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Keywords: Institutional repository, Open Access, faculty contribution, researchers' attitude

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ABSTRACT

Institutional Repositories (IRs) have been considered one of the disseminating and preserving methods for scholarly research publications. However, the success of IR is dependent on the contribution of researchers and faculty members. In order to investigate researchers' attitudes and their contribution to the Institutional repository a survey was conducted by taking 43 researchers as a sample study at the University of Oslo. The findings indicated that researchers were found to have a low level awareness of the Institutional repository but were interested in contributing their research work to the university institutional repository and have a positive attitude towards providing free access to scholarly research results of the University of Oslo.

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List of Abbreviations

DUO - (Digitale utgivelser ved UiO) University of Oslo Institutional Repository

FRIDA- Research Documentation System

IFLA- International Federation of Library Associations

IR- Institutional Repository

NORA- Norwegian Open Research Archive

OA- Open Access

UiO- University of Oslo

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Chapter One

1.1. Introduction

The rise of publication cost, subscription rates of online journals and the bulk production of scholarly research output in a digital format are becoming big problems and challenges to the libraries in rendering services to its users. With this fact, the emerging technologies have on the other hand brought several methods to the libraries and academic institutions for disseminating their research output, one of which is open access. Hence, libraries have started adopting open access technologies by taking institutional repositories as an alternative solution to introduce free access scholarly research results, as well as for the dissemination and preservation of digital documents as a response to the current digital age.

Hedlund (2008) maintains that the observed non-use of institutional repositories calls for a deeper understanding of open access practice by identifying the main incentives and barriers regulating the acceptance and use of new systems for open access dissemination of research results. The advantage of institutional repositories to both the academic institution and the individual, according to Westell (2006) is that "Most importantly, they ensure the long-term preservation of an institution’s academic output. They can also increase its visibility and prestige, and act as an advertisement to attract funding sources, potential new faculty and students. For the individual, they provide a central archive of a researcher’s work, they increase its dissemination."

While institutional repositories have sprung up at the academic institutions across the world Westell (2006) and Kingsley (2008) point out that so far deposit of material in institutional repositories has been slow. Hence, the researchers' contribution to the institutional repositories in many circumstances has been a threat for the effective implementation of institutional repositories.

Therefore, this paper has the purpose to investigate why the researchers' contribution to university institutional repository in this case University of Oslo Institutional Repository

(DUO) is low by surveying university researchers at the Mathematics and Natural Science Faculty.

1.2. Statement of the Problem

Many researches these days indicate that Institutional Repositories (IRs) are becoming the tool for promoting academic research work by providing open access to the academic society. According to Jone (2009), an institutional repository is now regarded by many organizations as a new and important method in disseminating research results. On the other hand, there are examples of scholars arguing that an Institutional Repository is not that much important to the research communities because the contents found on Institutional repositories are thought to be of low quality. Jone (2009) in this regard explained that "it is not yet clear whether institutional repositories will take root and flourished in the digital knowledge landscapes." Moreover, many researchers are not willing to publish their research work in the institutional repositories as long as they gain a reputation by disseminating their work in prestigious journals and through well known publication mediums.

Despite this controversy, however, currently many institutions have built their institutional repositories and started to give open access to those who are interested on the IR resources. Jone (2006) explained that "All institutional digital library services face a tough battle in being accepted on campus because alternative system usually exit and their shortcoming are not always obvious" Accordingly, considering how the institutional repositories are helping researchers and the academic communities in the university, along with the establishment and enrichment of an institutional repository its relevance and the researchers' culture and attitude towards using this resource has to be investigated. On the IFLA 2006 conference held at Seoul, a paper presented by Oliver and Swain (2006) pointed out that "The challenge remains in a numbers of areas related to the emergence of this new publishing model. One challenge is to monitor and support its progress and to identify and address important issues related to its development"

Presently Oslo University has established its institutional repository (DUO) to make scholarly research works freely accessible to the university communities to support the university research and teaching activities. Thus, as a digital library student when I was taking my internship at the University of Oslo faculty of Mathematics and Natural Science library I found that the majority (78 %)[1] of research work submitted to the University of Oslo Institutional Repository (DUO) are students master thesis and dissertation work, while the University institutional repository is expected to make available all research work which have been supported by University research grants and research council funds of the country. For this reason, I was inspired to investigate why the majority of digital document found in DUO are students' master thesis and why the researchers' contribution to DUO is low. To answer these questions the following general and specific objectives have been set.

1.3. Objectives

The main objective of this research is to investigate the attitude of researchers using institutional repositories to disseminate their scholarly research output.

The specific objectives are

- to what extent the researchers are aware of institutional repositories
- to identify the barriers that hinder researchers from contributing their research work to the University Intuitional Repositories (DUO)
- to investigate their attitude toward the institutional repository and open access
- to Identify to what extent DUO is important to their research work activities

[1] Percentage calculated from data found on February from DUO website http://wo.uio.no/stats/thesis

Chapter Two

2.1. Background

2.1.1. University of Oslo

The University of Oslo is Norway's largest and oldest institution of higher education. It was founded in 1811 when Norway was still under Danish rule. The University of Oslo has approximately 27,700 students and 5,900 employees[1] currently. Since its inceptions the University has been working dedicatedly by prioritizing goals every five years for the development of the country in general and improvements of research practices in the university in particular.

2.1.2. Aims

The University of Oslo (UiO) aims to be Norway's leading comprehensive university, comprised of nationally prominent and internationally recognized academic communities in medicine and the natural sciences as well as in the humanities and social sciences, with a special focus on long-term basic research. UiO will focus its academic activities to a greater degree on the basis of three fundamental premises which are quality and comparative advantages, need for knowledge and expertise in society at large and potential for development and cooperation.

2.1.3. Oslo University Library

The OiU library is the largest academic library in Norway, founded in 1811 together with the establishment of University of Oslo. Presently, the main library consists of four branch faculty libraries and a central administrative unit. The four Libraries are Library of Humanities and Social Science, Library of Medicine and health Science, the Faculty of Law Library and Faculty of Mathematics and Natural Science Library. Under each faculty every department has its own library.[2]

[2] Oslo University Library http://www.ub.uio.no/english/

All the faculty libraries contain different types of information resources like e-journals, scientific publishing such as thesis, books, reports etc. Some foreign literature from before 1966 is only registered in the library's old main catalogue (HK1), books and periodicals, online and e-Book resources on subscription from online publishers are found in the faculty libraries. Besides the library provides in house database search services, for example BIBSYS Ask, Institutional Repository (DUO) and of-campus database search with journals, research papers, reports and other scholarly literature which are subscribed by University of Oslo Library to the University communities also found the University libraries.

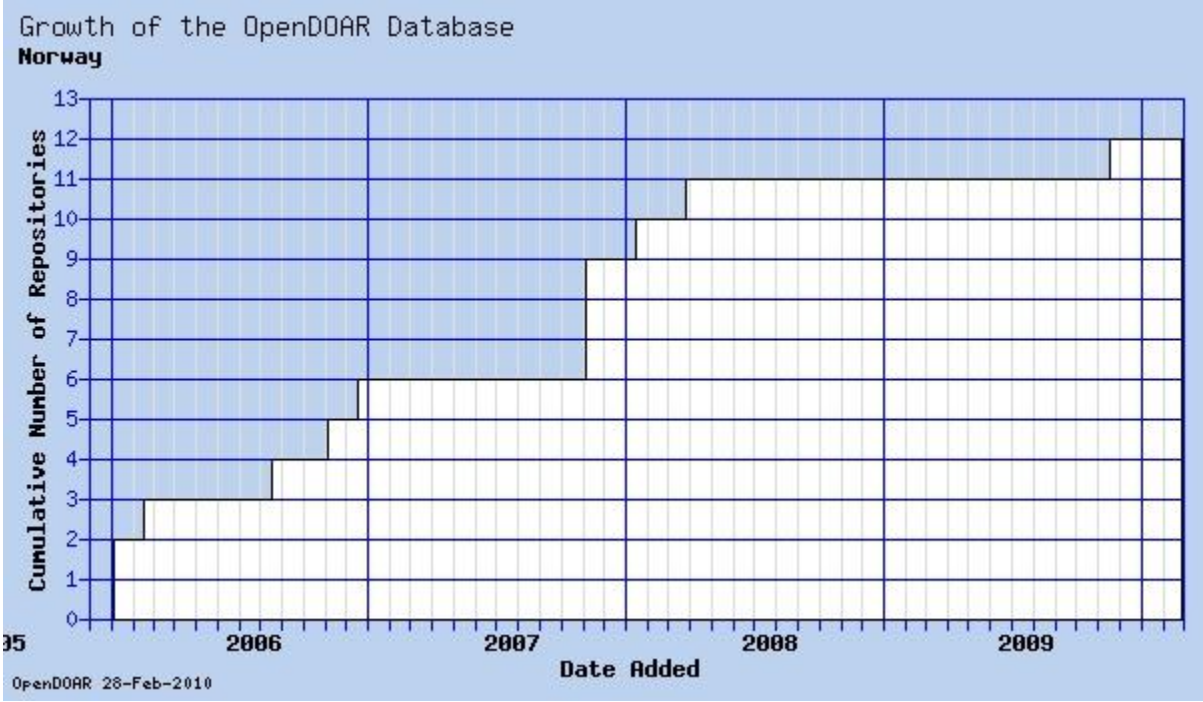
2.1.4. Institutional Repository in Norway

In Norway as indicated by Joki (2007) "All research institution must report their research publications to the Ministry of Education and Research, and research grants from the government by registering publications in a research documentation system (ForskDok or FRIDA)." FRIDA is a system for documenting research results, information and academic activities. It is made up of four modules which are Research results, Researchers' profiles, Project catalogue, and annual reporting.

Another search system that provides access to all open research archives in Norway is the Norwegian Open Research Archive (NORA), with the purpose of promoting a coordinated and powerful development of open institutional archives, and to facilitate open access publishing in Norway. Moreover, according to the OpenDOAR directory of academic open access the number of institutional repositories in Norway is growing from two in 2006 to twelve at the end of 2010. This indicates that the emphasis given to the development of institutional repositories by the Norwegian academic and research institutions is very high. However, NORA, FRIDA, DUO and other institutional repositories in Norway have different functions, thus a digital document deposited in one institution will also be collected in other repositories. This means that all resources submitted to each individual institutional repository are also found in NORA and FRIDA.

