TOWARDS A SUSTAINABLE OPEN ACCESS SCHOLARLY PUBLISHING MODEL IN THE SOUTH

AFRICAN CONTEXT

by

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"I declare that the Master's dissertation, which I hereby submit for the degree MIS (Publishing) at the University of Pretoria, is my own work and has not been previously submitted by me for a degree at another university."

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Signature: IM du Toit

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Date

Abstract

This thesis reports on a study towards a sustainable open access scholarly publishing model in South Africa. The researcher defined the traditional scholarly publishing model as a foundation for scholarly publishing workflows and processes and the continuation of the publishing workflow as a sustainable business model. This model is simplified in this study to allow for further discussion in the investigation of the various business models of scholarly publishing. The researcher conducted a literature study to identify and define business models used in open access scholarly publishing in the international context and also developed a set of factors contributing to sustainability in this environment. These factors were then used to evaluate and investigate typical examples of open access role players in the South African context, using a desk study and interviews documented as case studies of the various initiatives.

The researcher combined all these findings to make suggestions towards a sustainable open access scholarly publishing by identifying and exploring the various factors associated with open access models in South Africa, considering the roles of all the role players towards output of high quality research articles.

The study found that South African scholarly publishers find the shift from a traditional subscription model to an open access model difficult, because they are not addressing their new client segment and also not acknowledging their own expertise within the publishing cycle.The research also indicates that the approach of either subscription or open access hinders a sustainable open access publishing model, but that the publishing community should instead encourage an approach a publishing environment that allows for both of these models to exist and function. Open access should not replace the traditional model but instead, enhance it.

Acknowledgements

Dedication

I dedicate this study to Dr Douw Greeff: my friend, my boss, my mentor and an exceptional individual. This study would not have been possible without his enthusiasm and support.

We miss you every day.

As you always said: *"Geloof, hoop en liefde. En van die drie… is cash flow die belangrikste!".* So let's see how the cash flow works.

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List of acronyms

APC:	Article processing charges
ASSAf:	Academy of Science of South Africa
DHET:	Department of Higher Education and Training
DST:	Department of Science and Technology
DTI:	Department of Trade and Industry
SciELO:	Scientific Electronic Library Online

Chapter 1: Introduction to research study

This research study will investigate open access scholarly publishing, towards a sustainable open access publishing model in the South African scholarly environment. Scholarly publishing is a form of scholarly communication which can be defined as the system for disseminating scholarly work (Carnegie Mellon University, 2013). This includes the creation, transformation, dissemination and preservation of knowledge (Carnegie Mellon University, 2013; Harnard, 2006).

This study will focus on the publishing of academic research in scholarly journals. In the statement of purpose of the Cost of Knowledge initiative, a scholarly journal is said to have the following role in the research environment: dissemination of research and confirmation in the form of peer review and professional evaluation, thus achieving professional recognition for the content of the research (The Cost of Knowledge, 2012). The researcher will be evaluating and suggesting models that will ensure the continuation of scholarly research ouput in this form in an open access environment.

Chapter 1 lays the foundation for this study by introducing the context in which this investigation will take place as well as the background to the problem that created the need for this study to be undertaken.

1.1 Background to the study
1.1.1 The purpose of scholarly publishing

What is the purpose of scholarly publishing? Houghton, Rasmussen et al. (2009) believe that "[s]cholarly publishing plays a key role, as it is central to the efficiency of research and to the dissemination of research findings and diffusion of scientific and technical knowledge." Scholarly research publication can only fulfil this role if it can be deemed as trustworthy and legitimate (The International Working Group in Halliday, 2001) and according to Ware and Mabe (in Morris, Barnas et al., 2013) formal publication can therefore function as such an assurance by fulfilling the following roles:

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- Registration
- Dissemination
- Certification
- Archiving and preservation

This thesis will discuss these functions in detail in Chapter 3, but these are important to consider when querying what motivates researchers to publish their research in such a formal manner. In the earlier statement Houghton, et al. (2009) highlight the importance of the dissemination of research findings in order to contribute to new research. Figure 1.1 illustrates this concept as the research publication cycle:

Read research articles

Carry out research

Write and publish research articles
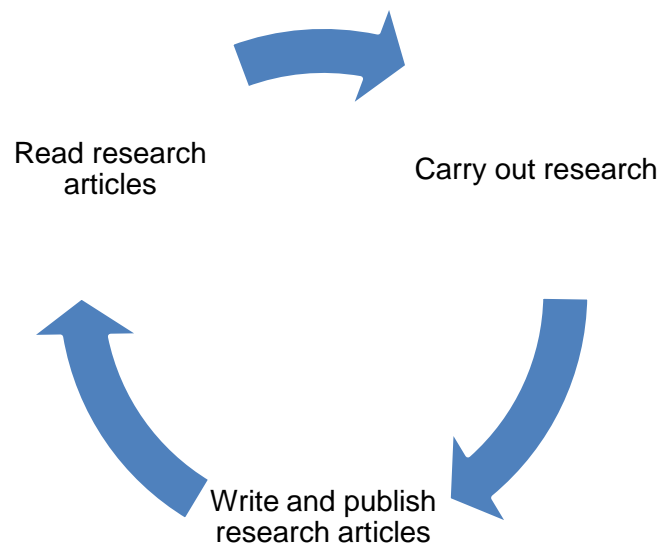
Figure 1.1 The research publication cycle (Morris, Barnas, LaFrenier and Reich, 2013)

This simple illustration indicates how one research article can stimulate discussion and contribute to a second research article (also see Hilf in Reisz, 2009; Mangiafico & Smith, 2014; McGuigan and Russel, 2008). The researcher refers to this cycle as continued research and will confirm that this flow of research is the main motivation for scholarly research publication, as it builds the academic reputation of the researcher as author (Mangiafico & Smith, 2014). Lende (2012) believes that research is driven by the discovery of new knowledge.

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Elements that drive this cycle to flow (as illustrated in Figure 1.1) are what motivate scholars to publish and include the communication of research in a reputable journal in order to contribute to the academic prestige of the scholar. These elements include the intention of the researcher to communicate research findings to his or her peers in a high-quality publication to increase academic prestige.

Brantley (2013a, b) indicates that the roots of scholarly publication are the rapid communication of research results to a research community. Traditionally, the only way for researchers to see their work disseminated or communicated to their peers in the scholarly community, was that it had to be published by a publisher (Mangiafico & Smith, 2014; Withey et al., 2011). Morris, Barnas et al. (2013) state that article publication is how the author is connected with the reader and "provide[s] readers with easy access to relevant research in their field".

A high emphasis is therefore placed on the importance of the quality of the research output of a specific journal (Kennan & Kautz, 2007; Peters, 2007). This quality is established by evaluation offered by peer review and the value contribution of the scholarly publishing process.

Perciali and Edlin (2008) aptly indicate that peer review is necessary to identify and improve the best articles for a specific journal. This is not a process that can be excluded if you wish to publish a high quality article and make relevant research available to the intended reader (Albert, 2006; Mangiafico & Smith, 2014; Perciali & Edlin, 2008; Reisz, 2009). The publishing process in turn also contributes to the quality of the article through layout and production as well as editing and proof reading through the trained eye of an experienced copy editor (Dobbs, 2012; Houghton, et al. & Oppenheim, et al., 2009; Reisz, 2009; The Cost of Knowledge; 2012).

Scholarly publication through a high quality, trustworthy journal is a way to achieve professional recognition (Albert, 2006; Cost of Knowledge, 2012; Esposito, 2013a,c; Marar, 2013; McGuigan and Russell, 2008; The Economist, 2012). According to Björk (2013) authors are driven by the prestige associated with a journal which in turn contributes to advancing their academic careers. Some researchers believe that impact factors are also a measure of research quality (Albert, 2006; Björk, 2013; Kurtz

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& Brody, 2006; Mangiafico & Smith, 2014; Morris, Barnas et al., 2013; Swan in Reisz, 2009). Scholars must also actively participate in scholarly research by not only producing but also consuming peer-reviewed journal articles (McGuigan & Russell, 2008; Nature Publishing Group, 2011).

This thesis will therefore consider the scholarly publication process as a cycle motivated by the above-mentioned factors that can only continue if research output that contributes to further research is of a high standard.

Open access publishing was founded on making research available to all peers at the time of publication in order to support these factors mentioned above. When thus considering the motivations behind scholarly publishing towards continued research, the open access availablity of research articles does make a lot of sense. This thesis will demonstrate that the focus on quality in this scholarly publishing cycle becomes even more important in an environment where the reader can freely access research.

Use of these high quality articles will only be considered by scholars if the research made available to them is relevant to their field of interest. Scholars may thus also be motivated to publish in a specific field, to a specific group of peers in order to contribute to that specific community (i.e. regional publishing).

1.1.2 International promotion of South African scholarly research vs. regional importance of scholarly publishing

Section 1.1.1 indicated that the purpose of scholarly publishing was for continued publication for which one of the motivating factors is recognition and prestige for the scholar within the academic reward system.

In her blog, Gray indicates that an active role should be taken by authors in the promotion of South African research through open access. She reminds scholars of the motivation behind scholarly publishing:

In a South African university sector which is driven by recognition based on journal articles and in which there tends to be a handful of public intellectuals who convey the broader results of scientific research to the government and the public, we could do worse than engage […] with the potential that we have in a technological age to open up the whole of the research process, making for the maximum usage of the research that is produced. This is of vital importance in the African research environment, where failures in effective communication means that we are constantly reinventing the wheel with frighteningly scarce resources.

(Gray, 2011).

Scholarly publishing is therefore of importance, not only for a global research community but sometimes for a very specific regional community, where a specific region benefits from important research that may not be of value to the global research community. Important research findings should therefore not be communicated solely on a global scale for the sake of wide dissemination but primarily to the research community that they serve and to which they are important.

The South African scholarly publishing environment has various interest groups. When looking at the governing bodies and policy makers involved in research publication in South Africa they are concerned with both important research done within South Africa that can contribute to socio economic development (i.e. regional publishing) and also scholarly research that is published on an international platform that promotes the country's status (Baker, 2008; Gray, 2009; Gray, 2011). These governing bodies and policy makers include the Department of Science and Technology (DST), the Department of Trade and Industry (DTI), the Department of Higher Education and Training (DHET), the National Research Foundation (NRF), the Academy of Science of South Africa (*ASSAf*) and the various academic research institutions (Baker, 2008; Gray, 2009). Each of these entities have their own mandates, policies and degrees of involvement with regard to scholarly publishing and also open access scholarly publishing. Policies that were stipulated by the South African government with regard to research publication, were drafted in the early 1990s, shortly after the demise of apartheid and focussed on the transformation of higher education. These are therefore

both dated and also concerned with issues of a very different time. They also do not address technological advances (Gray, 2009).

In a country where scholarly research publication is important for both the socio-economic development (thus locally) as well as the promotion of the country's status internationally, a more open flow of high quality research articles does make sense. According to Ondari-Okemwa (2007) the "free flow of ideas and information is vital to the process of scientific inquiry, and in turn to the ability to address economic, environmental and social development issues". This statement emphasises the importance of regional research or research that is important and applicable to a specific research community (Abrahams, Burke & Mouton, 2009/2010; Gray, 2011; Guedon, 2014; Mitchell & Le Roux, 2011; Ondari-Okemwa, 2007).

Various researchers address the low scholarly publishing rate of sub-Saharan Africa (Abrahams, Burke & Mouton, 2009/2010; Gray, 2011; Mitchell & Le Roux, 2011; Ondari-Okemwa, 2007; Rotich, 2011). According to Gray (2011), technology offers new possibilities to Africa in order to communicate research to now reachable areas. She states that:

> [She is] interested in how we can break out of the models of scarce and expensive print resources, to the more abundant world of open and collaborative online communications. And, most particularly, how can we make this work for Africa, rather than relying on global communications traditions that are not geared to African needs.
>
> (Gray, 2011)

Gray touches upon an important notion here: That the circumstances of the scholarly publishing environment in South Africa and Africa have their own unique attributes. This unique environment also has many governing bodies and policy makers concerned with research publication, each with their own mandates and policies, and of course also unique interests. The fact that the various academic research institutions push their researchers to publish in accredited journals with higher impact, rather than contributing to the growth of South African publications (Abrahams, Burke & Mouton, 2009/2010; Baker, 2008) challenges this growth of relevant publications.

