to share digital academic grey literature. This is anticipated since criticism would be a dent on professionalism and how other authorities in the field would perceive them. Sharing the works online would provide a global audience and hence expose the gaffe to a bigger audience, and possibly dent their professional image.

A decision to share existing digital grey literature works comes with a perceived additional task of 'cleaning' the works. This is perceived as an additional work for which faculty may not have time for since the perceived results of doing this work is not instantaneous.

Faculty also felt that they did not have time to rework some of their earlier works to meet a quality that they would wish to be identified with. As such they were reluctant to share these works. For faculty that have more publications to share, this fear does not prevent them from the initial sharing, since there is opportunity for viewing progression of works. A form of peer assessment is deemed sufficient to debar the effect of fear of criticism as a mitigating factor in digital grey literature works sharing.

Grey literature works are often done in a context that does not necessarily suggest initial sharing of the works. The fear of criticism to the works is perceived to negatively affect the motivation to share one's work. This is in context to the teaching role of faculty that predisposes them to be 'masters' of their work, and hence criticism of their works by colleagues and others by opening the works to a global audience is a big hindrance to sharing grey literature works.

Though a number of grey literature works undergo a form of minimal peer review (theses, working papers, preprints) faculty still consider publishing to be the gold standard that eliminates the fear of criticism. This is a great factor that deters deposits of grey literature online in an OA context. Unless there are more publications by the author that have been done and published in reputable journals, grey literature alone will not guarantee the faculty that they are getting any worthwhile venture in sharing. While it would be possible to redo the work before sharing, this comes at the cost of time which most faculty express to be short of.

h) Predatory Publishers

Predatory publishers, through automated bots, target IRs that share grey literature, promising the faculty that they would be published, at a cost. This was reported as a true cost by a faculty who had shared their works online in the SU-Portal IR. Sharing of digital works predisposes faculty to predatory publishers and fraudsters, a cost that has not previously been established in literature.

The predatory publishers target the OA publishing models for research, with upto 126 predatory publishers listed by 2013, and advancing to new levels of cybercrime where reputable journals are counterfeited through stolen identity. Subsequently, they solicit publishing fees from faculty desperate to publish.

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This study therefore identifies predatory publishers as a great cost of going OA to faculty, particularly in the context of grey literature given that the authors are likely to get invitations to publish their grey literature, including thesis, and conference papers.

With Faculty's desire to publish, this is seen as an emerging cost. The sharing of digital works predisposes faculty to predatory publishers and fraudsters.

i) Business Case

Consistent with the SET, faculty perceive research as an activity with a slow-return on investment. In a private university, the faculty are paid to teach, foremost. and given additional mandatory roles such as student mentorship. Dissemination of grey literature

and its related activities are perceived to ‘infringe’ on the time of the faculty, and they do not seem to perceive it as giving in much short term value. In their words, it does not make business sense. It does not bring ‘food to the table’. It does not sell. It has not ‘business case’.

The Benefit factors were found to be as follows:

a) Financial Rewards

Financially rewarding faculty for their contributions to online grey literature portals, would influence faculty to share their grey literature, but only if the rewards are perceived to commensurate to the efforts the faculty have put in. If the reward does not commensurate the perceived rewards, faculty will actually be dissuaded. Therefore, it seems financial rewards eventually has a negative effect on the sharing digital grey literature works.

Financial rewards actually eventually dissuade formation of positive attitudes towards knowledge sharing. They create a punitive effect because they are outrightly manipulative. Not receiving the award feels like a punishment. They also tend to break off relations by emphasizing a win-lose scenario.

b) Professional Recognition

Professional recognition was perceived as a benefit to be derived from sharing works online. Faculty interviewed felt that there was value in professional recognition as it accorded funding opportunities, and the overall sense of their perception as authorities.

However, faculty acknowledged that professional recognition came as a by-product of the work, and for it to occur, the work must first of all be of quality.