According to the OpenDOAR directory Institutional Repositories have now been implemented 100% in proportion to the higher academic institutions in Norway. The following figure illustrates the growth of IR in Norwegian universities and colleges from 2006 to the middle of February 2010.

Figure 2.1 Growth of Institutional repositories in Norway[3]



2.1.5. DUO as an Institutional Repository

One of the institutional repositories found in Norway is the University of Oslo Institutional Repository (DUO-Digitale utgivelser ved UiO). When DUO was originally established by the University IT department on locally developed software, it was intended to collect students' academic and master thesis work of the University. However, over time the university also initiated deposit of researchers and staff works

[3] The Directory of Open Access Repositories - *Open*DOAR: http://www.opendoar.org/index.html

by providing some benefits which they would get on submission to DUO. Some of the benefits indicated to be provided upon their submission are:

- Through DUO's electronic publishing, scholarly works will be made more visible to the outside world.
- DUO follows the international Open Archive Initiative standard for scholarly communication and exchange of metadata. This means that researchers' work at the university will be retrievable via national and international information services, e.g. OAIster.
- To facilitate electronic publication of scholarly works in the Nordic countries, but also to the international research communities.
- Research work is stored in DUO, UiO's electronic archive, and will always be available for researchers of the university and for others through a permanent net address.
- By retaining the copyright to researcher's scholarly works, while UiO has permission to make it available through DUO.

The above functions clearly explained the objectives of the University of Oslo institutional repository. At the same time the University of Oslo mission also stated that the university is one of the top institutes in leading and producing research output of the country. However, the research output deposited in DUO does reflect neither the University mission nor the DUO objectives though a number of research results are being produced from the University. As it can be seen in table 2.1, the number of scholarly digital documents published or deposited in DUO is about 15006 from 2002 to the mid of March, 2010, on average 1875 per year for the last 8 years. In fact 78% of these are master thesis and PhD dissertations of students work. The type of document deposited and each department contributions are described in the following sections.

2.2.6. Type of Digital Document Submitted to DUO

In order to understand and have a broad overview of the type of documents already available in DUO, its website has been visited and the following presentation has been made according to the data found from it.

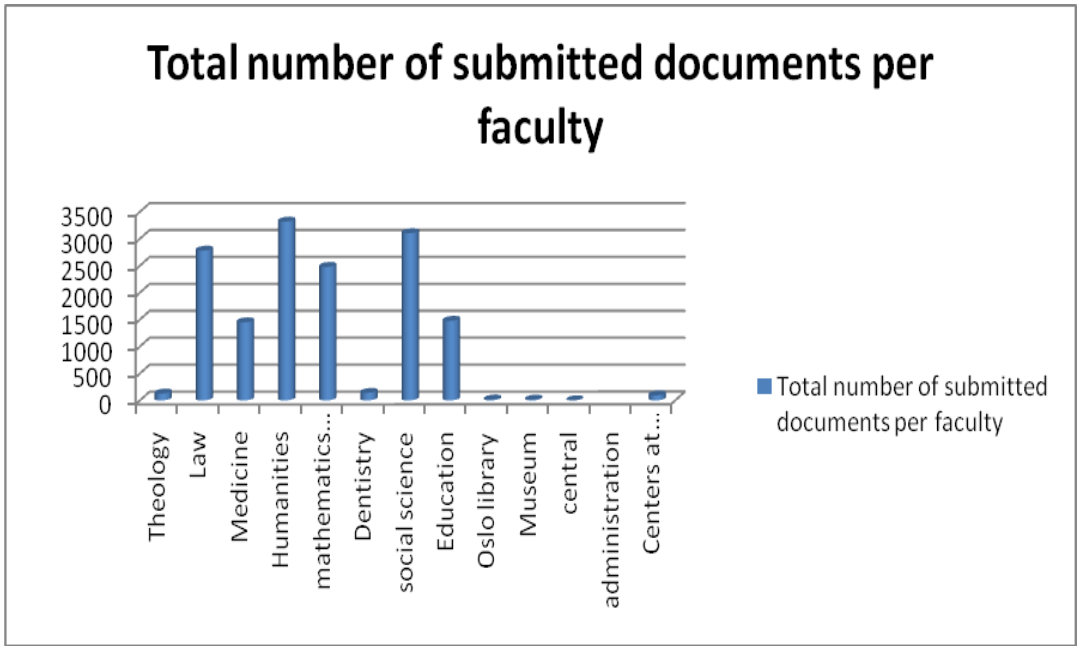
Faculty	*Type material submitted*									Total
	report	*thesis*	*dissertation*	*articles*	*monograph*	*special*	*part of book*	*series/ series title*	*conference lecture*	
Theology		*82*	*1*	*11*		*25*	*7*	*1*		127
Law		*1329*	*2*	*3*	*1*	*1438*		*1*		2781
Medicine	*6*	*1260*	*146*	*9*		*2*		*26*	*1*	1450
Humanities	*6*	*3220*	*31*	*35*	*3*	*2*		*1*	*13*	3319
Mathematics and Science	*17*	*2048*	*106*	*15*			*1*	*284*	*8*	2479
Dentistry		*135*	*1*	*2*		*1*				139
Social science		*2905*	*42*	*80*			*11*	*66*		3104
Education	*2*	*1448*	*11*	*2*			*1*	*12*	*1*	1477
Oslo library		*1*		*7*	*3*			*7*		18
Museum			*8*	*1*				*7*		16
Central administration	*1*							*1*		2
Centers at University	*3*	*58*	*1*	*2*				*29*		94
Total	*35*	*11285*	*349*	*167*	*7*	*1468*	*20*	*428*	*23*	15006

Table 2.1. Type of digital documents submitted to DUO per Faculty[4]

[4] Oslo University DUO website accessed on 12 March, 2010 http://wo.uio.no/stats/thesis

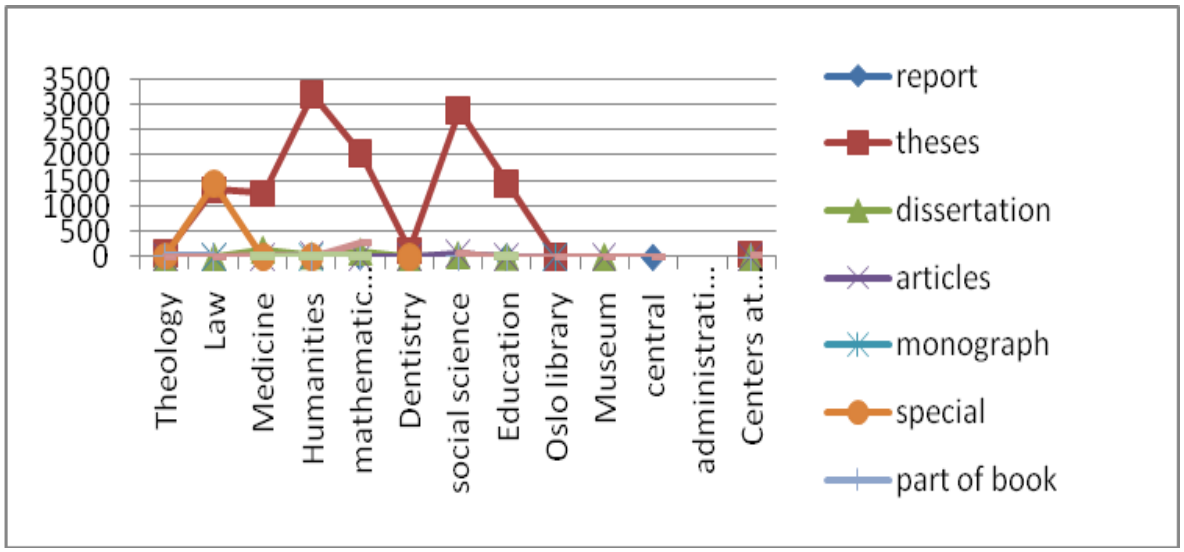
The above table shows that a total of 15006 digital documents are submitted to DUO from all the university faculties and research centers since 2002 to the mid of March, 2010. As it can bee seen from the table the larger number of documents submitted to DUO is student master thesis followed by special types digital documents. the main reason why thesis showed a very significant different number of contribution over other type of materials is because student are required to submit their work upon completion of their study by the university administrative law. However, even though the law has also asked dissertation work has to be submitted, the number of submitted dissertation still shows very low.

Figure 2.2 Total numbers of submitted documents per faculty



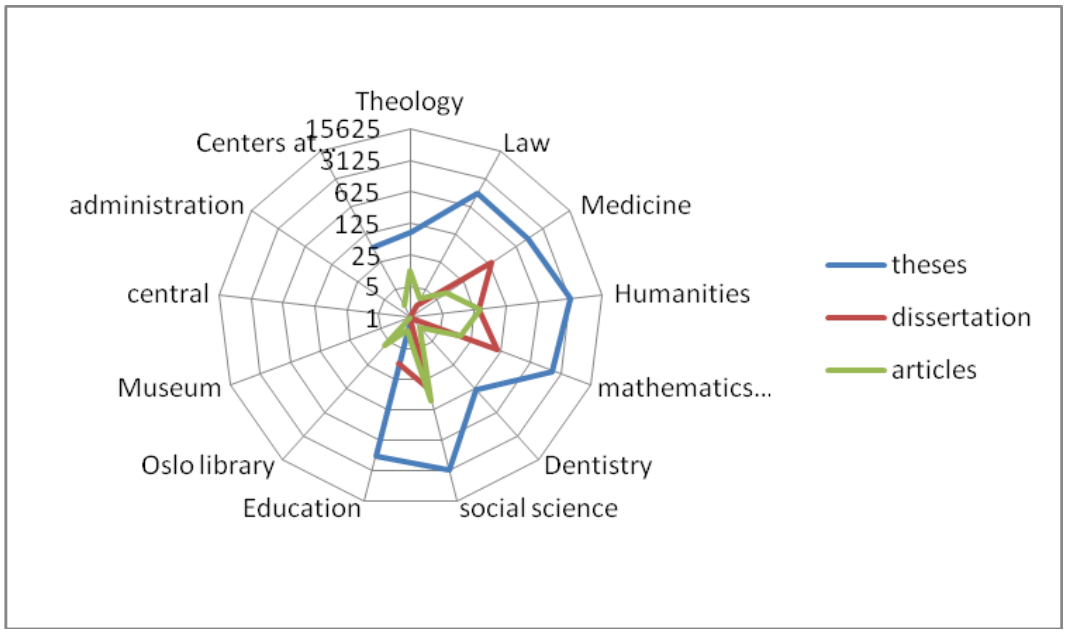
From the above digram it can be easly understood that the largest number of digital document submitted to DUO is from the Humanities faculty followed by the Social Science faculity. Centers at the university, Theology and Dentistry faculty indicates the lowset level of submission of documents to DUO.