Dissemination of appropriate research to the intended research community is crucial for the research cycle to continue. Research publication should be directed and available to the intended reader which will ensure the ongoing flow of research. The electronic publishing environment allows for easier means of disseminating research articles. Content is therefore available from various platforms and not limited to a printed journal. It is this electronic environment, together with the motivation for continued research from existing research, that paved the way for open access scholarly publishing.

1.1.3 The sustainability of the open access scholarly publishing business model

Traditional scholarly publishing models produce challenges of their own which will be discussed in detail in Chapter 3 when investigating the traditional scholarly publishing model. It is however important to consider that this model serves the research community well in continuation of the research cycle (as illustrated in Figure 1.1). Open access scholarly publishing is founded on the processes established by the traditional scholarly publishing model.

According to Research and Markets (n.d.), open access provides "lawful free access to journal content online and funding its production through other models". Publishers or initiatives choosing an open access business model can therefore employ various methods to sustain their business. This thesis therefore explores the sustainability of these business models while still maintaining that the motivation behind scholarly publishing remains of equal importance in the open access environment (i.e. communication to peers via trustworthy publications towards the continuation of scholarly research output).

This study is undertaken to define, explore and evaluate the available open access business models used in the international scholarly publishing environment and establish whether these approaches are sustainable. By indentifying factors contributing to sustainability the researcher can evaluate existing initiatives in the

South African scholarly publishing environment and make suggestions towards a sustainable open access publishing model for scholarly research in this context.

This study is undertaken with the understanding that the purpose of scholarly publishing is supported by open access provided that the quality of the article is not compromised. The researcher also considers that the the opportunities provided by open access scholarly publishing address specific needs in the South African research environment. Open access can however not promote the South African research community if the business models are not sustainable. The purpose of this research will be discussed next.

1.2 Purpose of the research

This study will in essence explore how international open access scholarly publishing models are funded. Thus, I will ask the question: how do these models sustain themselves? The researcher will then apply these findings in the investigation of the South African context. The detailed approach will be explained in Chapter 2.

Section 1.1 discussed the importance of considering the South African open access scholarly publishing environment as one with unique attributes, needs and challenges. These include the political environment in which scholarly publishing and research policies are drafted; the various bodies associated with scolarly research and publication; the importance of regional publishing (to the advantage of the developing country) and also international publishing (to promote South African scholarly content) (Gray, 2009). This research study will suggest a sustainable business model for open access scholarly publishing in the South African context, with a specific focus on research publishing in academic journals.

This study aims to document the following:

- Map open access scholarly publishing models in the international context with regard to motivation, role players, specific examples and associated challenges.
- Define sustainability for open access scholarly publishing.
- Identify factors contributing to sustainability for open access scholarly publishing. This will allow the researcher to create a measurement model to evaluate and discuss specific initiatives according to a predefined list of topics.
- Investigate open access scholarly publishing models in the South African context with regard to motivation, role players, specific initiatives and challenges.
- Suggest a sustainable open access scholarly publishing model catering specifically for the South African context.

1.3 Research objectives

The overarching research objective of this study is to propose a sustainable publishing model for scholarly research publishing in the South African open access environment. To achieve this, the researcher had to ask and answer the following sub questions:

- What does the traditional scholarly publishing model look like in the international context?
- What are the open access scholarly publishing models used in the international context with regard to motivation for use, role players, specific examples and challenges encoutered?
- How can sustainability be defined in relation to open access scholarly publishing?
- What contributing factors can be identified for sustainability in open access scholarly publishing?
- Does the traditional scholarly publishing model in the South African context conform to the one defined in the international context?

- Which publishers or publications are examples representative of the various publishing models for open access that can be used to contextualise the South African open access publishing environment?
- To what extent are these initiatives sustainable?

The researcher will conduct a literature study, a desk study and also conduct in-depth interviews to answer all the above research questions and then suggest a sustainable open access scholarly publishing model within the South African context. The research methods will be discussed in more detail in Chapter 2.

1.4 Important definitions and concepts

For the purposes of this research study it is important to place a few specific concepts in context with regard to this research field:

A publishing business model
Altough Chapter 3 will define specific open access business models, an understanding of what a publishing business model is, is required. Crow states:

> *A business model describes the economic logic that sustains an enterprise. For the publisher of a peer-reviewed journal, it describes the journal's audiences, the unique value that the journal delivers to each of those audiences, the activities and resources required to create and deliver that value, and the market mechanisms by which the journal translates the value it delivers into income to sustain itself.*
>
> (Crow, 2009)

A business model is therefore the way in which a publisher generates its income to sustain its publishing processes together with the associated publishing activities (Hoole, 2011).

Scholarly publishing
According to a report published by JISC titled the *Economic implications of alternative scholarly publishing models* (Houghton, Rasmussen, Sheehan, Oppenheim, Morris,

Creaser, Greenwood, Summers and Gourley, 2009), scholarly publishing plays a key role in a knowledge economy and is central to the efficiency of research and the dissemination of research findings and diffusion of scientific and technical knowledge. This report classifies scholarly publishing in three groups namely subscription publishing, open access publishing and self-archiving (Houghton, et al., 2009). These various groupings will be explored and discussed later in this chapter.

According to Kennan and Kautz (2007) scholarly publishing is concerned with the distribution of peer-reviewed articles through journals and conference papers. They continue that for research to be distributed (or shared) it must be communicated, used, disseminated and developed within a scholarly community.

For the purposes of this research study the term "scholarly communication" is therefore concerned with the models of scholarly publication as defined above, in the form of scholarly publishing of peer-reviewed journal articles and conference papers.

Scholarly publishing environments that will be referred to in this study
This study aims to understand the whole scholarly publishing environment and will investigate these various scenarios:

- The traditional print subscription scholarly publishing environment

The traditional print subscription model is in its simplest form, where the reader or user pays for what he or she reads (Esposito, 2013a,c). These journals are distributed only in print format to individuals or institutions who pay a subscription to these titles. This environment will be explored in detail in the literature review documented in Chapter 3.

- The electronic subscription scholarly publishing environment

For the purposes of this study, it is also important to consider the "information provision change" (Kennan & Kautz, 2007) from printed journals to online and digital availability of journal articles. Kennan and Kautz refer to this change as an evolution of the traditional paradigm (2007). This environment will be explored in detail in the literature review documented in Chapter 3.

- The open access scholarly publishing environment

Open access is a model for the dissemination of scholarly literature that ensures rapid, free access over the Internet to those works that scholars have traditionally produced without expectation of payment (Joseph in Crow, 2009).

The Open Society Institute (2005) stipulates the following four criteria for open access publishing:

i)   Free and universal access to articles.

ii)   Articles can be used by anyone granted that the correct author information is cited.

iii)   The article is made available immediately, without embargo.

iv)   The article is deposited somewhere dedicated to its preservation.

Reisz (2009) sums the above up as follows: "Free, immediate and permanently available research results for all".

Crow pins this down to free and immediate online access to peer-reviewed journal literature (2009). According to Houghton et al. (2009) open access publishing is defined as access that is free of charge to readers and the other role players pay for the publication. Bailey (2006) terms open access publications as "royalty-free literature".

The International Working Group (in Halliday, 2001) makes an important distinction between informal communication and publication and qualifies publication as the following:

- *It must be publicly available.*
- *The relevant community must be made aware of its existence.*
- *A system for long-term access and retrieval must be in place.*
- *It must not be changed* [therefore it must be certified in some way].
- *It must not be removed.*
- *It must be unambiguously identified* [for example with a Digital Object Identifier].

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- *It must have a bibliographic record (metadata) containing certain minimal information.*
- *Archiving and long-term preservation must be provided for.*

(Halliday, 2001)

For the purposes of this study, open access scholarly publishing can therefore be defined as research content that is available continuously via the internet, without any restrictions or embargoes and is easily retrievable.

Open access scholarly publishing is broadly split into two different definitions:

- Green open access
- Gold open access

Green open access is defined as the secondary publishing of primary publications which are usually accessible only for a fee (Max Planck Society, 2010). An example of this is the self-archiving of an academic author's work in his or her institution's repository (Reisz, 2009).

Gold open access is defined as making publications accessible to the public free of charge in electronic form in line with open access requirements at the time of its initial publication (Max Planck Society, 2010). An example of this is the publication of a scholar's work in a completely open access journal (through for example, funding (Reisz, 2009)) .

A publishing ecosystem

The notion of a scholarly publishing ecosystem was coined in a report compiled by the AAUP (Association of American University Presses) Task Force (Withey et al., 2011). The *Merriam-Webster Online Dictionary* defines the term as the "complex of a community of organisms and its environment functioning as an ecological unit" (2013). The use of this term in reference to the scholarly publishing environment was found appropriate because it highlights the notion that the publishing environment is an interdependent one relying on the input of all the associated role players. The AAUP

Task Force's report (Withey et al., 2011) includes the following role players in this ecosystem: presses, authors, libraries, repository administrators, scholarly societies and funding agencies.

The AAUP Task Force (Withey et al., 2011) places great emphasis on the notion that the scholarly publishing ecosystem is an interdependent one and should be recognised as such by all role players. The report refers to "interconnected partners" when referring to all the associated role players. This report also highlights the means through which the various role players can collaborate within the scholarly publishing ecosystem. Examples mentioned are university presses with other institutions for co-publishing; with their own libraries for digital publishing projects; and then also instances where university presses outsource some of the publishing functions to others (Withey et al., 2011).

1.5 Value of the research

The researcher has done an extensive literature review and concluded that although various case studies have been done with reference to specific open access initiatives, very little information is available about open access in the South African context as a whole, while no formal research has been undertaken to map the existing environment or formulate a long-term sustainable publishing model.

This research study is therefore valuable because it will investigate the international open access scholarly publishing models as a basis of comparison, including examples of implementation.

The researcher will develop a simplified scholarly publishing model as a basis for the discussion of publishing workflows, which can be important for other research undertakings.

Due to the fact that the study is focussed on sustainability the researcher will use the international investigation to identify factors contributing to sustainability that will

function as an important structural element for discussion and evaluation of the initiatives discussed in the South African context.

By identifying open access initiatives that are influential in the South African context the researcher will provide a valuable evaluation of the existing South African situation with regard to open access scholarly publishing which is an important step in suggesting a sustainable open access scholarly publishing model.

1.6 Limitations and scope of the study

The previous section highlighted the value of the study within the research field, but the researcher also needs to acknowledge some limitations.

This research is focussed specifically on the open access scholarly publishing of research as journal articles. Other open access initiatives, such as book publishing, have been excluded from this study.

This study is not concerned with the impact of open access but instead with the implemented business models and how they can or cannot sustain open access scholarly publishing.

The researcher made use of purposive sampling and included initiatives and individuals identified in the South African context that conformed to a variation of the characteristics defined in the international context. The sample is therefore intended to be typical approaches to open access scholarly publishing. The study does not mention all the initiatives currently underway in the South African context and may not fully represent the whole environment.

The fact that the study is focussed on a sustainable publishing model for South Africa specifically, is also a limitation, but does offer opportunities for future research.
In order for the researcher to understand the whole scholarly publishing environment, resources were included that may now be out of date. The information included in the study is however still relevant. One therefore also needs to consider that as this study

is conducted, new developments may occur that influence the scholarly publishing environment and may therefore not be included in the study due to time constraints.

1.7 Division of chapters

The researcher used the research objectives formulated in section 1.3, to divide the chapters and structure them in a logical sequence in order to answer the research questions.

This chapter (Chapter 1) is the introduction to the study. Chapter 2 will motivate and describe the research methodologies implemented to answer the research questions. The discussion of the research study will start in Chapter 3 with the literature study of the international investigation of scholarly publishing. The South African context will be discussed in Chapter 4, where the researcher will document various case studies. Chapter 5 will be the concluding chapter.

The chapters of this study were planned and structured to answer the research questions in the following manner:

Chapter 3: Scholarly publishing models in the international context: a literature study

Chapter 3 will form the important foundation on which the rest of the study is structured. This chapter will address the majority of the research questions in order to esablish a point of reference and comparison when it comes to analysing, describing and discussing the South African scholarly publishing context later. This study investigates complicated workflows within an environment with many role players involved, and it is therefore important to use this literature review to summarise workflows and concepts in order to use these findings as a point of reference for the rest of the study.

The traditional scholarly publishing model will be defined and depicted in this chapter. The researcher will discuss the traditional print subscription publishing model as a basis for any subsequent publishing models. The publishing role players will be

identified. This section will then continue to explore how an electronic publishing environment enhances the traditional print subscription model. This initial investigation will identify limitations as well as positive attributes of these initial scholarly publishing models and the environments in which they exist.