However, faculty point out that professional recognition may not come from digital grey literature alone. Publicity is construed as a by-product of publishing. It has to be a combined effort largely stemming from works published by faculty in proper peer reviewed journals.

It is not possible to attain it without publishing. Faculty do not generally perceive publicity as achievable and attainable from sharing grey literature works. Rather, they believe it is only attainable by publishing in proper peer reviewed journals. Selling open sharing platforms such as IRs as avenues for improved publicity is therefore not likely to achieve much with scholars

c) Publicity and Citations :

Faculty perceived publicity and citation as a great motivator to sharing their digital online works. In their words, it made business sense since with increased publicity, the works were likely to be read and cited. Citation was expressed as a positive factor that would attract more benefits to the faculty though some faculty did not perceive citation as core in the absence of the value of who was doing the citation.

Faculty had limited understanding of the copyright provisions that they would use to increase citations to their works, and acknowledged that low citations could arise from publishing works that are inaccessible to the rest of your professional peers that are likely to cite you. One senior lecturer lamented that even he could not access his own published works.

The citation advantage directly relates to what faculty look for in publishing. Faculty acknowledged that even their grey literature works being cited meant that they were producing quality works (preprints, theses, working papers). This is consistent with the findings in literature that generally OA articles received greater citation than their closed counterparts.

d) Altruism

Altruism is operationalized as satisfaction in helping others through knowledge sharing. This was found to be a great factor in sharing digital grey literature. Where there is greater altruism, sharing was most likely to be positively viewed, despite other negating costs.

Altruism, according features an element of the golden-rule reciprocation. When it comes to author-impact, altruism then becomes a matter of pure self interest. Faculty who felt that they had a bigger obligation beyond self to society were likely to share no matter other attributes. Others found that they explicitly felt satisfied in assisting others through

self archiving of their works. It therefore stands that intrinsically, altruism is a great motivator to sharing of digital works online.

5.1.5 Measures to Facilitate Better Management of Digital Grey Literature

The critical factor that can be leveraged upon to improve grey literature management is the benefit that faculty envisage from sharing their works to a wider audience. Faculty envisage professional recognition, publicity and citations. Faculty fear to encounter a number of costs in sharing grey literature notably additional time, effort and skills and violation of copyright provisions. Faculty also have concerns with quality which can be mitigated by internal peer review assessments before the work is placed in the repository.

Based on ANT, various actants in grey literature management are identified and their interrelationships that must be borne in mind during acquisition, organization and dissemination of information. The framework lays out the key outcome of each stage of the process and is presented and discussed in Figure 4.1 in chapter 4.

5.2 Conclusion

The purpose of this study was to identify management practices accorded to digital grey literature by faculty, and their underlying motivations, with a view of improving its management in an OA context.

The study found out that faculty produce a variety of digital grey literature such as: workshop presentations and papers, theses, research hour (brown paper) presentations,

course notes, teaching cases, class projects, seminar papers, software programs, research data, curricula, project reports, conference papers, working papers, key note addresses, preprints, teaching portfolios, and academic manuals. All these were born in digital formats. It was further established that though faculty had produced all these outputs, the immediate output they could identify as 'grey literature' was thesis and dissertations. This means that grey literature remains an elusive output, even to the creators of the work and implies that for proper management of grey literature, the outputs worth long-term curation have to be predetermined, be anticipated and actively solicited. The library must create a surveillance mechanism to anticipate these works and actively solicit for them for the creators of the work. It is recommended that this be explicitly identified in the IR Policy.

The study found out that faculty had shared all the digital grey literature they had produced except for research data, software code and pre-prints. Faculty perceived these outputs as part of another output. (journal articles, projects, thesis). It was further established that faculty had shared the digital grey literature with official disseminating agencies based on obligation, with colleagues based on trust, with perceived beneficiaries based on altruism and with students based on responsibility. The official disseminating agencies include libraries, post-graduate schools, conference organizers and consultants for seminars and working papers. Sharing with colleagues was based on the perceived benefits the colleague would derive from, future relationships and where criticism and unfair use of work was not anticipated. Sharing with students is based on the desire to disseminate the knowledge and passion of the faculty for the item under study. Faculty

often perceived this to be the end of their responsibility in sharing of digital grey literature.