Figure 1.3 Type of document and faculty contribution



From the above diagram it can be learned that of all the submitted documents to DUO the two highest numbers of student master thesis were contributed from Humanities and Social Science Faculty resepectvily. the third highest number of thesis have been contributed from the Mathematics and natural science faculty. Whereas the rates of sumbmitted monographs, parts of books, reports and articles are very insiginificant in every faculty. The diagram also shows that from the highest numbers of contributions of student master thesis work submitted, the faculty of Mathematics and Natural Science has a share of more than 2000 student master thesis works. However, the level of articles and research reports represent a very insiginificant number of contributions to the Univeristy of Oslo instituional repository.

Figure 2.4 comparisons between articles, thesis and dissertation



Since one of the purposes of this research is to examine the contribution of researchers articles submitted to DUO the above Fig. 2.4 shows the number of contributed articles and a comparison between student master thesis, PHD dissertations and research articles which have been submitted to DUO. in the above diagram the blue line shows the large number of digital documents contributed over the green and red lines. That means still the number of student master thesis work exceeds the number of dissertations and research articles. This indicates that the participation to DUO by the university researchers is very low.

2.2. Literature Review

2.2.1. Open Access

The proliferation of digital documents and the growing of interest to access these documents through the net have created a new method of dissemination of information. Most predominantly the coming of internet however provided an alternative advantage for scholarly publication to be accessible online with a remarkable speed regardless of its format and volume. This technological advance and other issues of research result publishing provoked the movement called "open access" with the idea of information sharing for the common good.

"Open access is the concept of making publicly-funded research freely available to all at the point of use" (Jone, 2007, P.31). The advocator's of open access Harnad (2010) described very briefly as "Open Access is free, immediate, permanent online access to the full text of research articles for anyone, web wide". Wikipedia states about the open access movement that "The movement traces its history at least back to the 1960s, but became much more prominent in the 1990s with the advent of the Digital Age. With the spread of the Internet and the ability to copy and distribute electronic data at no cost" (Wikipedia, http://en.wikipedia.org/wiki/Open_Access_movement).

Since then, academic institutions became the main campaigners of open access with the goal of sharing information for the common good. "Sharing knowledge and building partnerships have been recognized as the best and most optimal means of creating and benefiting from knowledge" (Arunachalam, 2008). Arunachalem added that open access can only be the best alternative to disseminate information when researchers, scholars, institution and administrators are willing to share their research output. He said, "Scholars' and researchers' willingness to share knowledge, and advances in technology which enabled opening up free access to information."

Moreover, currently as much research is done on Open Access it is evident that it is becoming an issue of discussion "among different professional, research groups and organizations such as researchers, academics, librarians, university administrators,

funding agencies, government officials, commercial publishers, learned-society publishers, in libraries, scholars, academic institution and academic institution administrators" (Wikipedia, par. 2). The discussion mainly focus on two basic different but complementary concepts of which would be the best method to share information for the common good known by the "gold" and "green" road models to open access.

According to Hernand (2010) explanations the green and gold road to open access means,

> *The "golden road" of OA journal-publishing, where journals provide open access to their articles (either by charging the author-institution for refereeing/publishing outgoing articles instead of charging the user-institution for accessing incoming articles, or by simply making their online edition free for all) and the "green road" of OA self-archiving where authors provide OA to their own published articles, by making their own e-print free for all.*

On the other hand with the current digital divide and technological gaps for the developing and developed countries, in most cases for the developed nations open access is not by far the primary issue of their concern in their scholarly publication process. "Researchers based in institutions in first world countries already have “open access” to much of what they require because their institution subscribes to it. Open Access is not necessarily an issue for them" (Kingsley, 2008). However, Stangeland and Moe (2006) suggested that Institutional repositories are not only a question for less developed countries but also it is in the interest of the public in the developed parts of the world, maintaining that "Open Access may be in our interest that our local physician can update themselves on current research and treatment of various diseases."

Furthermore, Arunachalam (2008) on this regard argued that,

> *Open access is not about publishers and profit or about libraries and budgets. Open access is about increasing access to knowledge*

especially current advances, for scientists, scholars, teachers and students. Open access is not only about making the field level playing for scientists and scholars who cannot afford to pay for accessing information relevant to their research. It is about increasing the rate at which new knowledge can be created and applied to the benefit of humanity.

2.2.2. Open Access and Library

Even though the open access initiative faced strong resistance from some scholar groups who are arguing that the idea of providing free access to research results might have a negative impact on research communities; however, libraries are the most benefited institutions in achieving their goal through the Open Access technologies and ideas. The rise in subscription costs of scholarly journals and the emerging of new technological publishing and dissemination methods for research results pushed libraries to implement open access as one of their means to disseminate and preserve digital information resources. Buehler and Boateng (2005) indicated that "Library Institutional Repositories (IRs) allows libraries to provide direct access to scholarly materials instead of through the systems of serials' publishers and vendors"

Furthermore, the coming of Open Access has also opened new communication ways between the research communities, publishing agencies and libraries. As Jone et al. (2006) explained, "The marriage of research generation by academics, with output management by librarian, has created a new form of publication, with open values, which presents a growing challenge to the commercial publishers which have controlled research publications for many decades" p.30. Besides, the concern of space to accommodate physical information resources can also be resolved by creating digital repositories in general and institutional repositories in particular. Hence, libraries are now in a momentum in adopting new technologies in its physical collections and collection types; Buehler and Boateng (2005) said, "Throughout the twentieth century libraries have evolved from totally physical spaces to a blend of physical and virtual

environments", they have started to reconsider their service for information dissemination according to the collection and the space they already have.

Moreover, the main reason that open access initiatives are being widely accepted by the libraries according to Chan (2004) and Harnad et al. (2008) is that libraries budget are decreasing over time, and even from the small available budget the lion share is being taken by the subscription of periodicals and research journals. Similarly, most high-flying journals are owned by the big commercial publishers which have made it almost impossible to share resources between the research communities (Chan, 2004). For this reason Harnad et al. (2008) explained that because libraries cannot afford to buy all published articles through subscribed journals much of the potential research impact of those inaccessible articles is being lost. Hence, in the Budapest Open access initiative meeting campaigning for freedom of research information suggested that "The libraries proposed to support the transition, publicize the benefits and to highlight open access journals" (Jone, 2007, p.33) as a means for providing research output to the library users.

Academic libraries are not outside of this reality where much of the research publication results are being produced from their mother institution; however, they are required to pay for the subscription of those products to be accessible to their user which means that they have to pay for both the production and subscription of scholarly articles. As McCormick (2006) said that "The fundamental role of a university library is to provide the intellectual resources to support the research and teaching needs of its faculty and staff." Therefore, it is not surprising that the academic libraries took the initiative to build institutional repositories to support the teaching, learning and research activities of their institution with the minimum of cost as well as introducing a different approach to disseminate and preserve research results. "Academic libraries wishing to establish IRs is consistent with an educational milieu that contains an existing complex suite of information resources required to support a research and learning environment" (Buehler & Boateng, 2005).

Buehler and Boateng further explained that "IRs also foster the reform of the scholarly publishing system by supporting the open access movement, which advocates free online access to scholarly materials with minimal restrictions on their use." Hence, when every institution or a consortium of institutions would enter their e-prints into an IR and share useful academic and research products as Basfsky (2009) this contribution will enhance and stimulate study with in the research community and scholarship, thus libraries would also benefit from it. Furthermore, the Open Access movement goal, to share information for the common good and campaigning for "freedom of research information", would be achieved. This would also create popular acceptance and recognition of Institutional Repositories (IRs) among the universities and research institutions libraries.

2.2.3. Institutional Repository (IR)

The Open access movement has devised two approaches to achieve open access as the way to disseminate research output. This movement was initiated to make research results free access through the "Green" and the "gold" road models to open access. The Budapest Open Access Initiative's on the other hand described these approaches (as cited in Chan, Sousa & Sweezie, 2005) that "Two prong but complementary strategies of the so-called 'gold' road, or open access publishing, and the 'green' road, or open access self archiving of published research". Based on these strategies; however, articles in a repository do not have formal, external quality control check, still they provide a way to be accessible to users. Johnson (as cited in Westell, 2006) pointed out that "A digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end-users both within and outside of the institution."

According to Basefsk (2009), "The Institutional Repository (IR) concept was born out of competition for who was going to be responsible for dissemination of an institution's intellectual product via the internet." Furthermore, McClendon (as cited in McCormick, 2006) said the Institutional Repository (IR) concept has gained momentum as universities begin to question the logic of buying back [their] research. Lynch (2003)

further predicted "Institutional repositories will succeed precisely because they are responsive to the needs of campus communities, and advance the interests of campus communities and of scholarship broadly." Alternatively, Jone (2007) explained that "The information environment is undergoing a period of change, from the delivery mechanism of materials to the expectation of the users of information service; institutional repositories are a response to some of these changes" p. 48.

Thus, IR is perceived to be one of the methods to address users' information need by different groups though they are faced with many obstacles to grow as expected. A paper presented to an open access conference by Beers (2009) explained that "A 2008 study showed that less than 20% of all scientific articles published were made available in a green or gold Open Access repository. Self-archiving is at a low 15%, and incentives to do so increase it only to 30%." The major problem for IR development Antelman (2004) said, "The first potential danger is that institutional repositories are cast as tools of institutional (administrative) strategies to exercise control over what has typically been faculty controlled intellectual work as the distribution of IR." Copyright issues, institutional branding, peer review, faculty compliance and other challenges made the implementation difficult and costly (Basefsk, 2009). Basefsk added that "The IR was perceived to be an end unto itself."