An illustration of the workflow of the traditional scholarly publishing model as well as the enhancements offered by an electronic environment will be included in Chapter 3.

After a clearly conceptualised model of the traditional subscription scholarly publishing model has been depicted the researcher will investigate the open access scholarly publishing models as part of this existing electronic publishing environment. These models will be identified through the literature and defined according to motivation for use, the associated role players, specific examples of implementation as well as challenges towards implementation.

This section will therefore provide characteristics associated with each of the various publishing models, allowing not only for recognition and identification of South African examples but also for comparison of the existing business models. Chapter 3 will therefore allow the researcher to list the characteristics of and compare these business models.

This thesis is concerned with the sustainability of open access scholarly publishing and due to the complicated structure of the whole scholarly publishing process the various factors contributing to sustainability, as defined for the purposes of this research study, need to be identified. These factors will make up smaller parts of the whole process but are all important components of the process as a whole. These components will be identified through the literature review. The findings will be discussed in Chapter 3.

When reviewing and discussing the challenges of implemantation for any scholarly publishing business model one has to ask, how are these models sustaining themselves and even, are they sustainable? It is therefore important that the researcher defines the concept of sustainable scholarly publishing in terms of open access scholarly publishing. This will also be addressed in Chapter 3.

The identification of these factors will show the researcher which elements need to be investigated and evaluated when looking at the South African scholarly publishing environment. It will also provide a valuable structure for the continued discussion.

The literature study of the international scholarly publishing environment, as documented in Chapter 3, will provide the researcher with various important tools for the investigation of the South African scholarly publishing environment.

Chapter 4: Open access scholarly publishing in the South African context: an in-depth investigation of specific representative initiatives

To suggest a sustainable open access scholarly publishing model for the South African context, the researcher needs to understand the current open access scholarly publishing environment. As with the international investigation, the South African scholarly publishing environment follows a complex workflow and is an environment with many stakeholders and role players. By using the measures and models derived from Chapter 3's literature review the researcher will be able to identify specific initiatives in the South African context as examples of the open access scholarly publishing ecosystem. The researcher will combine a desk study with in-depth interviews to obtain an understanding of the business logic of the specific business model(s) chosen.

In Chapter 3 the researcher will contextualise the traditional subscription model by developing a simplified scholarly publishing model. In order to make sure that this simplified scholarly publishing model can be used as a foundation for discussion of the South African scholarly publishing context, the researcher will conduct a desk study to compare the workflows of the international and the South African scholarly publishing environments.

The researcher will make use of purposive sampling (which will be discussed later in the chapter) to make sure that publishers and initiatives that were identified can be seen as typical of the open access scholarly publishing models (as identified in Chapter 3).

By combining the knowledge gained from the separate initiatives the researcher will be able to analyse the scholarly publishing environment. This investigation will also identify challenges associated with open access scholarly publishing as well as the needs of the various role players in the open access scholarly publishing ecosystem. Chapter 4 will therefore include a discussion of findings in the investigation of specific initiatives. This enhanced understanding will allow the researcher to make suggestions towards a sustainable open access scholarly publishing model in the South African context.

Chapter 5: Summary and conclusion

Chapter 4 discussed the findings with regard to the investigation of the South African open access scholarly publishing environment. Chapter 5 will be the analysis of these findings, thus combining the tools developed in the exploration of the international scholarly publishing environment (Chapter 3) with the findings of the in-depth investigation of the specific open access role players in the South African context (Chapter 4) to identify specific sustainability factors that are workable in the South African scholarly publishing ecosystem. Challenges of implementation will thus also be identified.

Every chapter investigates specific research questions in order to suggest a sustainable open access scholarly publishing model for the South African context.

1.8 Conclusion

Chapter 1 illustrated the setting in which this research study takes place. It provided valuable background to the study and also briefly discussed the purpose of the research. The research objectives were listed. Definitions and concepts of importance were discussed in order to establish a common understanding for the rest of this thesis. The value of the research was discussed. The broad scope was defined and limitations were also acknowledged. The researcher provided an indication of how the chapters will be divided.

This chapter introduced the research undertaking and stated the research problem. It aimed to summarise the whole sequence of this investigation. It contextualised the research with regard to the background, purpose, objectives, value and outlined the structure of the report. It also defined and contextualised some important terms for the purposes of this study.

Chapter 2 will outline and discuss the methodology that will be followed in conducting this study.

Chapter 2: Research design and methodology

2.1 Introduction

Chapter 1 introduced this research study as a whole. This chapter will outline the research design and methodology that will be implemented to answer the research questions. Specific questions were formulated in Chapter 1 as objectives for this study towards a sustainable publishing model for open access scholarly publishing in the South African context. This chapter will illustrate how the structure of the report will be based on these research questions and also explore the research methods that will be utilised to investigate and answer these questions.

Chapter 2 will start by listing the research questions as the objectives of this study. It will then indicate the structure of the rest of this report by indicating which questions are addressed in every chapter, what research methodology is implemented to answer the questions and also what the intended outcomes are.

The chapter will then continue to discuss the qualitative research methods implemented for this research study. The sample identification and structure will also be discussed as well as the motivation behind and the structure of the interview.

The chapter will then motivate why the research design and methodology is reliable before concluding the chapter.

2.2 Research questions

The overarching objective of this research study is to suggest a sustainable open access scholarly publishing model in the South African context. The objectives defined to aid the researcher in this task are as follows:

- What does the traditional scholarly publishing model look like in the international context?

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- What are the open access scholarly publishing models used in the international context with regard to motivation for use, role players, specific examples and challenges encountered?

- How can sustainability be defined in relation to open access scholarly publishing?

- What contributing factors can be identified for sustainability in open access scholarly publishing?

- Does the traditional scholarly publishing model in the South African context conform to the one defined for the international context?

- Which publishers or publications are examples typical of the various publishing models for open access that can be used to contextualise the South Africa open access publishing environment?

- To what extent are these initiatives sustainable?

2.3 Research methods

2.3.1 The literature review

The method utilised for the international scholarly publishing investigation (as documented in Chapter 3), is a literature review. This method is defined as "an assessment of a body of research that addresses a research question" (Harvard Graduate School of Education, 2013). According to Badenhorst (2008) the literature review is where the researcher discusses how the research emerges from previous research. It entails an analytical process of reading, thinking, organising, analysing, identifying patterns and evaluating and creating a new text from these activities. Fink (2005) defines it as "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesising the existing body of completed and recorded work produced by researchers, scholars, and practitioners". RMIT University (2013) links to this definition by indicating that a literature review involves surveying and synthesising the gathered information, then a critical analysis and finally the presentation of the literature in an organised manner.

The purpose of a literature study, according to Mathews and Taylor (1998), is to broaden the horizons of the researcher and establish the need for the research. A literature review therefore establishes a sound theoretical framework for the subject area. It also assists the researcher in defining key terms and definitions (RMIT University, 2013).

In this study, the literature review's aim is to summarise the available literature in such a way that models and measures are produced to form the foundation of the investigation of the South African open access scholarly context. Open access scholarly publishing is currently a widely discussed and debated topic. The researcher has identified various types of literature available for the investigation of the international context. The researcher will start this endeavour by making use of WorldCat.org to find relevant books and articles published on the subject of scholarly publishing and open access scholarly publishing. This will give the researcher a broad understanding of the topic and allow her to identify reputable authors on the subject.

To write this thesis the researcher will consult various sources. These will include book chapters, journal articles, special reports, conference presentations, conference proceedings and papers, various publication committee guidelines and codes of practice, press releases, blog entries, transcribed interviews, webinars, editor forum meeting minutes and case studies. The researcher will also look at relevant websites (of publishers and open access initiatives). The researcher will make use of non-academic as well as academic sources to ensure a thorough understanding of not only the theory behind open access but also the everyday practices in open access scholarly publishing. This method is suited to the practical implementation that the study aims to suggest.

This broad investigation is necessary for a complete understanding of the international scholarly publishing environment. It is important to realise that the open access environment cannot be explored in isolation, as it forms part of the whole scholarly publishing ecosystem. Therefore the researcher will explore the traditional print subscription scholarly publishing model, the electronic subscription scholarly publishing model and then the open access scholarly publishing model.

The literature review will produce the following:

- A simplified scholarly publishing model with clearly defined role players.
- A summary of the open access models implemented in the international scholarly publishing environment (with regard to motivation for use, associated role players, challenges of implementation, characteristics and specific examples of implementation).
- Identified and clearly defined factors contributing to the sustainability of these open access scholarly publishing models.

These measures and models will aid the researcher in the systematic, contextual and structured investigation of the open access scholarly publishing ecosystem in South Africa. Such an understanding is necessary to identify challenges to implementation and success factors in order to suggest a sustainable open access scholarly publishing model for this country.

2.3.2 The sampling method in qualitative research

Due to the South African focus of this study, very little information exists and a literature review on its own will not provide the in-depth information required. The investigative nature of this research report therefore lends itself to a qualitative study. The literature review forms the foundation of this study (as discussed in the previous section). The researcher will need to form a complete understanding of the South African scholarly publishing environment in order to formulate a sustainable open access publishing model. The analytical nature of this investigation allows for the selection of a small sample.

Qualitative research is defined as being "concerned with collecting in-depth information asking questions such as: *why do you say that?* Samples tend to be smaller than that of quantitative projects that include much larger samples. Depth interviews or group discussions are two common methods used for collecting qualitative information" (Market Search World, 2011).

According to Oklahoma State University (2011) "[q]ualitative research is a generic term for investigative methodologies described as ethnographic, naturalistic, anthropological, field, or participant observer research. It emphasi[s]es the importance of looking at variables in the natural setting in which they are found. Interaction between variables is important. Detailed data is gathered through open-ended questions that provide direct quotations. The interviewer is an integral part of the investigation."

In Chapter 3 the researcher will identify and define the environments of open access scholarly publishing as well as the characteristics of the various open access scholarly publishing models. These clearly defined business models will allow the researcher to identify specific initiatives in the South African scholarly publishing environment. The intention is therefore not to make use of a representative sample.

This method of sampling is called purposive sampling and indicates that the researcher made strategic choices with regard to the research sample (Palys, 2009). The sample is therefore not a generalisable sample but comprises examples that are typical in the South African open access scholarly publishing environment. By including these business practices in the case studies the researcher will obtain a thorough understanding of open access models implemented and be able to suggest approaches towards a sustainable open access publishing model in the South African environment. This method of sampling also allows for similar studies to be conducted using the same methodology.

The research questions formulated to answer the research objectives of this study, allowed the researcher to create a solid foundation in the initial literature study (Chapter 3) and also formulate various measures and tools. These can be used with a smaller sample in order to gather rich data. This gathering of data will be done by compling case studies from each of the chosen initiatives through desk study and interviews. These methods will be discussed in more detail in the following section.

2.3.3 Case studies in qualitative research

The researcher identified specific publishers and initiatives according to a set of criteria for the purposes of investigating the South African open access scholarly publishing environment. The criteria for this selection will be documented in Chapter 3 and the sample will be tabled later in this chapter. The researcher made use of purposive sampling to select a small sample and therefore required in-depth information from each of the respondents included in the sample to formulate a case study for each of which the findings will then be analysed and discussed. The methods chosen for this in-depth data gathering are interviews combined with a desk study. The researcher chose to make use of case studies because the research objectives required in-depth understanding and analysis of complex workflows within an environment with many stakeholders and role players. The measures and tools derived from the literature study allowed the researcher a documented understanding of some of these complex workflows to use in the South African analysis, aid in discussion and comparison and allow the researcher to evaluate and measure the existing state of sustainability of open access scholarly publishing in South Africa.

The international investigation allowed the researcher to identify all the steps in the scholarly publishing process and also the various associated role players. The researcher will therefore need to identify open access initiatives and publications representative of all the associated role players and conduct in-depth interviews with these representatives. These interviews will allow the researcher to investigate the South African scholarly publishing environment in detail.

Due to the investigative nature of the research objectives linked to the scholarly publishing environment within the South African context, the researcher believes that in-depth interviews will be the method best suited to gathering the desired data. An interview is defined as: "A discussion between a reporter, host, panel, or audience and a newsmaker, author, or celebrity, recorded (edited or unedited) in print, on film or video, or as a sound recording. The format is one in which the *interviewer* poses formal questions to be answered by the *interviewee*" (Reitz, 2011). According to Harvard University's Department of Basic Education (2013) qualitative interviewing is the "process of gathering data by asking people questions".