Faculty have used a number of channels to disseminate their digital grey literature. The most popular channels used by faculty include e-mail and the e-learning platform, and the university intranet. Faculty also cited use of Google Drive and DropBox to share their resources. Web sources (that give global visibility) used by faculty in include departmental websites, the SU-Portal (IR), Slide Share. Faculty seem to use sharing technology that is natural to their day to day work. They do not perceive a global audience for their grey literature works immediately. Works shared on the global visibility were largely commissioned by a third party entity. All deposits to the IR were commissioned, and so were the departmental website contents. These findings point out to the fact that digital grey literature remains an elusive output and presents a scenario where active soliciting for global visibility must be actively sought. Faculty do not directly perceive a global audience for the digital grey literature. In the context that this work has to be shared to a larger audience than anticipated, perceptions of faculty must be borne in mind and additional costs due to them duly considered. The library has a role to disseminate the grey literature to the global audience and cannot directly expect this task to be completed by faculty by themselves.

The research sought to understand what would motivate or demotivate faculty to share their digital grey literature to a wider global audience. Factors identified from the literature review and conceptual framework were used to interrogate faculty. It was found

out that the cost factors dissuaded faculty from sharing their works to a wider audience. The additional time and effort required by faculty to codify and post work was found to be a deterrence.

Faculty were unaware of copyright provisions for their grey literature works and some were not sure who owned the copyright of the work, and what that subsequently inferred. The faculty interviewed were not familiar with the creative commons licenses. Faculty perceived additional skills required before depositing works to a global audience a deterrence that would further infringe on their limited time. They preferred that the task be undertaken by an assistant. Faculty did not negatively perceive the quality of their work to be a factor that would deter them from sharing, but expressed their concern that some of their grey literature works would need some form of reworking before being suitable for sharing to a global audience. Faculty did not perceive loss of knowledge power to negatively influence their decision to share. However, they contended that if there were new findings, they would first publish it before sharing it as grey literature. Faculty perceived negative criticism of their grey literature works with mixed reactions with faculty with more experience and publications least worried about criticism, while faculty with less experience were concerned with criticism that could emerge from their work. A new cost was identified as predatory publishers from faculty who had shared their works. They were approached by these publishers requesting to publish their works for a fee.

On the benefit factors, faculty expressed that financial rewards would only influence them to share their digital grey literature if the reward was worth the effort. Otherwise they contended that financial rewards parse did not motivate them to share their grey literature to a global audience. Faculty cited professional recognition as a factor that would motivate them to share their works to a global audience. However, they pointed out that such professional recognition is likely to come from subject repositories where subject experts are present, rather than an IR. Faculty noted that publicity and citations would motivate them to share their works to global audience, they however contented that they did not expect much publicity and citation from grey literature works. Altruism, which is an intrinsic benefit was cited as factor that would influence the faculty to share their works.

On contextual factors, faculty perceived SU to have a positive culture that motivates open communication flows and hence a culture of sharing generally exists. They expressed that they had shared class notes with new faculty requiring to teach a unit, and had used the intranet and e-learning platforms to freely share works with colleagues. Relational trust was also identified as a critical issue for knowledge sharing, with faculty expressing that they generally trusted the library staff to be competent and knowledgeable, and hence felt that they would be in a position to give them their digital grey literature to place it for global visibility on their behalf.

Based on these findings the researcher modified the theoretical frameworks identified for study in chapter two, and also designed a new framework for improvement of digital grey literature. These are presented in the next section.