However, having all these challenges faced the institutional repository, many scholars still believed that IR will have a lot to contribute to the scientific community if they are well managed and perceived to be one of the outlets as a dissemination and preservation method for the scholarly research results. In fact, here individual and institutional commitment for the IR development is crucial. The Berlin Declaration on open access has also explained that "Establishing open access as a worthwhile procedure ideally requires the active commitment of each and every individual producers of scientific knwoldge and holder of cultural heritage." Hence, Antelman (2004) identified that "Although debate swirls around questions of copyright, peer review, and publishing costs, individual authors are taking action in this arena by posting their articles to personal or institutional Web pages and to disciplinary

repositories." However, the case is made that to increase the value and use of institutional repositories, a critical mass of content is key factor (Blythe & Chachra 2005). This implies that content also matters for the success of IR besides the individual commitment to submit their work to IR.

Therefore, in administering an institutional repository identifying clearly its purpose, maintaining a critical view of how the IR would be the best tool for disseminating research results, and identifying its technological drawbacks, advantages and challenges are the most important things. "Expanding the role of the institutional repository integrating functionality with other resources, and increasing exposure of the IR through collaborative projects are crucial to unlocking the full potential of an institutional repository" (Wise, Spiro, Henry and Sidney Byrd, 2007). Furthermore, Lynch (2003) suggested that the success of IR can be achieved in a collaborative effort through collaborators as, "An effective institutional repository of necessity represents collaboration among librarians, information technologists, archives and records mangers, faculty, and university administrators and policymakers." The undeniable fact here is that if institutional repository are coordinately implemented and managed then their contribution to academic and research institutions will be fruitful.

2.2.4. Institutional Repositories and Academic Institutions

The Institutional repository and the academic institution are the two inseparable issues in today's e-print dissemination and preservation of research results. Lynch (2006) pointed out the significant role to play IR for academic institution as, "The development of institutional repositories emerged as a new strategy that allows universities to apply serious, systematic leverage to accelerate changes taking place in scholarship and scholarly communication." Jones, Andrew and MacColl (2006) explained that "The faster the research is known and understood, the faster we all benefited." Hence, Institutional Repository can play effectively communication tool role with the very remarkable speed. Alternatively, McClendon (as cited in McCormick, 2005) described that IR can preserve and provide access to a university’s unpublished material, establish alternatives to the high costs of traditional publications, and contribute to a

university's prestige. Above all institutional repositories in academic institution can fulfill two basic requirements according to Jones (2007), firstly it serves as a method of disseminating output under the aegis of the organization and secondly helps as a central location and focus for the collection of the output of the organization research result information.

Furthermore, Westell (2006) on his part said, "The institutional repository can provide excellent examples of initiatives that speak directly to research and scholarship. It can also provide a rich set of data to illustrate the breadth and depth of research being carried out at the institution." Hence, "Institutional repositories can facilitate greatly enhanced access to traditional scholarly content by empowering faculty to effectively use the new dissemination capabilities offered by the network" (Lynch, 2003).

A study conducted by Lynch and Lippincott (2005) on the distribution of Institutional repositories among the European Universities indicated that "In Europe and Australia estimated that the proportion of universities with an IR varies from 5% in Finland to 100% in Germany, Norway, and the Netherlands." This evidenced that much attention had already been given to the development of IR in the academic institutions of Europe. Therefore, the importance of IR to the academic institution has been recognized by many academic and research institutions as one of alternative means of resources sharing technologies in the teaching, learning and research activities. Lynch (2003) explained, "IR facilitating change not so much in the existing system of scholarly publishing but by opening up entire new forms of scholarly communication that will need to be legitimized and nurtured with guarantees of both short- and long-term accessibility."

Lynch further enlightened his view of IR to the academic institution as, "A university-based institutional repository is 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." Therefore, it is possible to say that researchers in particular and academic institutions in general have got an advantage and alternative means to disseminate and preserve their research output.

2.2.5. Institutional Repository and Researchers

The coming of Information technology, more specifically the Internet, brought about new ways of doing and disseminating research and research output respectively. For this reason a new culture of approaching research practice has already been created, and researchers are the most welcoming group for this current technology. One of the tools for such practice is adopting, implementing and using institutional repositories. Van de Sompel stated (as cited in Jones, Andrew and MacColl 2006, p.18) that "Scholars deserve an innately digital scholarly communication system that is able to capture the digital scholarly record, make it accessible, and preserve it over time." Wise et al. (2007) on his part explained that "As organizations and universities adopt institutional repositories to archive and access scholarly papers, new and expanded uses are found for these powerful tools." Furthermore, Institutional repositories for researchers not only disseminate born digital documents but also help them to self archive digitized material such as books, book chapters, and other course material to their student and for the future use (Wise et al., 2007).

However, Westell (2006) pointed out this new culture need some effort to be of use by the researchers and academic institutions as, "Changing the culture of scholarly communications is not an easy job and uptake remains slow in the academy. Many repositories are using the “if you build it, they will come” philosophy." Furthermore Beers (2009) stated that researchers and their work habits are the greatest barriers that Open access repository managers encounter. Even though the concept of open access is well known among academic researchers their research and publishing practices have still not undergone a radical change. Therefore, the important question regarding non-use of institutional repositories has lately been raised (Hedlund, 2008). However, as Kim (2007) in his study identified that even though the participation of researchers to IR is still in its low level, faculty contribution can also be considered as one of the success factors for an IR.

Hence, one can argue that the success and the failure of institutional repositories in academic institutions depend on the active participation of academic authors to IR and

their perception to contribute to it; Moreover, Shearer suggested that (as cited in Kim, 2007) "The success of IRs will be determined eventually by their uptake and use by researchers." Wilson in his part (as cited in McCormick, 2006) explained that "The whole idea of self-archiving in institutional archives is based upon false assumptions about the behavior of academic authors." Most academic authors perceived the Institutional repository as means of preservation more than as a means of disseminating their research output and this perception will have negative impact on their participation to collaborate with the institutional repository. Another reason which was identified for the low level of participation to the institutional repository by Foster and Gibbons (2005) is that researchers most of the time worried about the copyright infringement and disciplinary work practices (e.g., co-authoring or versioning) when they published their work to the IR.

As a matter of fact a large number of studies are also showing that the article and research result disseminated and published at Institutional repository have got more citations than other publishing methods, which means that open access articles have a significantly higher citation impact than non-open access articles (Jones, Andrew & MacColl; Harnad et al, 2004). Kingsley (2008) in this regard said, "If one moves from scholarly communication and turns to open access, the audience becomes considerably broader." Thus, if the IR can attract large audiences then research result disseminated by it and the chances to be cited by other authors will be increased. A study of web-linked citations of scholarly articles by Carlson (2005) identified that "approximately one third were no longer active and a further third no longer pointed to information pertinent to the citation" which actually mean that the link to the sources are removed from the web sources, a difficulty which can be fully addressed by the institutional repositories today. Alternatively, Antelman (2004) investigated in his research that "In philosophy, political science, mathematics, and electronic and electrical engineering, open access increased research impact, as measured by citation rates in the ISI Web of Science database."

Hence, Carlson (2005) said that this is a powerful argument to convince researchers that their material should be housed in an institutional repository which will have as result the success of the institutional repository and would also gain more citation for articles in the IR. Westell (2006) however said this does not mean that this is the only argument to convince researchers to increase their input to the IR. He further pointed out that "as a success factor, this is more difficult to measure; however, it is suggested that where researchers who are familiar with the repository from both the input and searching sides will use it." In other words, the information professionals and the host institution in general should play a very vital role in attracting and creating awareness of researchers' attitude toward the potential IR for the research community to make it usable in addition to those authors who are accustomed with it.

Lynch (2003) argued that free access to scholarly publication has changed scholarly communication as,

> *The development of free, publicly accessible journal article collections in disciplines such as high-energy physics has demonstrated ways in which the network can change scholarly communication by altering dissemination and access patterns; separately, the development of a series of extraordinary digital works had at least suggested the potential of creative authorship specifically for the digital medium to transform the presentation and transmission of scholarship.*

Therefore, this low level of collaboration between the institutional repositories and researchers should be mediated in many ways such as presenting the success stories about the achievements of institutional repositories to them. Furthermore, Westell (2006) pointed out that work still needs to be done to successfully integrating a repository into the research culture while (Bees, 2009 and Harnad et al, 2008) suggested that the only way to guarantee 100% self-archiving is with an institutional mandate.

Chapter Three

3. Methodology

3.1. Type of Research

The type of this research is qualitative survey case study. Most commonly behavioral studies are categorized as a qualitative study. As Myers (1997) specified, "Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live." Moreover, in qualitative research studies researchers will have a chance to interpret and find out meanings from the collected data. Therefore, this research is a study of attitude of researchers in the University of Oslo and has also tried to interpret and find out meanings from the collected data, therefore, it can be categorized as a qualitative survey case study. Furthermore, the study was focused on collecting data from one institution, in this case University of Oslo, a qualitative case study research methods of approach was believed to be more appropriate to investigate researchers attitude of the university researchers. "Qualitative methods produce information only on the particular cases studied and any more general conclusions are only hypothesis (informative guesses)" (Wikipedia, par. 2).

3.2. Data Collection Method

The data collection method used to conduct this research was a partially structured questionnaire and purposive sampling method. The reason for using a semi-structured questionnaire was to provide an opportunity for the respondents to write their own thoughts in addition to the given alternatives if they have any. Another reason for using a questionnaire-based method for this research was to have more responses than by interviewing a few researchers. The decision to use purposive sampling in this study was taken because the study is a qualitative survey study where the purposive sampling method was thought to be appropriate. Interview by nature is time consuming for both the researchers and respondents. The chosen target groups for this research were also found to be difficult to interview because of the nature of their work. Thus, taking the

Physics department library of the University of Oslo as the survey return point, printed copies of questionnaires were distributed in the first phase among the faculty of mathematics and natural science researchers through the university internal post. However, because of the low responses of questionnaires distributed in paper form in the first phase, the same questionnaire was developed online and distributed in the second phase to collect more data from the respondents. To develop the online survey free software called Kwik surveys (http://www.kwiksurveys.com/) has been used.