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Guion, Diehl and McDonald (2013) indicate that "[i]n-depth interviews are most appropriate for situations in which you want to ask open-ended questions that elicit depth of information from relatively few people". These authors highlight the importance of the planning of the key questions, even though this method encourages conversation. New questions may flow from previous questions (Guion, Diehl & McDonald, 2013).

For the purposes of the study each interviewee identified will be an individual involved in the South African scholarly publishing environment. The interviewee will be a representative of an publisher or initiative involved in the South African open access scholarly publishing environment. The researcher will predefine these participants by including initiatives that are representative of each of the role player categories as identified in the scholarly publishing model (through the literature study). This is crucial for a thorough understanding of the scholarly publishing environment in the South African context. Table 2.1 is a summary of the publishers and initiatives included in the research.

Broad open-ended questions will be used with the aim of gathering rich data. By analysing these interviews the researcher will be able to define and contextualise the South African open access scholarly publishing model and consequently make recommendations towards a sustainable open access scholarly publishing model. The questions will be open-ended and formulated in such a way that a clear and thorough understanding of the South African open access scholarly publishing environment is achieved and documented. The researcher will make use of a structured interview schedule encouraging in-depth answers and further conversation. The interview will aim to understand the specific initiative or publication's workflow and structure. It will then continue to explore the factors of sustainability as identified in the international investigation, for this specific initiative or publication. Due to the fact that the interviewee was specifically selected for this study, the interview will also aim to obtain valuable insight, such as unique services provided by the publisher. The structure of the interview will also allow the researcher to contextualise the initiative of publication in the broader scholarly publishing environment.

These interviews will be written up in an interview schedule and supplied to the Faculty of Engineering, Built Environment and Information Technology's committee for research ethics and integrity by the researcher for approval before interviews commence. Interviewees will be informed about the nature of the study by the researcher (interviewer) and also the cover letter attached to the interview schedule. Interviewees will be assured that the information provided by them will be treated as confidential at all times and will only be used for the purposes of this research study. All associated publications will not link the name of the initiative or organisation to the data. In accordance to this, interviewees will sign informed consent forms that will be kept on file by the researcher.

These interviews will be conducted via a conversation, either face to face, via Skype or telephonically. The researcher will send the interviewees the interview schedule, the cover letter and the informed consent form before the interview is conducted. This will allow them to prepare in advance if required.

2.3.3.1 Publishers and initiatives included in the sample

The researcher identified scholarly journal publishers or initiatives involved in the South African scholarly publishing environment with specific reference to their influence and involvement in open access scholarly publishing. The researcher's aim in this identification was to focus on publishers or initiatives that represent the various role players in the scholarly publishing environment and by doing so create a complete picture of the South African scholarly publishing environment with regard to open access scholarly publishing.

It is important to remember that the purpose of this South African investigation is not so much to compare the initiatives but instead gain a more complete understanding of the South African scholarly publishing landscape with regard to open access journal publishing. It was therefore important to include an example of each of various types of open access publishers or initiatives who make use of various business models to publish their content. Thus, a purposive sample of publishers was made according to the different business models identified in Chapter 3.

Table 2.1 lists the publishers and publishing service providers identified for this investigation and includes the motivation for their inclusion.

Table 2.1 Summary of publishers and service providers included in the sample

Respondent	Motivation for inclusion	Associated publishing model
ASSAf	Included as a journal publisher as well as an authority on journal quality	Gold: Funded Aggregator of scholarly content through SciELO
Medpharm Publications	Publisher of specialist medical journals on behalf of medical academic societies	Commercial publisher offering gold OA: Hybrid publishing and advertiser pays publishing moving towards APCs
EE Publishers	Niche titles that take on the form of a more general magazine	Commercial publisher offering gold OA: Advertiser pays publishing
Litnet Akademies	Single journal offering publication in Afrikaans for various subject areas. Achieved accreditation before the first issue. Authors are paid for their contribution eventhough the journal does not earn a subscription income	Gold OA: Funded
Image & Text	A niche journal that has been publishing since 1992 with no obvious income stream	Gold OA: Institutional subsidy
Taylor & Francis South Africa in collaboration with NISC	Unique international involvement in the South African scholarly publishing environment. Most of the South African subscription publishers who have open access counterparts follow a hybrid model. *NISC* has embraced the T&F model offering authors an option. Even though all their own titles are still in printed format.	International commercial publisher offering collaboration options for South African scholarly publishers. Gold OA: APCs (initially paid by publisher) Hybrid: Subscription publishing offering an open access option

2.3.3.2 The structure of the interview

The researcher used tools formulated from the literature study to structure and compile an open-ended interview schedule (see Appendix A). The aim of this investigation is to gain understanding and insight into the South African scholarly publishing environment with regard to the open access scholarly publishing of journals rather than conducting a comparison of how sustainable the various initiatives are. The researcher combined these interviews with a desk study and in some cases had a more informal discussion to clarify answers after the findings of the desk study were already documented.

The interview schedule addressed the following topics:

- General background and publishing information
- The publishing process
- The audience and client segment
- Value proposition
- Core activities and resources of the publisher or initiative
- Distribution channels
- Income streams
- General comments

These will be discussed in detail for every respondent in Chapter 4.

2.3.4 Reliability of research methods

The research objectives set out for this thesis require the use of various data sources to confirm the findings made through triangulation. The researcher will conduct a literature study to document and create various models and measures, which will in turn be used for the foundation of the South African investigation. The investigation documented in Chapter 3 is a combination of various reliable literature sources combined into summaries of the findings. It will allow the researcher to define, characterise and depict complicated workflows and environments in a simple manner

and then use these as measures and tools for the case studies that will follow in the South African investigation.

These summaries will include a depiction of the traditional subscription publishing model and one of the enhancements offered by an electronic environment. These two models will allow the researcher to create a simplified scholarly publishing model. The validity of this model will be tested when offered to the respondents as an illustration similar to their own workflow.

The researcher will also use the literature to group, analyse and characterise the various open access scholarly publishing models used in the international scholarly publishing environment. This discussion can be summarised and will allow the researcher to identify specific models and initiatives in the South African context for investigation.

This thesis is specifically focussed on the sustainability of these models and the researcher will use the literature to define what sustainability means when used in the context of open access scholarly publishing. The investigation will also allow the researcher to identify factors contributing to the sustainability of open access scholarly publishing. The identification and definition of these factors will aid in the structure of the interview and the discussions that will follow for the South African scholarly publishing context. The South African context will be investigated through case studies of which the findings will also be used to ensure that the original models are reliable and valid.

These measures and models are all tools that can be used for associated or similar research studies. The researcher believes that this study can be duplicated in the investigation of other scholarly publishing environments. Some of these tools can also be used separately, depending on the specific research objectives.

2.4 Conclusion

This chapter outlined the research design and methodology that the researcher will employ to answer the research objectives defined for the development of a sustainable open access scholarly publishing model in the South African context.

It was indicated how the research report's chapter division and sequence support the exploratative nature of this research study and how it aids the researcher in answering the research objectives.

The chapter also discussed the qualitative research methods that will be employed to answer the research questions and explained the sampling method and also indicated who will be included in the sample. The motivation behind the research methods chosen was also discussed. The researcher also motivated why the research method, as described, is reliable and how the method together with measures and tools developed, can be used in other studies.

Chapter 3 will be the investigation of the international scholarly publishing environment.

Chapter 3: Scholarly publishing models in the international context: a literature study

3.1 Introduction

In this chapter the researcher will explore the scholarly publishing environment in the international context. This is an important component to include in the study towards a sustainable open access scholarly publishing model in the South African context, as it forms part of the existing foundation of the publishing ecosystem.

The researcher will define various scholarly publishing models by investigating the traditional subscription model (both print and digital methods) and the open access scholarly publishing environment. Literature sources will be used to investigate and discuss these publishing approaches and also the business logic, motivation for use, workflow and associated role players of each publishing model. Challenges associated with every approach will also be mentioned.

Although the focus of this study is open access scholarly publishing, the traditional scholarly publishing model remains the foundation of all scholarly publishing approaches. These two broad models form part of the same publishing environment. Therefore an in-depth understanding of both is required to identify the factors contributing to sustainability of the open access scholarly publishing model.

Chapter 3 also includes an analysis of the sustainability factors that will be used as a model for discussion and measurement tool for the initiatives that will be investigated within the South African open access scholarly publishing environment.

The aim of this chapter is therefore to contextualise the scholarly publishing environment and identify factors contributing to sustainability in said environment that will serve as a foundation for the rest of the investigation of the South African open access scholarly publishing context.

3.2 The traditional print subscription scholarly publishing model

3.2.1 Defining the traditional print subscription scholarly publishing model

The traditional print subscription model is, in its simplest form, where the reader or user pays for what he or she reads (Esposito, 2013a,c). Harnard (2006) describes the research and publication process as a "worldwide, collaborative, cumulative and self-corrective cycle of publishing, accessing, and using research findings in order to generate further findings, applications and publications" (in Kennan & Kautz, 2007). Houghton et al. (2009) describe the traditional publishing model as one that imposes reader access charges and use restrictions.

Kennan and Kautz (2007) suggest the following as a traditional scholarly publishing model:
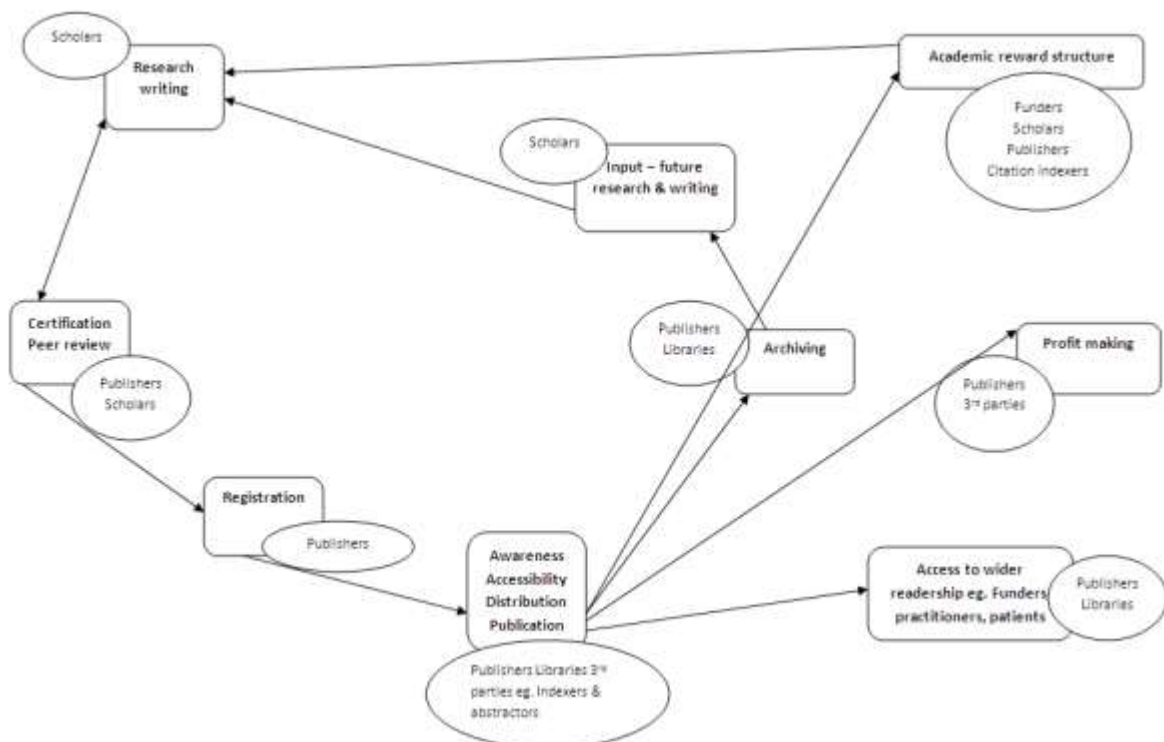
Figure 3.1 Conceptual model of traditional scholarly publishing (adapted by researcher from Kennan & Kautz, 2007).

"Scholarly publishing is a cycle that roughly starts with research and writing, moves through certification and peer review to registration on publication. Once the work has

been published it is made available to readers via publishers' subscriptions, libraries and third parties (such as indexing and abstracting services). Once available it is […] used by fellow researchers to feed back into the research and writing cycle" (Kennan & Kautz, 2007). Lende (2012) indicates that research is driven by the discovery of new knowledge.

The main functions of the traditional print scholarly publishing model are:

- Editing and review – this entails the quality control aspects assessing the value and significance and also making sure that the article is logical and of a high quality.