5.3 Recommendations

Arising from the study, the following theoretical and practical recommendations are drawn forth:

5.3.1 Theoretical Implications

The theoretical implication of this study reside in identification of an emerging actant in the grey literature sharing networks: Predatory Publishers. Predatory publishers present themselves as an actant in the ANT framework. Predatory publishers target the OA content that has not yet been published, and digital grey literature presents a perfect opportunity. It is important from that the ANT framework maps out the characteristic of this actant, and effect that they have on the network of scholarly publishing, given that they lure their victims with promise of rapid peer review and a great citation factor. Based on this, the new actant is mapped out and presented in Figure 5.1.

a) Modified ANT framework

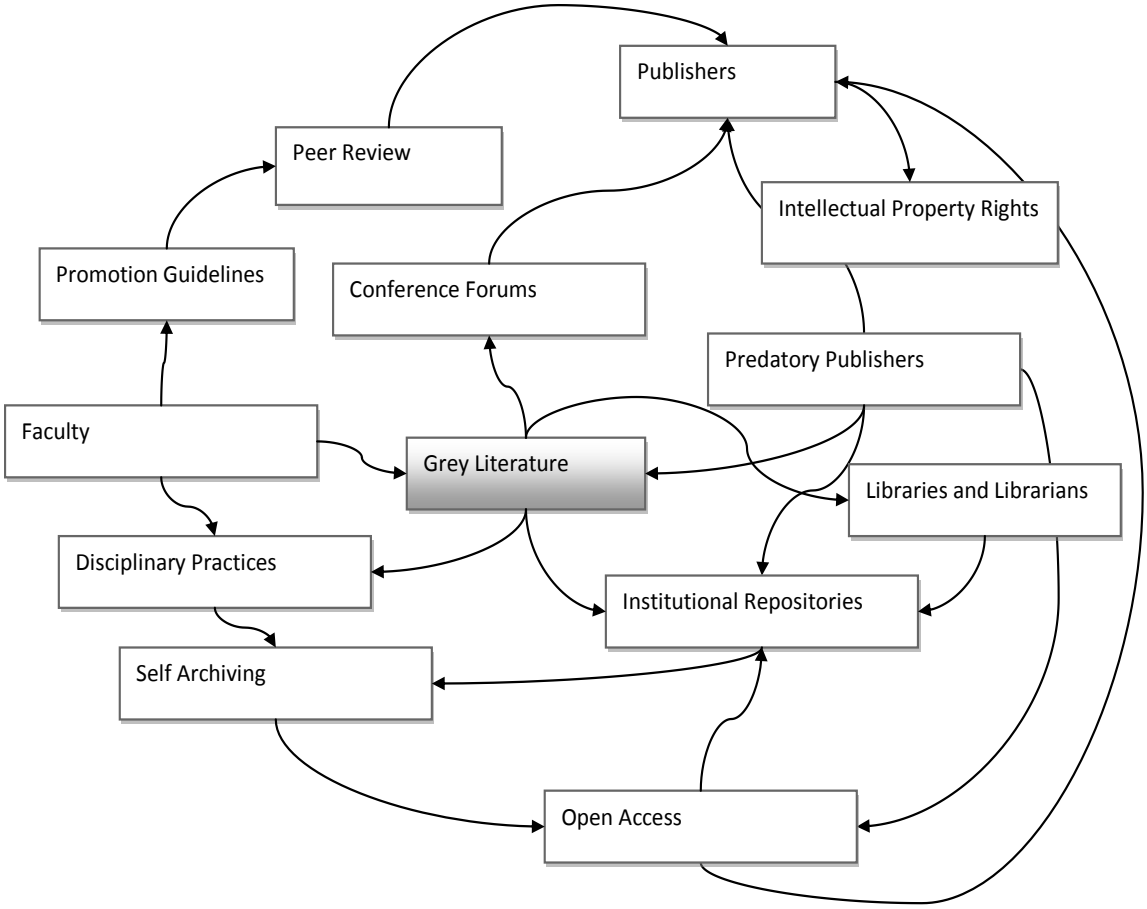

Figure 5.1: Modified Model of Actants in Grey Literature

On SET, Predatory Publishers are construed as an emergent Cost Factor. The cost of publishing with predatory publishers is far-fold from financially being 'robbed' to losing reputation. Predatory publishers, using the bots to crawl through the contacts provided by researchers, present a new cost to faculty who are already overwhelmed with the burden of understanding the scholarly publishing process.