In addition, secondary data were also used to give more description and background information of the subject and about the institution such as online usage data of institutional repository in University of Oslo, data on number of contributed documents, type of submitted digital document to DUO and search hits from the DUO home page. Furthermore, review of related literature was also conducted.

3.3. Scope

Though the University of Oslo Institutional Repository (DUO) is being used by the students, publishers, and other academic staff, because of the short time available to conduct this research, the scope of this study was only limited to researchers in University of Oslo faculty of Mathematics and Natural Science. Moreover it was thought more interesting to study researchers in this faculty than in other faculties.

3.4. Pretesting the questionnaire

The designed survey was distributed to digital library masters students to make them participate in a pretest and to receive their comments before the actual survey has been distributed to the targeted informants. Six questionnaires have been returned with comments and suggestions; moreover, comments from the online questionnaires have also been collected. Having considered all the comments from the digital library masters students and comments from the online questionnaires the corrected questionnaires were distributed to the informants.

3.5. Limitation

To conduct this research the researcher faced the difficulties of language problems, as some of the relevant information/data found on the DUO website were presented in Norsk (Norwegian language). Furthermore, due to time limitations, to collect data from all the university researchers would be impossible. Furthermore, there might also have been users of a different nature in each department and faculty, and to identify this within the given time would make it impossible to finish this research. However, this study can be used as an input for those who wanted to make further investigation at a larger level about researchers' attitudes in the University and research communities toward the institutional repository and open access issues.

3.6. Theoretical Framework

Communication barriers may create difficulties and misinterpretation in the ideas to be transferred from one participant to the other. Furthermore, individual perception of the communication channel would also affect the meaning of the information to be transferred. Likewise, digital libraries today are perceived differently by many scholars; however, it is now serving as a bridge between the electronically stored information and receiver as a scholarly communication tool. Hence, in this bridge it can be easily identified that there exist two major participants in either end. The medium in question can be examined by many models and theories, however, according to Wikipedia, "The socio-technological theory is an approach to complex organizational workplace that recognizes the interaction between people and technology in the work place." (Wikipedia, http://en.wikipedia.org/wiki/Sociotechnical_systems, par.1). In this regard Cartelli (2007) also stated that "Socio-technical theory hypothesizes the presence of two subsystems in every organization or corporate; they are the technical sub-system and the social sub-system." Furthermore, Coakes (cited in Cartelli, 2007) described this theory as "More recently, the importance of the consideration of individuals' participation in the life of the organization increased, and a leading role for autonomous and/or

semiautonomous groups within the organization and for communities of practices was recognized."

Hence, digital libraries as a system can be evaluated by this theory considering that the two subsystems already are in existence. In this case the technical subsystem is the technology used for the implementation of the digital library and the social subsystem is the people who are participating in the digital library accomplishment. Similarly, IR as a digital library can also be examined by this theory that a workplace could be a University or the institution where the institutional repository resides, the technology (software and hardware) used for establishment of institutional repository as a technological subsystem and contributors (researchers, students, the institutions, etc) to the IR as a social subsystem. Kim (2007) explained that "IRs can be regarded as a type of digital library constructed by a university community through contributions of scholars and other members of the community."

In any system the failure of one subsystem could result in the malfunction of the whole system. This also applies to institutional repositories where regardless of very sophisticated software technologies used to implement institutional repositories, unless a good number of participant of scholars are found who could be able to contribute then the objective of the institutional repository will not be realized. This means intertwining and working together of both subsystems could cause the system to function properly. Cartelli (2007) said, "Many researchers, while studying the resistance of the work force to innovation and especially to the introduction of technological systems for work automation, suggested that a fit between the two sub-systems was needed for the overcoming of the workers' difficulties and for the achievement of the expected benefits from management."

The main interest of this research was to investigate the attitude of researchers toward the institutional repositories; it is therefore reason to believe that evaluating this research from the socio-technological point of view is reasonable. However, as the socio-technological theory provides a way to see a system from the social and

technological context, investigating the attitude of researchers can also be examined more in detail from the social sub system of the theory as a subsystem of the institutional repository. Attitude according to Webster online dictionary means "a complex mental state involving beliefs and feeling and value dispositions to act in certain ways". Wikipedia also define as "An attitude is a hypothetical construct that represents an individual's degree of like or dislike for an item" (Wikipedia, http://en.wikipedia.org/wiki/Attitude_(psychology)). Therefore, the degree to which researchers like or dislike IR as an item may have an impact on their contribution to IR. Studying researchers' attitude to IR is difficult but it is possible to identify by examining factors and components which influences the researchers' perception of IR as scholarly communication medium. Basically, the components such as their interest to know a new work style, their awareness of the IR, their past experience and present knowledge of the IR, their work culture and the system, researchers' expectation are some of the factors that help to investigate researchers' attitude. Furthermore, academic or professional ethics, incentives, rewards, promotion, and intuitional branding would also have their own impact on researchers' attitude to IR.

It has been reflected in many previous studies that researchers' perception of IR has been influenced by some of the above stated factors. A model developed by Kim (2007) for evaluating factors affecting researchers' contribution to IR presented that cost, extrinsic benefit, individual treat, intrinsic benefit, and contextual factors can motivates researchers to contribute to IR. Another factor identified by Kim that influences the researchers to contribute to IR were, awareness of IR, future plan to contribute, past experience of using IR. Kim (2007) by surveying 31 faculty professors using an online survey, found that only 9 (29%) were aware of the IR. from 31 researchers 13 (41.9%) were found to be planning to contribute to the IR in the future. moreover, their experience were that 22 (71%) had made their research/teaching materials publicly accessible through venues other than the IR.

A study conducted by Foster and Gibbons (2005) which interviewed 25 professors at the University of Rochester about why faculty members did not submit their content to

the institutional repository found that copyright infringement worries and disciplinary work practices (e.g., co-authoring or versioning) made them not to contribute actively to the University IR. They also identified from the interviews that faculty members developed their own routines to create and organize documents. Besides, faculty members perceived that IR contribution involved additional work, such as metadata creation for contributed objects.

Another study conducted by Swan and Brown (2005) on "Open access self-archiving: An author study" have also found that awareness of self-archiving as a means to providing open access of authors work only twenty nine percent of them were aware of IR and open access and 71% were not. Therefore, these research findings clearly show that many factors can affect researchers' contribution to IR.

By the same token, having adopted the method used by the previous researchers, it has been tried to find out factors affecting researchers' contribution of their article to the University of Oslo Institutional repository (DUO). Hence, this survey using paper format questionnaires and online survey to collect data from the Mathematics and Natural Science faculty of the University has surveyed 45 researchers through either the online or paper surveys. The survey of this study has also found out most interestingly that 31 out of 45 respondents were unaware of institutional repository. On the other hand 32 out of 45 researches have showed a positive attitude to open access and institutional repositories. However, they are found to be more interested to contribute their work for other prestigious and to profession/research group open accessed website/journals than the institutional repository of their institution. This finding is in accordance to the socio-technological theory that researchers are influenced by their past experiences that they are more tending to contribute their work to the prestigious journal than the institutional repository of the university. The following chapter have tried to identify some of the factors that affect researches contribution of their scholarly results to University of Oslo Intuitional repository, such as their interest, past and future plan of self archiving of researches, etc at the faculty of Mathematics and natural science.

Chapter Four

4. Data Analysis and Interpretation

As described in the introduction of this paper, the level of participation of researchers to contribute their scholarly product to the University of Oslo institutional repository were found to be very low. Therefore, to survey the University researchers' attitude and perception of the institutional repository (DUO), questionnaires were distributed among the faculty of Mathematics and Natural Science researchers. In this survey study a total of 100 printed paper questionnaires were distributed among the faculty researchers from which 12 questionnaires were returned in the first phase. As a result of low response rate from respondents, a second attempt was made to collect data by online survey. On the Online survey when first distributed to the informants', a technical error occurred which impeded respondents from choosing some of the multiple choices which were asking for more than one answer. In the end, this technical error made in developing the online questionnaires only affected three questions from all the questions of the survey, and it has also been found that it didn't create any significant difference in the results of the survey because even in the paper questionnaires format most of the respondents did not use the chance to choose more than one answer. However, by correcting this error the survey link was distributed again for a second attempt. Hence, in the first and second online survey data collection attempt 33 questionnaires were responded to, which make up a total of 45 respondents including the first 12 collected by paper format. On the base of these responses the following analysis and discussion have been made.

4.1. Respondents Profile

The following table shows respondents profile according to their academic status and age groups

No	Academic status	Age group				
		<30	31-43	44-45	>56	Total
1	Professor		3	5	5	13
2	Associate and Assistance professor (F*ørsteamanuensis)*		4	3	2	9
4	Research fellow (*Postdoktor)*	4	4			8
5	Research assistant (*Stipendiat)*	3	12			15
Total		7	23	6	9	45

Table 4.1 Respondents profile according to their age

As it can be seen in the above table, a total of 45 respondents participated in this survey study. Looking at academic status distribution according to respondents' age shows that the majority of professors, associate professors and assistance professors are above age 44 whereas respondents in the category of research fellows and research assistances academic status all were found to be below age 43. In this survey assistant and associate professors were asked to respond separately but considering their age and professional status both the associate and assistance professors are combined together in the above table.

4.2. Age and Researchers' Awareness to IR

No.	Age group	Are you aware of IR concept?	
		Yes	No
1	< 30	1	5
2	31-43	7	16
3	44-55	2	5
4	> 56	4	5
Total		14	31

Table 4.2 Respondents age and their awareness to IR

Researchers were asked about their awareness of the institutional repository, and this was cross-tabulated with their age group. From the above table it can be seen that the awareness level seems equally distributed among the age groups and the level of awareness gap below age 43 seems wider than the age group above 43. However, according to their responses as shown above in table 4.2, regardless of their age the majority (31) of the respondents out of 45 researchers did not have any knowledge of institutional repository and only 14 were aware of IR in general.