- Publication and distribution – making the print versions of research articles available to those who need access to them.

- Credit/reputation – ensuring that the researchers/authors get credit for their work.

- Archiving – making the work available for future researchers.

<p align="right">(Dobbs, 2012).</p>

The traditional print subscription model is one that is still widely used in the scholarly publishing environment and in many cases still answering some of the needs of the research community. This model does however have associated challenges which will be discussed in the next section.

3.2.2 Challenges associated with the traditional print subscription scholarly publishing model

3.2.2.1 The serials crisis and high cost of the publishing process

The costs associated with accessing scholarly research articles are becoming higher and higher (Kennan & Kautz, 2007; Mangiafico & Smith, 2014; Peters, 2007; Perciali & Edlin, 2008; Reisz, 2009; The Economist, 2012; Townsend, 2003). These costs take on many forms, some of which are included in Table 3.1 to illustrate this concept. This table does not include all the associated costs of the traditional publishing model.

Table 3.1 Examples of costs associated with the traditional publishing model (Morris, Barnas et al., 2013)

Costs for the publisher	Costs to the subscriber	Costs for the researcher as author (or institution of researcher as author)
Obtaining content for publication	Journal subscription	Journal subscription
Preparing content for publication	"Big deal" agreements	Rights and permissions
Printing	Pay per view	Submission charges
Distribution and storage of publication		Page charges
Sales and marketing		Research grants

According to Bosch, Henderson and Klusendorf (2011) "the economy drives any decision on serial pricing" and therefore the research community with regard to publishers and subscribers (which are mainly academic libraries) is still feeling the repercussions of the economic recession. Bosch et al. (2011) mention that library budget cuts occur in the same economic climate as the hike of subscription prices which makes it a problematic situation for both publishers and libraries. Another associated problem is that journal subscription prices vary. This is due to the fact that high profile journals that are in high demand can charge a higher price, and also that specific titles are sometimes used to subsidise other titles on the publisher list (King, 2007). Consequently, not all research institutions can afford access to all the available publications and what should be a distribution model, is now actually a barrier to researchers with regard to continued research. This phenomenon is known as the "serials crisis" (Bosch et al., 2011; McGuigan & Russel, 2008; Nature Publishing Group, 2011; Terry & Kiley, 2006). This "crisis" refers to researchers having difficulty in accessing the specialised literature that they need (Bailey, 2006) due to the fact that academic libraries cannot subscribe to expensive periodicals (Bosch et al., 2011).

The output of research articles is growing annually and institutions cannot afford to make all of these available to their researchers if these articles are only published in subscription journals (Bosch et al., 2011; Waltham, 2006). The traditional publishing model therefore creates a funding dilemma for higher education institutions (Waltham,

2006). Open access business or publishing models continue to be widely promoted and advocated within the scholarly publishing community as a solution to the access problem to relevant research and also the funding problem when it comes to the communication of research (Waltham, 2006).

The serials crisis refers to the subscription model, either for printed or digital access to research articles. Open access however has a similar challenge when the costs of submitting the articles (article processing charges or APCs) are investigated. This will be discussed later in this chapter.

Peters (2007) also makes a valuable point when indicating that the traditional scholarly publishing model is unbalanced because those who carry the cost of the scholarly publishing system (the libraries) are not those who benefit from scholarly publishing (i.e. the researchers). This is imbalanced because the researchers (or authors) control the journals (by choosing where they should submit) but libraries are the ones who carry the costs (Peters, 2007), as they are responsible for paying the subscription fees. Due to the serials crisis (as explained above) the library is therefore not in a position where they can subscribe to everything that their patrons need.

The size of the publisher in the scholarly publishing environment's traditional (subscription) model also determines its ability to compete (Peters, 2007), thus giving the larger publishers a significant advantage. This is due to the fact that the bigger publishers can offer subscription bundles and other options to libraries (Reisz, 2009). These publishers do however have this bargaining power, because they produce such high quality titles, and have the infrastructure to assure this quality (Esposito, 2013a).

3.2.2.2 Slow flow of research publication

The traditional print publishing model also offers a publishing process that has a slow turnaround time (Perciali & Edlin, 2008). This delay is caused by the lengthy peer-review process, delays associated with the production of the journal and the publication frequency of the journal sometimes causes relevant research to be put on hold (Perciali & Edlin, 2008). Mangiafico and Smith (2014) indicate that researchers want to share their research to "register the priority of their discoveries" and the fast dissemination thereof is therefore very important.

It is however true that the turnaround time of an article is not necessarily hastened by the digital publishing environment, but it does allow for articles to be published as they are ready, instead of having to wait for an issue.

3.2.2.3 Dependence on scarcity of content

For the print (and also digital) subscription environments to be viable and sustainable, journals need subscription payments. The subscription model is therefore dependent on a scarcity of content (Mangiafico & Smith, 2014). In a print environment the subject content is scarce and not necessarily accessible by those to whom it is relevant (for continued research), the content is therefore centralised (Esposito, 2013a,b and Withey et al., 2011). The IFLA statement on open access (2011) highlights that the output of research publications is rapidly growing (with regard to the number of articles and journal titles) and cannot be accommodated in the traditional subscription model.

It is however important to consider that the traditional (subscription) scholarly publishing model has elements that determine its sustainability, and are worth protecting (Withey et al., 2011). The traditional print model has set high standards for peer review and production processes which cannot be denied (Mangiafico & Smith, 2014). The rest of this investigation will highlight these, in the evaluation of the various publishing environments (traditional print subscription publishing, digital subscription publishing and open access publishing).

3.3 The digital subscription scholarly publishing environment

For the purposes of this study, it is also important to consider the "information provision change" (Kennan & Kautz, 2007) from printed journals to online and digital availability of journal articles. Kennan and Kautz refer to this change as an evolution of the traditional paradigm (2007). Peters (2007) suggests that investments in a publisher's digital submission and review system, as well as their digital publishing platform provide value to the research community by improving the experience of all the role players in the scholarly publishing environment. Figure 3.2 illustrates the additional possibilities provided by a digital publishing environment.
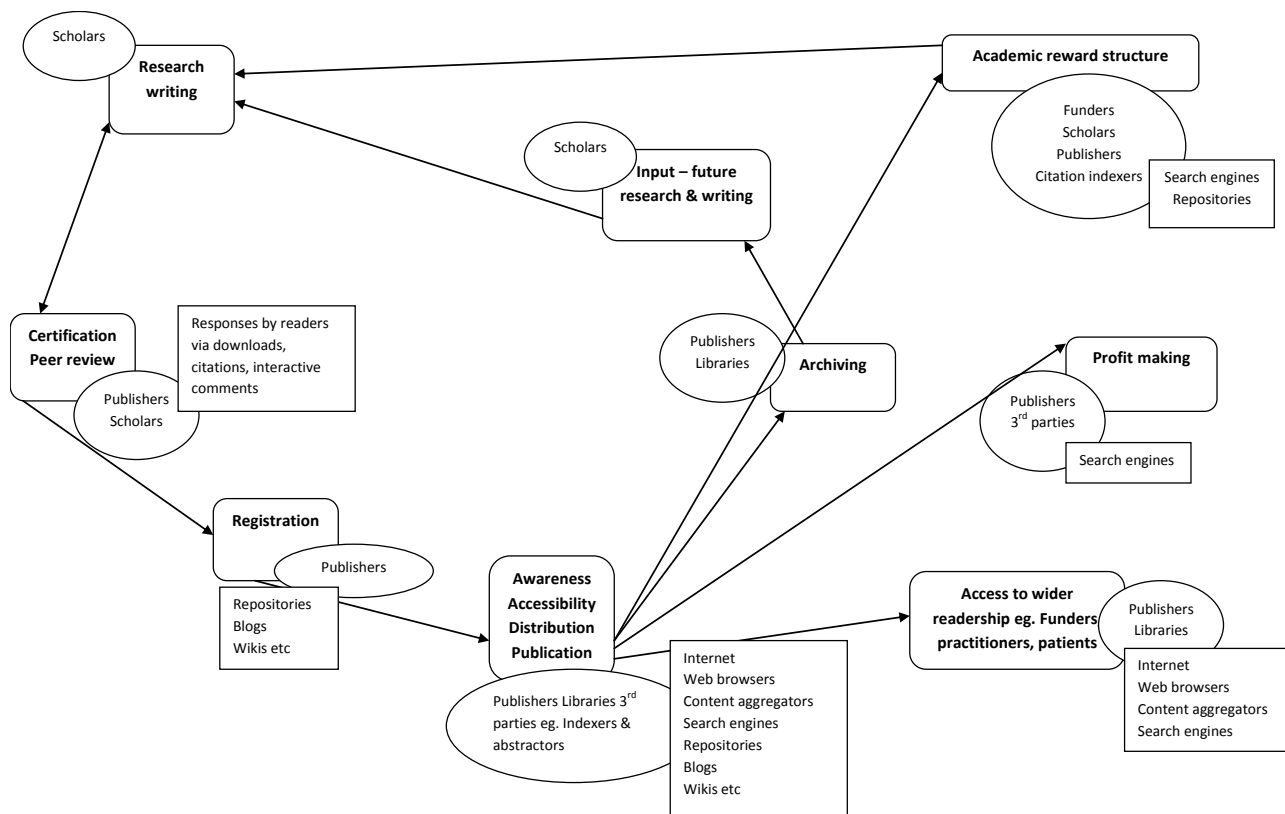
Figure 3.2 Conceptual model of the possibilities for publishing enabled by IT (adapted from Kannan & Kautz, 2007)

Kennan and Kautz (2007) illustrate with the above diagram that publishing in the digital environment is based on the traditional workflow and can therefore be seen as an enhancement of the structure that already exists. All the traditional roles are still in place (such as peer review) and the role players remain constant (Kennan & Kautz,

2007). The digital environment does however offer possibilities that were not available in the traditional print subscription model. These include:

- Research location by search engines.
- Digital submission.
- Various tracking options (of manuscripts and of the peer review process).
- Third party data vendors harvesting the metadata.
- Access to a wider readership (for example funders, practitioners and patients).
- Interactive environments where readers can comment on articles and the author can respond to these comments.

(Kennan & Kautz, 2007)

This diagram (Figure 3.2) therefore indicates that digital publishing processes have various impacts on the print process, that digital platforms have changed the means of dissemination of scholarly research and that because of this the expectation of the user (reader) has also changed. The following sections will explore the nature of these enhancements.

3.3.1 The impact of digital enhancements on the print process

The availability of digital resources in the publishing process allows publishers to, in fact, improve the traditional publishing process – a process that has been and in many cases still is serving the scholarly community well (Mangiafico & Smith, 2014; Perciali & Edlin, 2008; Theodorou, 2010) and of which the infrastructure already exists to build alternative publishing models on (Shieber, 2009). This is due to the fact that digital processes eliminate some of the issues and frustrations currently associated with the traditional publishing process which it is a time-consuming process, with a slow turnaround time, allows for limited access and has high cost implications (even when you only look at the physical production of a journal) (Perciali & Edlin, 2008). Processes such as peer-review management software considerably speed up the process. Perciali and Edlin (2008) defined various challenges associated with the turn-around time of research articles in the traditional publishing process that have all been solved with publishing in an digital environment.

This digital environment relies on two components for the publication of a scholarly journal, namely the manuscript submission and tracking system and the publishing delivery platform (Ware, 2007). In turn these can be integrated with other systems such as a subscription management system and external systems such as CrossRef and other bibliographic databases (Ware, 2007). This integration is possible due to digital workflows (such as XML) that cater for a much more agile publishing methodology (Maxwell & Fraser, 2010; Naughton, 2013). The digital environment allows the researcher to link resources together (Terry & Kiley, 2006; Naughton, 2013). These benefits associated with a digital publishing environment open up possibilities for alternative publishing models.

3.3.2 Digital platforms changing the traditional means of dissemination

An important development in scholarly publishing is the transformation from a hard copy, print-based system (where content was scarce and specifically located) to a digital environment where the content is not centralised and available in abundance (Esposito, 2013a,b; Marar, 2013; Withey et al., 2011). The digital publishing environment also allows for easy access to subject experts and an interconnection that can foster discussion (Esposito, 2013a,b and Withey et al., 2011). This change provides for new opportunities for the dissemination of scholarly publications (Swan, 2006).