The modified cost factors are therefore presented figure 5.2:

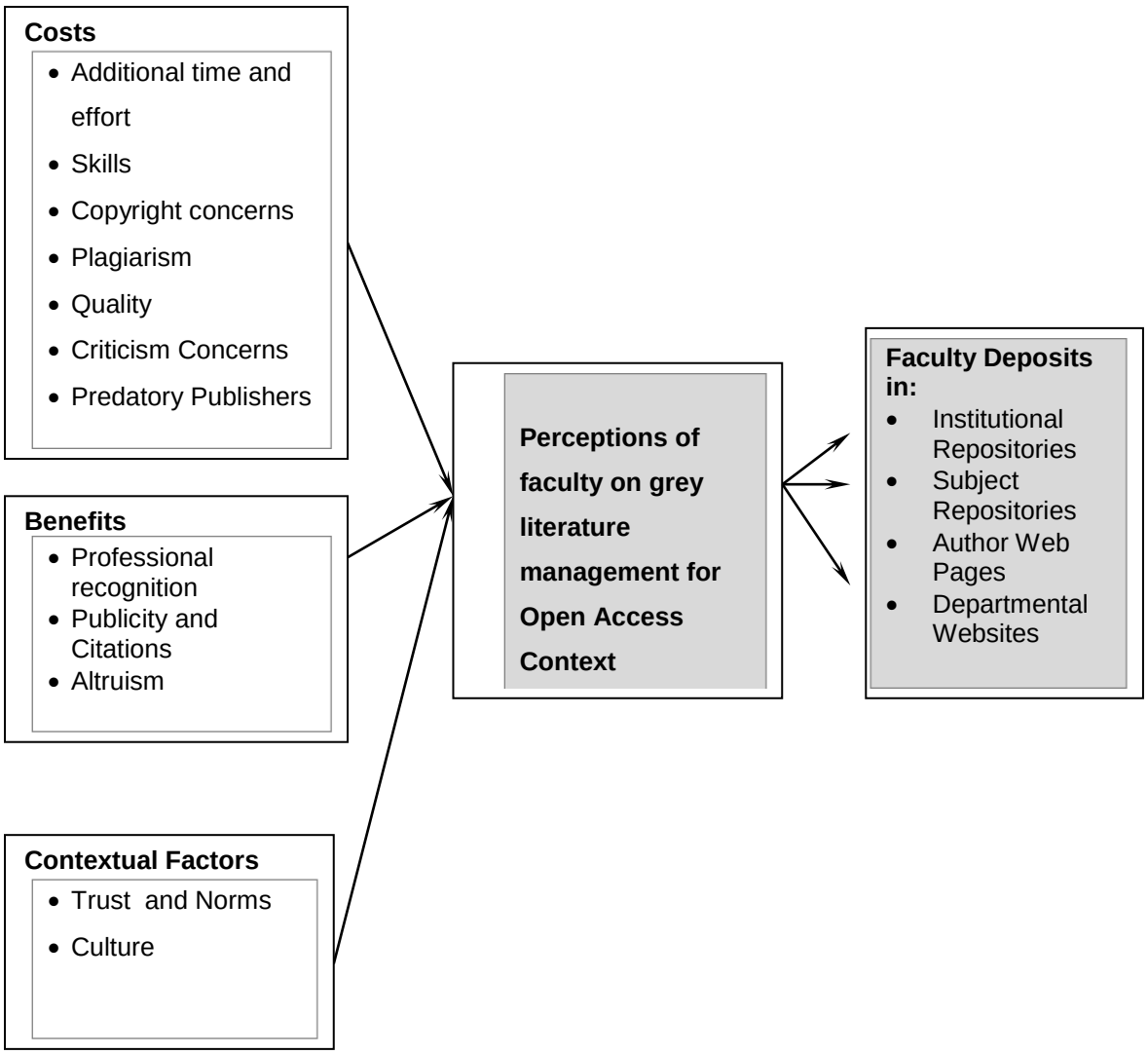

Figure 5.2: Modified Model of Factors Affecting Digital Grey Literature Management