4.3. Academic Status and Researchers' Awareness to IR

Academic status	Are you aware of IR concept		No for IR awareness In (%)	Total Responses
	Yes	No		
Professor	5	8	62	13
Associate and Assistant professor (F*ørsteamanuensis)*	2	7	77	9
Research fellow (*Postdoktor)*	1	7	87	8
Research assistant (*Stipendiat)*	6	9	60	15
Total	14	31	69	45

Table 4.3 Respondents academic status and their awareness to IR

To identify whether their academic status influenced their awareness to the institutional repository the above table tabulates both their academic status and their responses to the question of their awareness. The level of awareness according to their academic status was found to be almost similar at all academic status levels. However, in the academic status of associate and assistance professor, and research fellow the level of awareness is found to be lower whereas in the professor and research assistant status groups the gap is almost similar. This might be due to the reason that research assistants were more aware of DUO because at the end of their study they must submit their thesis to the university institutional repository whereas in the professors' academic career this group is very much aware of research practices and experiences so that this might help them to be more aware of IR than assistant and associate professors and research fellows.

4.4. Respondents awareness to IR and DUO, and their interest to contribute to DUO

Responses	Are you aware of the Institutional Repository (IR) concept?	Do have any awareness of the Oslo University Institutional Repository?	Would be interested in contributing content to DUO?
Yes	14	27	26
No	31	18	5

Table 4.4 Respondents' awareness and their interest for contribution to IR and DUO

To learn researchers' awareness of IR and DUO as well as to identify their interest to contribute to the University of Oslo Institutional Repository (DUO) the above questions in table 4.4 were asked to the respondents. Their responses show that more researchers were aware of DUO than of the general concept of IR. At the same time it has been found low level of IR awareness, high level of DUO awareness and interest to contribute to DUO. It has also been found that their level of awareness of IR is very low however the interest to contribute to DUO were not affected by their low level of IR awareness. The above table 4.4 shows that out of 45 respondents 31 respondents were found to be unaware of IR and 18 also unaware of DUO but their interest to contribute were still great, only five researchers were found to be not willing to contribute. This indicates that most of the researchers might have perceived DUO and IR as two different things or their might not have perceived DUO as an Institutional repository.

4.5 Type of material which Researchers are interested in contributing

Another question which was asked to the researchers is what kind of materials would you be interested in contributing to DUO? The following table shows their preference to contribute to DUO.

Type of digital document	Responses according to their academic status (n=26)				
	Professor (5)	Associate and Assistance professor (5)	Research fellow (2)	Research assistant (14)	Total (26)
Scholarly books	1	1	1	3	6
Scholarly articles	1	5	1	9	16
Technical papers	1	4	1	3	9
Pre-prints/post prints	3			3	6
Course materials	1	1	1	2	5
Conference/proceedings	2	1	1	5	10
Photos/images/slide collections		1		3	4
Video/Audio materials			1	2	3
Dissertations	4	1	2	11	18

Table 4.5. Researchers interest to contribute to DUO

It can be seen in the above table that out of 45 respondents 26 researchers responded to this question. Interestingly, more professors were very much interested in contributing dissertations than scholarly articles and conference proceedings. The least frequent type of materials to be contributed by the researchers was found to be video and audio materials. This might have been due to DUO not having a suitable technology for video and audio type of martial and most often much of scholarly research output are produced in text than in video and audio formats. However, even the number of respondents interested in submitting scholarly articles and conference proceeding documents is very small compared to the number of respondents, even though these types of materials were chosen most frequently by the respondents as interesting to contribute. Besides, research assistances were found to be more interested to contribute all types of materials to the university institutional repository though the university administrative law required them to submit their dissertation to DUO upon completion of their study.

4.5. Sources for Researchers IR awareness

Respondents who did say that they were aware of the Institutional repository were also asked to specify from where they have got this awareness. Out of 45 respondents 14 researchers responded to this question. Out of the 14 respondents five said they have got this awareness through publicity on a university/library website. One respondent said he has learned this awareness from publicity through campus newspaper, two persons said by contact from the IR and university staff members, and five researchers said the internet helped them to be aware of the institutional repository. Respondents were also asked to express with in their own words where did they got the IR concept. Two persons said they couldn't remember where they have found this awareness now and another professor responded that he did get this awareness from his friends and when he was delivering his master thesis to the University. The University of Oslo sources for providing IR awareness to the researchers were found in this survey to be very low. Only three out of 14 researchers said they have got this awareness from the university sources.

4.6. Researchers' Attitude to the IR

In order to know researchers' attitude to IR and DUO, respondents were asked some attitudinal and related questions and their responses are presented in the following sections**.**

4.6.1. Perception to free access

To know the respondents perception toward the institutional repository and free access to the scholarly research results of the University of Oslo one statement has been provided to the respondents to agree and disagree with. The result is presented in the following table.

Question	*Responses (n=45)*				
	Strongly agree	*agree*	*Neutral*	*disagree*	*strongly disagree*
Scholarly research results of Oslo University should be freely accessible through Institutional Repository	17	15	12	1	-

Table 4.6. Researchers' attitude to the IR

According to the above table, all 45 researchers have responded to the statement that scholarly research results of Oslo University should be freely accessible through Institutional Repository. From all respondents 17 researchers have said they strongly agree that research works of the university should be available on institutional repository, 15 respondents answered that they agreed with the statement. Most interestingly this table shows that more respondents have agreed that institutional repositories could be one of the methods for disseminating of research results. However, the one professor who disagreed with the statement was found to be not interested to contribute his work to DUO. The main reason for his disagreement and unwillingness to participate to DUO was described as follows, "There are too many publications channels already. We don't want yet another, without any substantial merit. Peer-reviewed, high-quality journals and book series are sufficient."

4.6.2. IR Perception and Researchers awareness

Scholarly research results of Oslo University should be freely accessible through Institutional Repository	Are you aware of IR concept		
	Yes	No	Total
Strongly agree	6	11	17
Agree	4	11	15
Neutral	4	8	12
Disagree		1	1
Total	14	31	45

Table 4.7. IR perception and Researchers awareness

To understand researchers' awareness and their attitude to free access the above table 4.7has been formulated. All the 45 researchers responded to both the awareness and perception questions. According to the above table 4.6 even if the majority of the researchers were found be unaware of the Institutional repository concept the perception to make open access of university of Oslo scholarly research result through the institutional repository have been found strong and positive. However, there has been also found that some of the researchers had neutral perception for free access through institutional repository and one profess who didn't have the awareness to IR was found disagreed to free access of scholarly research results. As it can be seen in the above table the majority of the researchers have said that they didn't have any knowledge of IR but they said they agreed in making the university research work freely accessible through the the university institutional repository, this might have been due to the reason that the researchers didn't have the clear picture of IR.

4.6.3. Respondents' Perception of IR and their Academic status

Academic status	Scholarly research results of Oslo University should be freely accessible through Institutional Repository (n=45)				
	strongly agree	Agree	Neutral	disagree	Total
Professor	6	4	2	1	13
Associate and Assistance professor (F*ørsteamanuensis)*	3	3	3		9
Research fellow (*Postdoktor)*	4	1	3		8
Research assistant (*Stipendiat)*	4	7	4		15
Total	17	15	12	1	45

Table 4.8. Researchers' attitude and academic status

In this survey it has also been attempted to find out the respondents' attitude according to their academic status. As the above table 4.8 shows that perception of the IR according to academic status is found to be equally distributed. This implies that academic status of researchers did not bring any difference in their awareness to the Institutional repository. However, some resistance had been shown in the professor

group where one of the professors disagreed with the statement whereas this resistance not shown in other academic status of the researchers. Moreover, the neutrality for the statement was also found to be in the same level. The degree of positivity to the statement is found to be strong in all academic status except the research assistant academic status. However, as the above table 4.8 shows that regardless of their academic status the majority (32) of the 45 researchers were found to have a positive attitude to make their research result freely disseminated through the university institutional repository.

4.6.4. Motivation of Content contribution to DUO

Motivation	Response by age group				Total (n=14)
	< 30	31-43	44-55	> 56	
Facilitates the coordination of interdisciplinary teaching and research efforts	1	6		3	10
Increase accessibility of my research work	2	7	2	3	14
Create publicity for my research work and impact on research community	2	5	3	2	12
It is one of my professional duties		4		5	9
I am told to contribute by the university administrator	1	3			4
Other, if any			1		1
Total					50*

Table 4.9. Respondents' motivation content contribution to DUO

Researchers who have responded that they were aware and interested in contributing content to DUO were also asked what motivated them to do so. According to their responses all the respondents were motivated because DUO Increase the accessibility

* *The total is greater than the number of respondents is because respondents were asked to choose more than one*

of their research works. Ten researchers responded that they were motivated because DUO facilitates the coordination of interdisciplinary teaching and research efforts in the University. Another motivating factor that encouraged 12 researchers to contribute content to DUO was because DUO would create publicity for their research work and impact on research community. Furthermore, nine researchers said that it is one of their professional duties to contribute content to DUO. Five out of nine who did say it is their professional duties were found to be in age group above 56 and the remaining four between 31 and 43. However, four researchers responded that they were motivated because they were told to contribute by the university administrator to DUO. One professor who answered for contributing to DUO as one of his professional stated his reason why he was motivated to contribute content to DUO as "scholarly articles in any field has to be submitted to the Institutional repository after it is published in a prestigious journals"

4.6.7. Reasons for not contributing

Respondents were also asked to specify their reasons that made them not willing to contribute content to University of Oslo Institutional repository. From the 45 respondents five found to be not interested to contribute their scholarly articles to DUO. According to their responses four out of five researches said DUO is a redundancy with other modes of disseminating information, two respondents answered that DUO was created only to disseminate student master thesis and dissertations, four out of five have said they had a problem of conflict with publishers polices, and another two out of five researchers responded that nature of their research work did not allowed them to publish on DUO (ex. co-authoring, versioning). Furthermore, all five respondents indicated lack of information to submit their research work to the University Institutional repository (DUO) and four of five researchers said that the additional time and effort required of them to perform self-archiving were their reason not to contribute to DUO. But only two out of five researchers gave lack of rewards from submission to DUO as their reason not to contribute. The result of this finding indicates that researchers before deciding not to contribute to DUO either did not consult the DUO website deeply or have not tried to

talk with the DUO staffs because all their concerns that made them not willing to contribute are already clearly presented on the DUO website.