Swan (2006) indicates that the digital environment can be seen as a "driver of change" with regard to communication and dissemination and is therefore applicable when considering the advances in scholarly communication with regard to scholarly publishing. Esposito (2013a) and Marar (2013) emphasise the importance of the function of the publisher as a means of validation for research in this information-rich environment. Marar (2013) stresses that the dissemination role of the publisher (as in the print environment) is still very relevant, even if reference is now made to "platforms and meta-data more than printing presses".

It is important to consider that a complete transition to a digital environment has in most cases not yet occurred. According to the AAUP Task Force (Withey et al., 2011) the transformation from print to digital formats is the primary driver for change. Journal publishing has on the whole made this transition successfully while maintaining the longstanding successful and sustainable business model of subscription sales (Withey et al., 2011). There has however not yet been a complete transition (Esposito, 2013a,b,c and Swan, 2012).

Some researchers indicate that the serials crisis, as an example, is not so prominent in the digital environment due to improved modes of dissemination. Davis and Walters for example state that "recent studies provide little evidence to support the idea that there is a crisis in access to scholarly literature" (2011). They base this on the fact that high-profile academic researchers are affiliated with institutions that already make most of the required and important research materials available to their faculty and students. This statement indicates a change of expectation from the side of the reader or user.

When we look at the processes linked to the print publishing environment and the digital publishing environment, the role players are the same, but the roles of these players are however different in some cases. These evolved roles will be investigated indepth later in this chapter. The expectations of the user have also changed due to the possibilities offered by a digital environment causing the publisher to now address attention to not only the reader but also to the author (Esposito, 2013a,c). Mangiafico and Smith (2014) also state that in this digital environment it is very important to understand the whole workflow as well as the functions of every step, because where the point of payment for the subscription environment is in a single place a digital environment allows for inputs as well as payments at various points in the workflow.

3.3.3 The digital environment providing opportunities for open access scholarly publishing

It is therefore within an enhanced and digital environment, in which information is suddenly easily disseminated and in which the information is no longer so scarce (Mangiofico & Smith, 2014), that opportunities for new business models exist.

The investigation of the traditional scholarly publishing model in both the print and digital environment (as discussed above) indicates that these processes are founded on the same workflow. The researcher therefore developed a diagram indicating the simplified scholarly publishing model as a basis for discussion. This diagram is illustrated in Figure 3.3 and appears later in this chapter.

The above sections indicated that technological developments enhanced the traditional scholarly publishing workflow, offering the publisher as well as the user (reader) an environment which will allow for the open dissemination of research articles. Research can now be made available without the barriers in the traditional print subscription environment (Esposito, 2013a,b,c; Mangiofico & Smith, 2014; Marar, 2013). Publishers therefore need to consider that the reliance on scarcity of information to justify subscriptions is no longer applicable to the environment that they publish in and that in order for publishing business models to be sustainable some other financial input needs to enter the workflow at some stage.

The digital environment therefore paves the way to an open access scholarly environment where publishers and authors can consider alternative publishing models to produce high quality publications that do not put a bar on the dissemination of information to the reader. Section 3.4 will discuss open access scholarly publishing.

3.4 Open access scholarly publishing

After looking at the traditional subscription scholarly publishing environment first in the print format and then in the digital format, it has become clear that the digital or electronic environment creates opportunities for authors to become the publishers

(Esposito, 2013a). Esposito (2013a) makes the following simple distinction between subscription publishing and open access publishing: "[traditional subscription] publishing is a service for readers and open access a service for authors".

This section will highlight that the role of the publisher is still important even in an open access environment. Esposito (2013a,c) and Marar (2013) state that the filtering role of the publisher is even more important in this environment, due to the abundance of information available. It is attention of the reader that is now the scarce commodity (Esposito, 2013c; Marar, 2013).

3.4.1 Motivation for open access scholarly publishing

Chapter 1 discussed the motivation behind scholarly publishing as a whole. What then is the purpose of publishing scholarly research in an open access environment? Motivating factors include:

- Continued research
- Broader access to research
- Benefit to the research community
- Mandated open access

Hilf (in Reisz, 2009) suggests that the scholarly community should approach the scholarly publishing process from the very basis of science and research: available research findings for continued research. Hilf continues to state that if this motivation remains the foundation of the process all the other factors will fall in place as a support infrastructure for this goal. Esposito (2013a,c) states that open access may be the choice for publication simply because some researchers may have a desire to share their research with fellow researchers.

In Chapter 1 the researcher indicated that the research cycle relies on continued research for a publication to be sustained. It is therefore important to consider that the reader will in many instances become a future researcher, contributing research articles to this cycle. Esposito (2013a) states that open access scholarly publishing

can be seen as a service to authors (as opposed to the traditional subscription model that is a service to readers).

Authors may choose an open access environment for various reasons. One of these is for greater dissemination of their work (Berkley University, 2011; Crow, 2009, Esposito, 2013a; Kennan & Kautz, 2007). With the possibility of more readers, and potential authors having access to articles not only is there the potential for more research on a specific topic, but also for more citations, contributing to the prestige of the authors and their institutions (Adriaanse & Rensleigh, 2011). Increased usage can also lead to higher impact facors.

An open access environment promotes the rapid communication of research results (Albert, 2006, Brantley, 2013a; Esposito, 2013a; Kennan & Kautz, 2007; Mangiafico & Smith, 2014). This therefore allows for important research to be disseminated far more quickly than in the print environment where articles had to wait for the next issue to be published. This means that research is available to the research community faster and can therefore be used and implemented in the continuation of the research cycle in a more timely fashion.

A secondary benefit of open access publishing is that a backup copy of the original is available to the author of the research article (Esposito, 2013). This is referred to as archiving and is a very important function in the electronic environment. Publishing in the electronic environment does not only provide a platform where articles can be easily distributed but also one where changes can easily be made. The tracking of specific versions of research articles is therefore also very important.

Some authors may choose open access due to the conditions set by the funders of their research (Crow, 2009; Esposito, 2013c; Withey et al., 2011). This is what is referred to as mandated open access and occurs, for example, when a university or research institution signs a mandate to make all the research articles written by their faculty and students available in a research repository. In many cases this form of open access publishes the pre-press version of the article (the one that has not yet been through the publishing process). Mandated open access is therefore listed as a motivation here, but does in fact indicate that the author does not always have a choice

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in the matter. The reasoning behind an institution signing such a mandate is to make their research output more accessible and visible, which in turn is expected to contribute to the reputation of the institution, the faculty and also the individual authors.

Open access publishing is therefore a solution to many of the challenges associated with the traditional publishing model which include the high cost of the publishing process (of which many of the costs are allocated to the printing and distribution of the journal), the fact that information is not immediately available and that the information is scarce. It is however important to note at this point that even if open access means that an article is free to the reader, it does not mean that it is free to publish that article. Open access business models allow for the opportunity to receive financial income from alternative sources than the subscribers. Mangiafico and Smith (2014) indicate that this payment can now occur at any point of the publishing process and that is why a clear understanding of the process is needed to make sure that the same high quality publication is still made available and that the endeavour is sustainable.

The following section will define and discuss scholarly publishing models as they are defined in the literature. The objective of this analysis is to create a summary in which the characteristics of each model are listed in order for the researcher and also other researchers to easily identify specific open access business models.

3.5 Investigation of open access scholarly publishing models

The IFLA statement (2011) states that open access is a term used for a movement as well as a business model "whose goal is to provide free access and re-use of scientific knowledge in the form of research articles […]. Open access does that by shifting today's prevalent business models of after publication payment by subscribers to a funding model that does not charge readers or institutions for access" (IFLA, 2011). It can be seen as a "free to user" model (Crow, 2012).

Open access scholarly publishing initiatives have practical financial implications for publishers (including society and non-profit publishers) (Joseph in Crow, 2009). Cockerill (2006) indicates that the defining characteristic of an open access business

model is that "it should not depend on restricting access to the published research in order to recoup the inherent costs associated with publication". Lossius (2013) calls open access and open access publishing models the "complete re-imagination of the traditional pay-for-access models". This section will investigate what that "re-imagination" entails.

There are many business models that are compatible with open access publishing, i.e. many ways to cover the publishing costs in order for researchers (readers) to reach the content (Suber, n.d.). Some models work better in some nations or even subject fields than others. Selecting the model suited to a particular publishing venture depends on various factors. According to Crow (2009) these factors are not only the financial implications but also the mission objectives of the publisher, its size, the business management resources and institutional or corporate affiliation, to name but a few. All of these factors will be defined and investigated thoroughly later in this chapter, when the researcher addresses factors contributing to sustainability.

Various researchers name two broad options for open access scholarly publishing namely gold open access in the form of journal publishing or green open access in the form of self-archiving (Awre, 2006; Bailey, 2006; Cockerill, 2006; Max Planck Society, 2010; Open Oasis, 2011; Peters, 2007; Reisz, 2009; Theodorou, 2010; Swan, 2006a,b).After a thorough investigation of the scholarly publishing industry in 2012, Swan suggests the following approaches to open access scholarly publishing (2012):

- Gold open access
- Fully green open access
- Green open access supplementing subscription access

The researcher found these groupings to be valuable in the exploration of the open access publishing models in scholarly journal publishing in the international context, as they are also grouped similarly by Sutton (in Reisz, 2009).

The following sections (3.5.1 to 3.5.3) will use the above groupings as the main categories and discuss open access publishing models that conform to the wide definition of each. These models will in each instance be defined and then discussed in accordance with motivation for use, associated role players, specific examples,

unique attributes (where applicable) and associated challenges. The researcher will also identify where another title or term is used for the same model in the literature. This discussion is structured as follows:

Table 3.2 Discussion structure of open access publishing models section

Gold open access scholarly publishing models	Fully green open access scholarly publishing models	Green open access supplementing subscription access publishing
• Author pays publishing • Advertiser pays publishing • Institutional subsidy • Community publishing • Institutional membership	• Self-archiving • Overlay publishing	• Hybrid (mixed model) publishing • Subscription publishing that offers an open access choice

3.5.1 Gold open access scholarly publishing models

Gold open access scholarly publishing entails the publication of all research articles in journals that make their content freely available (Swan, 2012). The Max Planck Society includes the requirement that these should be open and free at the time of publication (2010). It is important to remember that these costs then need to be covered in some other way (Crow, 2012; Swan, 2012). Cockerill (2006) indicates that a gold open access model should not depend on restricting access to content to finance the publication of the research. Funding for journals that fall within this model is obtained from institutions, grants or the research budgets of authors (Perciali & Edlin, 2008).

Publishing models that will be discussed in this section of open access publishing are community publishing, author pays publishing, advertiser pays publishing, institutional membership and institutional subsidy.

3.5.1.1 Author pays publishing

Author pays publishing relies on fees paid by the author of the research article, their institutions or research funders at the beginning of the publishing process (Open Oasis, 2011; Peters, 2007; Reisz, 2009). This model is sustainable if the community that derives value from the publication also has funds to support the publication thereof (Open Oasis, 2011; Peters, 2007). This model shifts the cost of publishing to a research cost rather than a library cost (Terry & Kiley, 2006). This model is applicable where reference is made to article processing charges or fees (Open Oasis, 2011). In most cases where mention is made of open access journals this model is being used (Bailey, 2006). Terry and Kiley refer to a funder pays model (2006). Some refer to a submission fee (Open Oasis, 2011), but this is paid before peer review, and will therefore be paid regardless of whether the article is accepted or declined.

The author pays model changes the role of the researcher as simply a contributor. The researcher now becomes a paying customer and the whole scholarly publishing process therefore becomes a service to this paying customer (Crow, 2007; Crow, 2012; Inger, 2014; Peters, 2007). The research mentions the following role players: author/researcher, end-user/reader (researcher 2), funder and affiliated institution (Cockerill, 2006; Halliday, 2001; Peters, 2007; Terry & Kiley, 2006).

The concept of article processing fees is not something that is foreign to most researchers as they and their institutions are familiar with paying page charges for some of the journals that they submit their work to (Cockerill, 2006).

The model requires a more service-oriented approach on behalf of the publisher thus answering directly to the needs of the author / researcher (Peters, 2007). Researchers / authors will therefore have a greater incentive to publish with a journal or publisher that offers a better service that is competitively priced (Peters, 2007). This model allows for smaller publishers to also create a sustainable business simply by providing the service needed by their target market (researcher / author) (also see Van Noorden, 2013). Smaller publishers also benefit from this model due to the fact that their bond with the research community is now the important factor and not the number of journals that they have (Peters, 2007).

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Funding initiatives for these models include the Compact for Open Access Publishing Equity (COPE) (http://www.oacompact.org/) (Reisz, 2009), BioMed Central (Bailey, 2006), PLoS Biology (Cockerill, 2006), Nature Publishing Group (Hoole, 2011) and IEEE Open (www.ieee.org).