5.3.2 Practical Implications

The practical implications of this study are to librarians managing digital grey literature. Librarians must see grey literature in its full spectrum and acknowledge the various actants that come to play in its relation. They must come to terms with the fact that faculty envisage professional recognition, citations and publicity from their publications. These are outputs which the IR alone may not be able to offer. As such, the librarians must be willing to extend their tasks to subject repositories and registration of faculty

with metric systems such as Google scholar. The three are envisaged to work in tandem and provide a scenario where digital grey literature is curated, and the benefits envisaged by faculty achieved. The proposed framework is presented in Figure 4.1 in Chapter four.

5.4 Future Research

Based on the findings of this research, the researcher proposes the following:

a) **Multiple-case study**: This research employed a single case study to identify how faculty manage the digital grey literature that they produce. A multi-case study of the same would be proposed. This would greatly contribute to a deeper understanding of faculty in the context of improved management of their outputs. It would also serve to present a better understanding of SC factors in relation to sharing grey literature.

b) The research identified one new actor in the ANT framework of sharing digital grey literature in an OA: Predatory Publishers. There is need for more research to be conducted on this phenomena, given that the number of such publishers is increasing. The faculty may not be aware and a negative experience of the same could be a great detriment to future information sharing.

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APPENDICES

APPENDIX 1: PARTICIPANT INVITATION LETTER

To

_____

5th February 2011

Re: Faculty management practices of digital grey literature in an open access context

Dear Sir/Madam,

Academic staff are involved in production of knowledge. This knowledge sometimes exists in forms that have not been published officially or, if published, is distributed in limited copies. Such works include reports, conferences, cases, thesis, working papers, models, pre-prints etc, and are collectively referred to as grey literature.

In an increasingly interconnected world, technology makes it possible to manage such works to reach a bigger audience. This is a task often initiated by the creator of the work. It is for this reason that I am undertaking a study to find out how faculty manage these forms of scholarly outputs in this kind of environment. The research is in partial fulfillment for the award of Master of Philosophy (Information Sciences) of Moi University.

I wish to invite you to participate in this research. This will involve participating in a short interview that will take approximately one hour. In return, you will be provided with a summary of the results of the research, and may better understand how faculty perceive and manage their digital grey literature. This may benefit you as a scholar to improve visibility and impact of your research works. The researcher is committed to confidentiality as a required ethical consideration in conducting this research.

To confirm your willingness to contribute to this research, or if you would like more information, please contact me by e-mail at rgibendi@gmail.com or rgibendi@strathmore.edu

I trust that you will see the value in this investigation and look forward to your reply.

Yours sincerely,

Ruth Gibendi
School of Information Sciences
Moi University.

APPENDIX 2: PARTICIPANT CONSENT FORM

Participant consent form

Project title: Faculty management practices of digital grey literature in an open access context

Project Supervisors: Dr. Damaris Odero and Prof. Joseph Kiplang'at
School of Information Sciences – Moi University

Researcher: Ruth Gibendi

Kindly check as appropriate

- ☐ I have read and understood the information provided about this research project in the invitation letter dated
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ☐ I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- ☐ If I withdraw, I understand that all relevant information including recordings and transcripts, or parts thereof, will be destroyed.
- ☐ I agree to take part in this research.

I wish to receive a copy of the report from the research (please tick one): Yes☐ No ☐

Participant's signature:
Participant's Contact Details (if appropriate):
E-mail:
Date:
Note: The Participant should retain a copy of this form.