4.7. Factors Affecting contribution to DUO

An Institutional Repository for University of Oslo (DUO) would be a valuable tool if it would					
Factors	Response (n=40)				
	very important	Important	moderately important	of little Importance	unimportant
Make preprint versions of my research available to a worldwide audience	10	7	8	5	10
Provide a way for me to create online peer-reviewed journals	4	7	10	7	12
show how many times in DUO my document has been viewed and downloaded	1	10	18	4	8
Count my contribution toward my tenure and promotion	2	10	9	9	10
Give recognition and reward from the University	3	15	10	5	6

Table 4.10. Factors affecting contribution to DUO

Respondents were given a short brief introduction about IR to read before answering this question. After reading the introduction respondents were asked to respond how the given factors are important to them to make University of Oslo Institutional repository a valuable information resource tool. Out of 45 researchers 40 responded to these questions. According to their responses the most important factor that would make DUO a valuable tool to disseminate scholarly research results was found to be if it can give recognition and reward from the University to the researchers upon submitting their work to DUO. Most importantly the majority of the researchers have also agreed that DUO would be a valuable tool if it would make preprint version of their research available to a worldwide audience as second factor. However, the majority of the respondents responded that DUO would be a valuable tool if it can count their contribution toward their tenure and promotion; while providing a way for them to create

online peer-reviewed journals were considered an unimportant factor. Moreover, the majority of researchers have also said that it is moderately important if DUO would show how many times in DUO their document has been viewed and downloaded as a content contribution affecting factor. This indicates that researchers might have been influenced by other online resources to take as important factor of creating online peer-review journal through DUO and they did not want to link their participation to DUO with their career development and promotion though the majority of the researchers did say that it is important if the university give recognition and reward upon submitting their work to DUO.

4.8. Researchers Expectation of DUO as IR

An institutional repository for University Of Oslo will					
Expectations	Responses (n=40)				
	Strongly agree	agree	Neutral	disagree	strongly disagree
Make available types of materials that have not been made available through the traditional publishing process, such as audio, video, and graphic images	6	17	13	2	2
Make my research available with very little effort on my part and without my having to maintain a website of my own	7	18	6	6	3
Provide long-term preservation of my digital research materials.	11	21	4	3	1
Make it easy for other people to search for and locate my work	11	19	7	1	2
Allow me to search the DUO for the most current research findings of my Institution	8	15	11	3	2
Make my research available faster than the traditional publishing process	4	14	14	5	3

Table 4.11. Respondents' expectation of DUO as IR

Respondents were also asked to agree or disagree with the expectation DUO will fulfill as the University of Oslo institutional repository. Their responses are presented in the above table 4.11. Out of 45 respondents 40 responded to these questions. The majority of the researchers agreed that their first expectation of DUO as an Institutional repository is that DUO provides long-term preservation of their digital research materials in the future. As their second expectation researchers agreed that if DUO can make it easy for other people to search for and locate their work, it would be a valuable tool for disseminating research results. Moreover, most researchers were also agreed that if DUO can make their research available with very little effort on their part and without their having to maintain a website of their own.

However, 14 researchers out of 40 were found to be neutral whether DUO would make their research available faster than the traditional publishing process and some researchers disagreed that making their research available with very little effort on their part and without their having to maintain a website of their own. Making available types of materials that have not been made available through the traditional publishing process, such as audio, video, and graphic images; and allow them to search the DUO for the most current research findings of their Institution were equally agreed by the respondents that these are the issue which has to be covered by DUO in the future. In general the majority of the researchers were found to agree with all the activities given to agree or disagree with in the questionnaires

4.9. Previous experience and future plan of self archiving

Responses	Have you had any previous experience contributing digital materials, such as digital photographs, images, data, and documents other than DUO?	Do you have any plan to contribute to the Oslo University Institutional Repository (DUO) in the future?
yes	**23**	**22**
No	**18**	**3**
Not decided		**20**

Table 4.12. Respondents' experience and Future plan of self archiving

To know researchers past experience and future plan of self archiving to the institutional repository two types of questions were asked. From 45 researchers 41 responded to the first question about their past experience and all the 45 responded to second question about their future plan. As it can bee seen in the above table 4.8 that 23 out of 41 responded that they did have and the rest 18 out of 41 said they didn't have any past experience of self archiving of their researchers work to the IR. However, according to their responses 22 out of 45 respondents were willing to contribute their work in the future, but three didn't have any plan and the rest 20 were said they have not decided yet to contribute their work in the future to the University of Oslo institutional repository. This indicates that their past experience of contributing articles to the institutional repository had some influence on their future plan to contribute.

A question of their preference of IR for submitting of their research work as opposed to through other channels was also asked to the 23 researchers who have said they had a pervious experience of self archiving. Out of 23 researchers 11 were found to be more interested in contributing their work to their personal webpage, another 11 researchers said that they were interested in contributing to their profession/research group’s open accessed website. Furthermore, eight out of 23 said they were interested in contributing content to subject repositories such as (arXiv.org, PubMed, BioMed, IEEE Xplore, etc), five said to University/Department website and two researchers preferred to contribute to institutional repository but not to DUO

4.10. Concerns on Institutional Repository and Open access

Respondents were also asked to express their concerns with an open ended question if they have any with regard to institutional repository and open access concept. Out of 45 researchers 11 responded with their concerns. Thus, by grouping similar responses it has been found that out of 11 researchers' three professors were concerned about the time DUO is taking. From these professors one expressed his concern as contributing content to IR and DUO as "created too much work over my job". Another professor explained his concern as "I worry about the amount of time I will have to spend on using this system." The third professor in this regard expressed that "the university

administration is already taking too much time". Moreover, one professor of the 11 researchers expressed his concern on his part said open access will have a negative consequence in the confidential projects as "only in confidential project with industry partners." concerned him. Two of the 11 researchers were concerned about copyright issues. The associate professor said, "Most publications require the transfer of copyright, at least for prestigious publication channels." and a professor in his part stated his concern as "Other publishers, like for example the IEEE, might limit the possibilities to publish work on I.R. and Open access." However, one of the 11 researchers wrote he did not have any concern about Institutional repository and open access concept as "not really" but this professor was one of those who did not have the awareness for both the IR in general and to DUO in particular.

Furthermore, two of the 11 researchers expressed their concern as DUO is just a duplication of effort. The professor researcher said, "There are too many publications channels already. We don't want yet another, without any substantial merit. Peer-reviewed, high-quality journals and book series are sufficient." And the associate professor in this regard stated, "We have enough web-pages and stuff at the university, we don't need another layer of administrative web-pages. I upload my papers, talks at the FRIDA and for different projects here and there. Everyone makes up a web-page were I can (or must or should) upload my work to document it. I definitely not need another possibility to do it. My papers are available on the INTERNET anyway." One research assistant of the 11, on the other hand, stated that publishing research results into open access is expensive. He explained his concern as "Open access makes publishing too expensive (Springer wanted 2k €) if we wanted open access as opposed to standard access in a journal. This makes peer reviewed journal publishing impossible for many universities/researchers with open access."

Some of the respondents were also concerned about some technical problems of DUO. A professor stated that "DUO is not in the UiO main website, nor on the research page. That sort of secrecy of which should be open and accessible is incomprehensible. DUO is not updated. Master's and doctoral dissertations are not

posted systematically. Communication is especially important for them, since they are not electronically available in any other way. Until the University can keep up to date since, it is possibly the best that the database is kept secret." Moreover, another researcher has also said in this regard that DUO is not presented in a way researchers can use it. He stated that "Most of the times I'm seeing only blank pages on DUO"

Chapter Five

5.1. Discussion

Much of the literature and previous research makes it clear that researchers' decision to participate in contributing content to the institutional repository can be affected in many ways. Similarly, to participate in any work or activities, awareness about the environment how things are done and should be done is very crucial. It has been found in this survey study that the level of awareness of researchers to the institutional repository in general and about DUO in particular at the University of Oslo is very low. In this survey study it has been found that regardless of their age and academic status 31 out of 45 respondents have said that they didn't have any pre-knowledge of the institutional repository. Moreover, the level of awareness according to their academic status has also been found in this survey study to be lower in the academic status of assistant and associate professor (Universitetslektor) and research fellow (Postdoktor) . However, their level of awareness to institutional repository increases as their age increases. This indicates that the professors were more aware of the IR than the research fellow and research assistants. In the professors' academic status as the survey indicated that eight of the 13 professors didn't have any knowledge of institutional repository and seven from the nine associate and assistance professors have the same lack of awareness.

Despite their low level of awareness of the institutional repository the majority of the researchers were found to be interested to contribute their research work to the institutional repository. The survey found that 26 out of the 27 researchers who did have an awareness of institutional repository were interested to contribute content to DUO. However, In this regard the University of Oslo’s contribution towards creating the awareness among the university research communities was found to be very low. As the survey indicated that only five of the 14 researches said they have got IR awareness through publicity on a university/library website and all the five respondents who were not interested to contribute have also said lack of information how to contribute made them not to participate in contributing content to DUO. Moreover, from the 14

researchers five also said they did have this awareness from the internet by themselves.

Regardless of their lower level of awareness of IR the most interesting thing which has been found in this survey study was that researchers have shown a positive attitude to open access of University research result through the University of Oslo Institutional repository. It has been found in the survey that 32 of the 45 researches said they agreed or strongly agreed that scholarly research results of Oslo University should be freely accessible and 12 of the 45 respondents were neutral. However, 22 of the 32 agreed researchers were found to be unaware of Institutional repository. Moreover, regardless of academic status the attitude to open access was also found positive.

The majority of the researchers in this survey study were found to be motivated by the very nature of institutional repository. They said that they were motivated because DUO would increase accessibility of their research work, facilitates the coordination of interdisciplinary teaching and research efforts, creates publicity for their research work and impact on research community. But taking contribution to DUO as one of their professional duties were neglected by the majority of the researches. As the survey indicated only nine out of the 27 researchers accepted contributing articles to DUO as one of their professional duties. On the other hand the many researchers were not motivated by the instruction given from the university administrators. The survey study found out that only four of the 27 researchers reacted to the administrator's instructions. Moreover, that DUO is a redundant mode of information dissemination in competition with other methods, and lack of information to submit their research work to it were some of the major reasons identified in this survey for not contributing scholarly articles to DUO. Copyright issues, wrong perception of DUO as a student masters thesis and dissertation collection, requirement of additional time and effort over their work were also found some of contributing factor that affected their contribution effort to DUO.