Funds that are earmarked for submission charges or article processing charges (APCs) are not always applied to open access journals (Reisz, 2009). Library budgets can however be applied towards paying for (even if just partially) these article processing costs, but are not budgeted for as such. A re-appropriation is required (Shieber, 2009). Should the funds become available from an external funder this research funder may have specifications on what is made available and where. Also, they may only make research available that has been funded by them, thus limiting access to other applicable research (Houghton et al. & Oppenheim et al., 2009).

The belief also exists that with the charge of article processing fees, some journals are motivated to publish sub-standard research articles or work that has in truth not been peer reviewed (Jacobs, 2006). This conduct is referred to as "predatory publishing" (Beall, 2012) and will be discussed in section 3.7.

3.5.1.2 Advertiser pays publishing

The advertiser pays publishing model relies on a sponsor that will either place a regular advertisement in the publication or sponsor a special issue of the journal (Open Oasis, 2011). This model aims to attract sufficient advertising sales to generate a substantial portion of the total revenue (Morris, Barnas, et al., 2013). This is also known as sponsorship supported publishing (Open Oasis, 2011). The model is commonly used in fields where both practitioners and researchers read the journals (for example, in the medical sciences).

The main role players associated with this model are the publisher and the funder or advertiser (Open Oasis, 2011) but also all other role players in the publishing cycle (depending on what functions are performed for the publication).

Advertisers (funders) are motivated to opt in to advertise in a journal due to the fact that they know they will be communicating with their intended target audience (Crow, 2009). An example of such a title is *The British Medical Journal* (Open Oasis, 2011). Instances where specific institutions sponsor specific issues of journals have also been recorded.

Challenges associated with this model are that many journal titles cannot survive on advertising alone (Morris, et al., 2013; Open Oasis, 2011; Reisz, 2009), due to the fact that they cannot attract enough advertising to support their business without making use of other streams of income. Some fields may just not be suited to advertising income due to the fact that the market that the advertiser wishes to address are not the ones reading the publication or that some fields just do not have advertisements or are heavily regulated with regard to how they are allowed to advertise.

3.5.1.3 Institutional subsidy

This publishing model relies on the subsidy of the associated or sponsoring institution for the publishing activities (McGuigan & Russel, 2008; Van Noorden, 2013). This could for example be the support of the institution for a university press (Open Oasis, 2011). This model is especially effective where scholars wish to take control of the scholarly communication process (Open Oasis, 2011).

This model forms part of the models that Bailey categorises as "born open access" publishers (2006) meaning that they are open access from the first issue of publication. Cockerill refers to a directly funded journal (2006) and as indicated previously in this section, this can be seen as a form of community publishing (Open Oasis, 2011). Crow (2009) refers to donation publishing where the term donation can refer to money as well as infrastructure and expertise of the faculty, et cetera.

Role players directly involved in this form of open access publishing are the funder (society, foundation or research organisation) and the publisher (Cockerill, 2006). All other role players can also be involved depending on the functions fulfilled in the

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publishing process. The availability of the combination of resources for the publication is in most cases the motivation for applying this model.

Examples of implementation include instances where an institution formally subsidises journal publishing for example via the support of a university press or a publishing operation by a library (Open Oasis, 2011; SPARC, n.d). An example of this method is *Journal of Electronic Publishing (JEP)* that is published by MPublishing of the University of Michigan Library (Open Access Journal Directory, 2015).

Challenges associated with this form of open access publishing are that there may not be a clear indication of the costs involved in the publishing process, because the function forms part of the responsibilities of a staff member. The resources allocated to the publication may also be limited thus hindering the quality of the publication.

3.5.1.4 Community publishing

The term "research community" refers to the group of scholars concerned with the same research interest or interests. Community publishing can therefore be defined as a model that is commonly used by such research communities for journals in specialised areas of research (Open Oasis, 2011). Journals are produced entirely within the academy and the intention is to keep costs as low as possible. This is achieved by volunteer labour for the quality control functions such as copy editing and peer review (Open Oasis, 2011).

This is a variant of the institutional subsidy model (which will be discussed later in this section) (Open Oasis, 2011).

Role players identified in this publishing model come from the scholarly community who perform all the publication functions (Open Oasis, 2011),therefore, researchers, reviewers and the affiliated institution.

The model is very commonly used in small, niche areas of research (Open Oasis, 2011). It is a natural consequence of shared interest and the need to communicate

research to a very specific research community. For this form of publication, institutional facilities can be used (Open Oasis, 2011).

Examples of implementation include Frontiers (www.frontiers.org) who publish collections of research articles within specific fields. The Open Library of Humanities (www.openlibhums.org) was launched in 2013 and also conforms to the characteristics of a community that performs interactive community publishing.

Such a publishing endeavour relies on the availability of academics who are already taxed on their available time. The financial implications (risk) cannot be absorbed or spread over various titles, due to the specialised nature of the publications. To accurately communicate with the audience a platform is needed, which is not always available and that which is available caters for a more generic market.

3.5.1.5 Institutional membership

This model allows institutions to pay a lump sum annually in advance for articles that will be published by the faculty members and other researchers affiliated with that institution (Open Oasis, 2011). This model also forms part of the group termed by Bailey as "born open access publishers" (2006).

All the usual role players are associated with this form of open access publishing but specifically the research institutions, academic libraries and publishers.

The big commercial academic publishers can offer institutions very attractive packages to publish in their journals, especially when open access publication is mandated. Funders are also often attracted to the reputation of the commercial publisher. Some institutions also assign a special fund to make these publications possible for their researchers. Such an example is COPE (Compact for Open Access Publishing Equity) funds. Institutions have signed up for this initiative, pledging that they will make part of their library budgets available for researchers who wish to publish in an open access journal (Kleyn, 2014). These universities are however then bound to a specific publisher or publishing initiative for publication of research outputs.

The institution that signed up for such a membership receives a discounted APC rate for their affiliated researchers' approved articles.

Examples of such initiatives are BioMed Central and Hindawi Publishing Corporation (Open Oasis, 2011).

This publishing model is not something that a small publisher can offer because they do not have the variety of titles to offer publishing options to a large research institution. They can therefore not compete with the big commercial publishers within this environment (Open Oasis, 2011). This model also requires a re-appropriation of the library budget and fund management (Shieber, 2009) which is not always achieved, because in many cases the libraries pay these fees on top of the existing subscription fees making the expenses higher (Kleyn, 2014).

3.5.2 Fully green open access scholarly publishing models

Green open access publishing entails researchers (authors) self-archiving their articles in their institutional or subject repositories (Max Planck Society, 2010; Reisz, 2009). Ideally, this would be the final peer-reviewed version of the article (Reisz, 2009) but this is not always possible due to restrictions placed by some publishers on the content published in their journals. Suber (n.d.) indicates that the chief difference between gold and green open access is that open access journals (gold open access) conduct peer-review. When reference is made to "fully" green open access the researcher only refers to content which has undergone peer review and other quality control measures such as language editing. In most cases this will be the post-press version (Crow, 2012; Houghton et al. & Oppenheim et al., 2009; Swan, 2012). This will therefore also include options where the article is opened up for these quality control measures after submission to a repository.

One of the main challenges associated with green open access publishing is that, where the gold route offers a business model (publishing offered for a fee), the green route of self-archiving does not offer an obvious income. And papers that are self-archived may not always have the input of the quality control aspects that were

traditionally fulfilled by the publishers such as version control, language editing and correct formatting (Perciali & Edlin, 2008; Reisz, 2009). For the green route to produce high quality publication (that has had the input of a scholarly publisher or the scholarly publishing process) this would have to be an additional step in the process or an agreement would need to be made with the publishers to allow for the use of pre-press or even post-press articles.

Publishing models that will be discussed in this section of open access publishing are self-archiving and overlay publishing.

3.5.2.1 Self-archiving

Self-archiving is the "secondary digital publishing of primary publications which are usually accessible only for a fee. This secondary open access publications takes place in parallel with or after the original publication" (Max Planck Society, 2010). This self-archiving occurs in a digital repository which is a "managed, persistent way of making research, learning and teaching content with continuing value discoverable and accessible" (Bailey, 2006; JISC, 2010).

Bailey (2006) believes that self-publishing can also be a form of self-archiving. Pre-print publishing is also a term used in association with self-archiving (Casella & Calvi, 2010).

The role players in a self-archiving (green) model are publishers, authors (researchers) and institutions. These role players work together to ensure that copies of published articles are archived in the institutional repositories (Perciali & Edlin, 2008). Publishers with a self-archiving policy include the Nature Publishing Group (Hoole, 2011). This publisher even assists authors by providing them with the necessary tools to make this process as simple as possible.

Reisz (2009) indicates that the motivation for self-archiving can take many forms. One is discussed in his article *Learning to share* (2009) where he indicates that the motivation for scholarly communication (continued research) can be the motivating

force. He uses the example of Stephen Hicks who chose to make his work available because he received so many requests from fellow researchers for access. Self-archiving was therefore an activity that saved this researcher time, by giving him the opportunity to simply point these researchers to an institutional repository (Reisz, 2009). Berkley University (2012) states that articles submitted to a repository are available almost immediately. According to Björk (2013) one of the main motivations for self-archiving is self-interest (when looking at the academic reward system). This includes the promise of being more widely read and cited (Björk, 2013; Kurtz & Brody, 2006).

The main platforms on which self-archiving occurs are institutional repositories or discipline repositories (Awre, 2006; Berkley University, 2012; Reisz, 2009; Suber, n.d.; Swan, 2012). There are also now some social media sites like Academia.edu which allow researchers to submit and circulate their research articles.

According to Perciali and Edlin (2008), the participation of researchers with regard to self-archiving is still somewhat reluctant. This may be due to the fact that it is an additional workload for them or that they do not have the pre-press version of their article available to upload to a repository (in cases where the publisher is not willing to allow the author to use the post-press version of the article) (Olivier, 2011). Olivier (2012) agrees that the preferred version of the content to be deposited in a repository is the post-print, but highlights the problem that not all publishers allow this version. These authors can therefore submit their pre-print, but many authors do not keep this version (Olivier in Reisz, 2009). The fact that there is also not yet a standardised format in place for self-archiving also hinders the discoverability of the content (Bailey, 2006; Nature Publishing Group, 2011; Theodorou, 2010). Various researchers communicate the belief associated with repositories that there is no form of quality control (Waltman in Reisz, 2009; Houghton et al. & Oppenheim et al., 2009;Theodorou, 2010). Self-archiving is also challenged by the disinterest of the researcher to actually deposit his or her article. This happens often in cases where the researcher is affiliated to an institution where the institution offers access to all the research information needed by the researcher (Swan, 2006a,b). Another hurdle is that researchers are inclined to rather submit in an environment that is familiar to them (i.e. usually the same journal

titles are approached for publication). A repository may not be a familiar environment (Swan, 2006a,b).

3.5.2.2 Overlay publishing

Pre-print publishing offers an avenue for draft versions of articles (i.e. articles that have not been peer-reviewed). Binfield and Hoys (as quoted in Brantley, 2013a) are the founders of PeerJ who launched a preprint server in April 2013 – the main motivation for this being the rapid communication of research results. In adigital publishing environment the traditional scholarly publication becomes a "liquid publication" (Casella & Calvi, 2010) or an "agile publication" (Maxwell & Fraser, 2010) allowing for a more interactive scholarly publishing approach and which potentially dissolves the difference between the pre-print and post-print. A journal published in this model performs all the functions of a scholarly journal and relies on links with one or several archives or repositories to perform its activities (with regard to quality control) (Brown, 2010). This publishing model therefore allows for the submission of pre-prints and subjects them to peer-review (Brown, 2010; Suber, n.d.). The quality is therefore assured after submission and articles can be based in more than one repository or archive (RIOJA project, n.d.). Some researchers argue that overlay journals do not publish any original articles but select articles that exist elsewhere and offer a value-added publication to their users (Van de Sompel (2006) in Brown, 2010).

This publishing model therefore relies on an existing structure (such as an institutional repository) and builds a journal publication on top of that (Brown, 2010), in which the actual publication serves as the quality assurance of the content (as is the case with the traditional publishing model).

Overlay journals can be open access totally or in part (for example where the final version of the article is made available for a subscription fee) (Brown, 2010; Houghton et al. & Oppenheim et al. 2009). Overlay journal publishing is therefore a form of self-archiving but is distinguished from that in "its active participation in quality assurance [due to the fact that] it either offers peer review of its content or offers an additional

layer of quality assurance, based on relevance or significance" (Brown, 2010). These quality control mechanisms are applied to published pre-prints (Casella & Calvi, 2010).