APPENDIX 3: INTERVIEW PROTOCOL

1. **Researcher self introduction**. Name and school, purpose of the research.

2. **Overview of interview procedure**: In this meeting, I will first explain about the research and continue with asking you some questions based on the questions that I sent you before, which will take about one hour.

3. **Overview of the research project**: As for the research, the area that I am interested in is in digital academic grey literature. I am interested in the scholarly works produced, but not published such as conference papers (unpublished), academic presentations, Thesis, business cases, open lecturers, software models, research reports and other such academic works. These works need some special attention because they are often unique. So I want to understand the procedures that you as the producer accords to them, as well as the underlying motivations and barriers encountered.

4. **Reminder of some information:** Confidentiality issue, data storage procedure, etc.

5. Ask the participants whether they have further questions.

6. Continue to the interview questions.

APPENDIX 4: INTERVIEW SCHEDULE

1. Demographic Information:
   Title.....Department.....
   Length of service in years.....

2. In the course of your teaching and research, please tell me some forms of publications that you have produced other than books and published journal articles.
   (e.g. Thesis, report, workshop papers, presentations, conference papers, seminar papers, reviews, data, software code, etc)

3. Of these, which ones exist in digital forms?

4. How have you organized the grey literature that you have in digital form? (storage, location, back ups)

5. How have you disseminated the digital grey literature that you have produced?
   What have you shared? (the grey literature forms)
   With whom have you shared (faculty, students, organizations, internet)
   How? (e-mail, slideshare, IR, subject repository, social media, sharing sites like 4shared, SU webpage, departmental web page, e-learning etc)

   Why? (motivation to share or not share)

6. Out of the grey literature works you've produced, which ones would you have preferred to share widely? Why

7. For those who have not shared
   a) What concerns make you refrain from sharing works on public forums?
   b) Discuss these factors in relation to them affecting your choice of sharing your research works now and in future:
      i) Additional time and effort required
      ii) Skills
      iii) Copyright
      iv) Plagiarism
      v) Loss of knowledge power
      vi) Financial rewards
      vii) Professional recognition
      viii) Publicity and citations
      ix) Accessibility (long term preservation)
      x) Altruism

c) If you were working somewhere other than SU, would you have shared your works? Has being in Strathmore affected your decision to share the research outputs?
d) Have you ever heard of the SU institutional repository?
e) In your discipline, do you have a culture of sharing unpublished works online?
f) What is your perceived relationship with the library staff? Has this affected your decision to share your works in the repository?
g) If the research dissemination was being conducted by Research Services, would it have changed your inclination to share?
h) In your own opinion, what could be done to encourage more sharing?

8. For those who have shared
   a) How did you arrive at your dissemination choice above?
   b) Who was involved in making the work available online (self, sought help)
   c) Are you aware of the existence of an Institutional repository at SU?
   d) Have you used the SU-Portal to disseminate your research works?
   e) What motivated you to deposit/not deposit your works at the SU Portal?
   f) What benefits did you envisage?
   g) What benefits have you actually derived?
   h) In relation to your sharing the works cited above:
      i. What do you think about the time and effort it will take?
      ii. The additional skills required to do this tasks?
      iii. Concern about violating copyright
      iv. What do you think about plagiarism
      v. Loss of knowledge power
      vi. Financial rewards
      vii. Professional recognition
      viii. Publicity and citations
      ix. Accessibility (long term preservation)
      x. Altruism
   i) In your discipline, do you have a culture of sharing unpublished works online?
   j) If you were working somewhere other than SU, would you have shared your works? Has being in Strathmore affected your decision to share the research outputs?
   k) What is your perceived relationship with the library staff? Has this affected your decision to share your works in the repository?
   l) If the research dissemination was being conducted by Research Services (or another department), would it have changed your inclination to share?
   m) In your own opinion, what could be done to encourage more sharing?