Another major finding of this survey was, the majority of the researchers believed that DUO would be a valuable tool as one of the information dissemination modes of the University if it can make preprint versions of their research available to a worldwide

audience and give recognition and reward to researchers from the University upon their contribution. Moreover, trying to provide a way for creating online peer-reviewed journals, attempting to show how many times in DUO their document has been viewed or downloaded and counting their contribution toward their tenure and promotion were found important factors to be considered in the future. Furthermore, it has been identified that the majority of the researchers' perception of DUO as a long-term preservation tool of their digital research materials and a way of making it easy for other people to search for and locate their work were found to be strong. More importantly it has been agreed by most of the researchers that DUO could be a valuable tool for making available types of materials that have not been made available through the traditional publishing process, such as audio, video, and graphic images. Besides, by making their research available with very little effort on their part and without their having to maintain a website of their own, allow them to search the DUO for the most current research findings of their Institution, and make their research available faster than the traditional publishing process were found to be equally important by the researches.

It has been also found in this survey study that researchers past experience of depositing their research work influences their future plan of contribution to IR. The result of this survey showed that those who did have the past experience of self archiving said they will contribute in the future whereas some others were found to be not sure whether they will contribute to DUO in the future or not. Most interestingly, the majority of the researchers were found to be experienced in self archiving of their work to their personal web page and to their profession/research group open accessed website. Moreover, a few numbers of researches were found experienced in contributing to subject depositories such as (arXiv.org, PubMed, BioMed, IEEE Xplore, etc).

Some of the researchers in this survey have been found to be concerned about open access and institutional repository concepts. Their major concerns were having another mode of communication added over the existing ones mainly creates duplication of

effort and redundancy of work. Furthermore, University of Oslo Intuitional depository has created extra work and time taking efforts for them. Another concern found in this survey was the issue of copyright with publisher and submitting of confidential research project to open access depository. Moreover, DUO website was indentified as having very poor technical layout and functionality to be accessible by the researchers. A professor explained that "DUO is not in the UiO main website, nor on the research page" and another have also stated "Most of the times I am seeing only blank pages on DUO"

5.2. Conclusion

In conclusion as it has been identified in the survey study that most of the researchers found to have low awareness of the institutional repository, high interest in contributing contents to the University institutional repository and have positive attitude to make free access of their research results, therefore, the university of Oslo should have used this opportunity to make the university community aware of the IR. Moreover, most of the researchers were found not even familiar with the information posted on the DUO website. This may imply that either the researchers are ignorant of the the university library laws and regulations or were unable to go through the contribution policies posted on the DUO website,. because copyright, publications and publisher open access issues of researchers concerns were already addressed by the DUO website.

Moreover, the functionality of the DUO website was found by the researchers to be problematic. This will lead the researchers to feel bored to work on the website. However, as the researchers' interest to contribute to the university was found to be high and their attitude to make their research work free access is positive, by improving the website functionality and its usability more researchers would have been attracted to contribute their content to the University institutional repository. Besides, these days' simplicity and ease of use is required of the technology in order to save users time and attract more users to the services.

Even though the University of Oslo has given the opportunity to the researchers to contribute their research work to either FRIDA or DUO or to both, the researchers found this as a redundancy and duplication of effort. Therefore, to avoid researchers concern in this regard once the researchers submitted their work to one of the repository it would have been a good idea if the DUO or FRIDA people manage the rest of the job by themselves. Moreover, it would have been an opportunity to create standard metadata of the deposited scholarly research documents if this process is managed by the FRIDA or DUO system librarian after the first contribution of researchers. Otherwise, FRIDA and DUO people should find ways to work together for the common goal so that duplication of effort could be avoided.

As it has been seen in the survey study most of the researchers were motivated by the very nature of the institutional repository. However, the University of Oslo would have got more researchers to contribute to the University Institutional repositories by providing some incentives such as giving recognition of researchers' contribution to DUO, acknowledgment and appreciation letters to those who have been contributed much of their work to the University intuitional repository even though they have been paid for it. Moreover, as many researchers recommended that the best way to enforce researchers to contribute to the university institutional repository is by implementing contribution to the University institutional repository as an institutional mandate. By the same token University of Oslo should have implemented the contribution to DUO as one of the institutional mandate so that the negligence to contribute to the university institutional repository by some of the researchers could have been avoided.

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Appendix I

The Following questionnaire has been prepared at Oslo University College (HIO) to survey researchers attitude to the institutional repository (IR) for the partial fulfillment of International Master in Digital library Learning (DILL)

"An institutional repository (IR) is a web-based searchable database of scholarly material that has been created by faculty and other researchers." This material is collected, stored, and made web accessible by an institution or group of institutions to preserve scholarly communication in a digital environment across disciplines. Taking into consideration both privacy and intellectual property issues, content could include: working papers, pre-prints, or post-prints of articles, technical reports, course materials, data sets, and symposia proceedings.

Oslo University built its institutional repository (DUO-Digitale utgivelser ved UiO) and has started disseminating scholarly works through it since 2002. Researchers can also self-archive their work through FRIDA – when they register their work in FRIDA, they may also upload the file. The file is then imported to DUO.

As a Digital library learning student in Oslo University College I would like to explore how the Institutional repository of Oslo University (DUO) meets the university community needs, how important it is to the research activities in Oslo University and how the researches react to DUO and their participation in contributing their research work. Therefore, the following questionnaire is designed to investigate the researchers' attitude to the institutional repository. I kindly ask you to give your time and fill the questionnaire. Your input will have a meaningful contribution to my study. All responses will remain confidential.

1. What is your academic status in the University?

- ☐ Professor
- ☐ Associate professor (F*ørsteamanuensis)*
- ☐ Senior research fellow (*Førstelektor)*
- ☐ Assistant professor (*Universitetslektor)*
- ☐ Research fellow (*Postdoktor)*
- ☐ Research assistant (*Stipendiat)*

2. In which age group are you?

☐ < 30 ☐ 31-43 ☐ 44-55 ☐ > 56

3. Please specify your department ----------

4. Are you aware of the Institutional Repository (IR) concept?

Yes ☐ No ☐

5. If Yes for Q. No. 4, where did you get this awareness?

- ☐ Through publicity on a university/library web site
- ☐ Contact from an IR staff member
- ☐ Presentation by an IR staff member at a faculty/University meeting
- ☐ Publicity through campus newspapers
- ☐ The Internet helps me to get this awareness
- ☐ Participation in an initial meeting of the IR
- ☐ Other----------

6. What do you personally think with the following statement?

Scholarly research results of Oslo University should be freely accessible through Institutional Repository.

Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ strongly disagree ☐

7. Do have any awareness of the Oslo University Institutional Repository (DUO)?

Yes ☐ No ☐

8. If yes for Q. No. 7, were you been interested in contributing content to DUO?

Yes ☐ No ☐

9. If Yes, For Q. No. 8, what kinds of material were you been interested in contributing? (Indicate all that apply)

- ☐ Scholarly books
- ☐ Scholarly articles
- ☐ Technical papers
- ☐ Pre-prints/post prints
- ☐ Course materials
- ☐ Conference/proceedings
- ☐ Photos/images/ slide collections
- ☐ Video materials
- ☐ Audio materials
- ☐ Dissertations
- ☐ Other, if any?----------

10. If yes for Q. No. 8, reason that motivates you to contribute to DUO (select all that apply)

- ☐ Facilitates the coordination of interdisciplinary teaching and research efforts
- ☐ Increase accessibility of my research work
- ☐ Create publicity for my research work and impact on research community
- ☐ It is one of my professional duties
- ☐ I am told to contribute by the university administrators
- ☐ Other, if any ----------

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11. If No for Q. No. 8, your reason for not contributing is? (Select all that apply)

- ☐ dundancy with other mode of disseminating information
- ☐ Fearing for misuse of my work (ex. copyright, Plagiarism, infringement, etc)
- ☐ DUO is only to disseminate student master thesis and dissertations
- ☐ Conflict with publishers polices
- ☐ Nature of my research work is not allow me to publish on DUO (ex. co-authoring, versioning)
- ☐ Lack of information to submit my research work to the University Institutional repository (DUO)
- ☐ Lack of rewards on submission to DUO
- ☐ Additional time and effort required me to perform self-archiving
- ☐ any other ----------

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12. Do you have any plan to contribute to the Oslo University Institutional Repository (DUO) in the future?

Yes ☐ No ☐ Not decided ☐

13. Have you had any previous experience contributing digital materials, such as digital photographs, images, data, and documents other than DUO?

Yes ☐ No ☐

14. If yes for Q.13, where did you prefer to submit your research work?

- ☐ To Personal webpage
- ☐ To Subject repositories (arXive.org, PubMed, BioMed, etc)
- ☐ To Institutional Repository but not DUO
- ☐ To University/Department website
- ☐ To Profession/research group open accessed website
- ☐ Others ----------

15. Referring to the IR definition in the first page, How important are the following factors to you?

An Institutional Repository for University of Oslo (DUO) would be a valuable tool if it would *(very important =5, Important=4, moderately important=3, of little Importance=2, unimportant =1)*

5	*4*	*3*	*2*	*1*	
☐	☐	☐	☐	☐	Make preprint versions of my research available to a worldwide audience.
☐	☐	☐	☐	☐	Provide a way for me to create online peer-reviewed journals
☐	☐	☐	☐	☐	Show how many times in DUO my document has been viewed and downloaded
☐	☐	☐	☐	☐	Count my contribution toward my tenure and promotion
☐	☐	☐	☐	☐	Give recognition and reward from the University

16. How do you agree or disagree with the following Statements?

An institutional repository for University Of Oslo will

(Strongly agree= 5, agree=4, Neutral=3, disagree=2, strongly disagree =1)

5	4	3	2	1	
☐	☐	☐	☐	☐	Make available types of materials that have not been made available through the traditional publishing process, such as audio, video, and graphic images.
☐	☐	☐	☐	☐	Make my research available with very little effort on my part and without my having to maintain a website of my own
☐	☐	☐	☐	☐	Provide long-term preservation of my digital research materials.
☐	☐	☐	☐	☐	Make it easy for other people to search for and locate my work
☐	☐	☐	☐	☐	Allow me to search the DUO for the most current research findings of my Institution

☐ ☐ ☐ ☐ ☐ Make my research available faster than the traditional publishing process

17. Do you have any concerns with regard to Institutional repository and Open access concept? ---
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Thank you for your time in completing this survey!