This form of open access publishing therefore relies on an existing publishing structure together with an existing infrastructure (such as a repository) (Brown, 2010; Casella & Calvi, 2010; Houghton et al. & Oppenheim et al., 2009). One of the most important role players in this form of open access publishing is the repository, which can have various functions:

- Used for submissions and archiving of pre-prints.
- Hosting of the final version of the article.
- Being the basis of the journal's online presence.

(Brown, 2010)

It is therefore evident that a single repository can interact with various journals. The literature includes the following role players: repositories and repository managers, journal editors, publishers, researchers, readers and commercial publishers fulfilling various functions of the publishing process (Brown, 2010; Hendler in Brown, 2010; Swan, 2006a,b).

This form of publication is popular among some scholars due to the fact that there are various forms of quality control associated with the overlay journal (Brown, 2010). The very nature of scholarly communication in the form of scholarly publishing is the publication of research and the contribution that makes to continued research (as is evident in the scholarly publishing model).

Examples of such titles are the *Virtual Journals in Science and Technology* series (www.virtualjournals.org/vjs), *Current Cites* (lists.webjunction.org/currentcites/) (Brown, 2010) and arXiv, as well as the *Lund Virtual Medical Journal* (Casella & Calvi, 2010). The Development of the Repository Interface for Overlaid Journals Archive (RIOJA) toolkit (Casella & Calvi, 2010) also had this approach of open access publishing in mind. This project ran for a limited time (1 March 2007 to 30 June 2008) and investigated the overlay of quality assurance onto papers deposited in eprints

repositories. The project allowed for the development of APIs to set up journals in overlaid repositories through Open Journal Systems (OJS).

Due to the interactive nature of this form of open access publishing, various challenges to implementation are also evident. Overlay publishing relies on rigid version control which cannot always be implemented (Brown, 2010). This form of publishing is also by nature reliant on the active participation of all associated role players which may not always be achievable (Crow, 2012). As in the case of self-archiving, researchers may be reluctant to submit to an unfamiliar environment (Swan, 2006a,b).

3.5.3 Green open access supplementing subscription access publishing models

The use of open access through repositories to supplement access through subscription journals is a very common occurrence (Swan, 2012). Many journals make their content available in open access repositories, but continue making use of a subscription sales model (Swan, 2012).

Publishing models that will be discussed in this section of open access publishing are hybrid (mixed model) publishing and subscription publishing that offers an open access choice.

3.5.3.1 Hybrid (mixed model) publishing

The hybrid publishing model is where the publisher relies on revenue from the subscription-based publication to fund other publishing activities, which includes making available research articles in an open access format (Reisz, 2009). These can be whole journals published in an open access environment or subscription-based journals that make some of the articles available in an open access environment (Gardner, 2013; Max Planck Society, 2010; Morris, Barnas et al., 2013; Stutton in Reisz, 2009). Bailey (2006) refers to supplemental products which can refer to additional services within a subscription model context such as fulfilling the production functions of the articles.

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These publishers are mostly traditional scholarly publishers and therefore the role players are the same as for the traditional scholarly publishing model.

The Nature Publishing Group (Hoole, 2011) follows a hybrid model where high impact, high circulation journals still fall within a subscription model, and journals with lower paid circulation within an open access publishing model with article processing fees. They also actively support self-archiving of accepted articles even providing tools to assist authors in this regard (provided an embargo period is adhered to).

Examples of hybrid publishers include Hindawi Publishing Corporation (Bailey, 2006), The Public Library of Science (PLoS) (Bailey, 2006), Taylor & Francis Open Select (McMillan, 2011), Sage (Stutton in Reisz, 2009), IEEE (open.ieee.org) and Oxford University Press (Stutton in Reisz, 2009).

A challenge identified by Perciali and Edlin (2008) is that this form of open access publishing does not contribute to the motivation of lowering the subscription fee and instead places an additional charge over and above in the form of an APC which is most likely paid for by the institutional library.

3.5.3.2 Subscription publishing that offers an open access choice

Many commercial academic publishers offer an option where the subscription journals remain but authors (researchers) have the choice to offer their content in an open access model, at a fee (Reisz, 2009). Although this can be characterised as a form of hybrid publishing it is in most cases much more expensive to publish in this way than in any other author pays model.

These journals reside in a publishing environment where subscription-based titles are published. The role players are therefore the same as for this model which includes the researcher, reviewer, publisher, editor and host. These traditional publishers also have a sales force, which is excluded from other open access initiatives.

These journals all have the reputation of the publisher and title as validating factors. Researchers can therefore publish in an open access environment in a journal that is acknowledged within the traditional reward system of the scholarly community and also in most cases be funded for it due to this reputation, which other open access publishers or initiatives do not always offer.

Examples of such publishing programs include Springer's Open Choice Programme (Bailey, 2006). Taylor & Francis Open also offers researchers the option to either publish in an entirely open access journal (in many cases a new title) or publish in an existing Taylor & Francis title or titles published on behalf of scholarly societies (e.g. Royal Society of New Zealand and Human Sciences Research Council, South Africa) (McMillan, 2011). Wiley Blackwell (Stutton, 2009), Elsevier and IEEE also offer various open access publishing options.

Although all the journals published within this publishing model have a highly valued reputation associated with them, it is expensive to publish high quality research articles. These businesses are built on a subscription model and in most cases there are no full journals published open access but authors are allowed to publish single articles in an open access format for a fee. According to Stutton (in Reisz, 2009) this fee is usually much higher than the fee charged by a full open access publisher operating under an author pays model.

3.6 Challenges associated with open access scholarly publishing

According to Mercieca (2008) there is much debate about open access publishing. He, however, suggests that open access scholarly publishing is seen by many in the research community as a workable alternative to the traditional scholarly publishing model and should be considered as complementary to the traditional publishing model. Some challenges and concerns will be discussed below.

3.6.1 Quality concerns

Marar indicates that discovery of research is more and more dependent on the "credibility, authority, or expertise of the author" (2013). Some role players in the research community have concerns about the quality of open access articles. Weismann (in Reisz, 2009) indicates that the editorial process together with the peer review process are important quality indicators. She is specifically referring to the publication of pre-prints in repositories and states that "the accepted paper in a repository (or published online ahead of print) and the edited version the journal publishes will differ in important ways" (Weismann, 2009). These manuscripts may "contain errors and omissions" (Houghton, et al. & Oppenheim, et al., 2009).

Some researchers are also not convinced that peer-review is performed or that the quality of the peer-review that is performed is not of a high standard (Davis & Walters, 2011).

3.6.2 Dubious publishing practices

Beall (2012) refers to publishers who use open access publishing as a method to turn a profit as "predatory publishers". These publishers are motivated not only by sustaining an open access publication but by gaining from an open access publication whilst publishing poor quality journals (Basken, 2009; Beall, 2012), or no journals at all. Beall (2012) defines these publishers as follows:

> *[Publishers] that unprofessionally exploit the gold open-access model for their own profit. These publishers use deception to appear legitimate, entrapping researchers into submitting their work and then charging them to publish it. Some prey especially on junior faculty and graduate students, bombarding them with spam e-mail solicitations. Harvesting data from legitimate publishers' websites, they send personalised spam, enticing researchers by praising their earlier works and inviting them to submit a new manuscript. Many of these bogus publishers falsely claim to enforce stringent peer review, but it appears they routinely publish article manuscripts upon receipt of the author fee. Some*

have added names to their editorial boards without first getting permission from the scientists they list, among other unethical practices.

(Beall, 2012)

This method of publishing exploits the implementation of APC. Researchers pay the charges but very little to no quality control mechanisms are implemented by the publisher. A false front is therefore presented to potential researchers to encourage them to submit their papers.

3.6.3 Hesitation by authors/researchers

Shipp (in Jacobs, 2006) indicates that researchers are hesitant to contribute to an open access scholarly publishing environment due to the fact that they are "unconvinced of the concept, or […] unable or unwilling to participate". This unwillingness stems from the notion that there is no, or a lack of, quality control in an open access publishing environment due to the fact that the publisher may no longer be involved or that corners are cut thus bypassing key publishing functions (such as the copy-editing process and peer-review).

Bailey (2006) also adds there is some uncertainty with regard to copyright when it comes to open access publishing, even if open access is rooted in existing copyright law (Bailey, 2006). Authors therefore do not always know or understand what their rights are in this regard and would rather make use of a trusted avenue (through subscription-based publishing) (Shonwetter, 2014).

Harnard (2006) refers to this reluctance to publish as "Zeno's Paralysis". He explores the role of the publisher in a self-archiving environment, therefore, the researcher (or author) now becomes the publisher. He however acknowledges this "seemingly endless series of phobias (about everything from piracy and plagiarism to posterity and priorities)". He indicates that the only solution to this is to have a mandated scholarly publishing environment where researchers are forced to make their research available through the institutional repository. When looking at green open access through repositories, Albert makes an important point when indicating that some of the

senior faculty members do not know how to submit their articles due to simply not being able to understand the system (2006). Various researchers acknowledge a reluctance to partake in an open access scholarly publishing environment (Harnard, 2006; Shipp in Jacobs, 2006). The reasons for researchers not being willing to make their content available in an open access scholarly publishing environment range from being uninformed to being worried about plagiarism and quality control aspects (Harnard, 2006; Shipp in Jacobs, 2006).

3.6.4 No transparency of true cost of publishing

Esposito indicates that the cost implications of open access are not recognised or acknowledged by many (2013a,c). Some understand that open access, which is free to the reader, means that it is free for all role players and therefore have quality concerns when compared to the traditional scholarly publishing methods. The true cost associated with scholarly publishing is an aspect that is widely questioned in the open access environment. The scholarly publishing process that produces high quality content is a complicated one, with many steps and role players involved (Mercieca, 2008). Every step of this process has an associated financial implication. The APC – or other funding available – therefore needs to cover these services offered without being so high that it abuses the concept of APCs.

Many publishers choose an open access route without a complete understanding of the cost implications and then their journals cease to exist. It seems from the literature that many advocates of open access do not have an understanding of the costs associated with scholarly publishing. A scholarly society, for example, may choose to publish their journal in an open access environment for ideological reasons but may not be able to afford it if they no longer receive their subscriptions.

3.6.5 Open access not a replacement for traditional scholarly publishing model

The Nature Publishing Group (Hoole, 2011) indicates that the open access debate is a natural consequence of advances in technology and the new opportunities offered by these advances. As can be expected, there is some opposition to open access

publishing. Kennan and Kautz (2007) mention opposition from commercial journal publishers who see open access as potentially harmful to their business and their profits. Also mentioned in their article are some of the scientific societies for whom the subscriptions earned for their journal publications are a significant portion of their income and used to subsidise other activities.

Reisz (2009) indicates that many publishers acknowledge the importance of open access publishing together with the fact that some of their authors are mandated to include their work in such an institutional or subject repository. Keen to retain these authors, many publishers have adapted their policies to accommodate these mandates, but these are usually associated with an embargo period. It is however also true that the open access route that subscription publishers are most opposed to is in fact the "green" route of self-archiving due to the fact that these archives could contain articles that are incomplete and have errors with regard to formatting and grammar. According to Reisz (2009) the publishers maintain that these papers may also be incomplete and that the lack of version control leads to confusion.

The worry of the academic publishers is that self-archiving becomes mandated in such a way that institutional libraries cancel their subscriptions therefore not allowing subscription-based journals to sustain themselves. Russell (in Reisz, 2009) asks "[i]f the subscription journals are unable to sustain themselves, what will provide that authority and badge of trustworthiness?"

The Nature Publishing Group (Hoole, 2011) indicates that "one size does not fit all" (also see Esposito, 2013a,b,c; Van Noorden, 2013). Hoole makes the argument that journals with high circulation figures and high costs per manuscript published are better served in a subscription model where the costs can be spread amongst the high number of readers, while journals with lower costs are well suited within an open access publishing model with affordable article processing charges, due to the lower paid circulation (Hoole, 2011). It is therefore also important to consider that when choosing a publishing business model, the publisher and other parties involved need to consider if this model will best suit their particular needs.

3.6.6 Greater access instead of open access

There are also some who believe that the answer may not be open access but "greater access" (Lende, 2012; Shieber, 2011). This motivation stems from two issues. The first, that the research cycle will not necessarily continue if subject-specific research is made available to anyone, due to the fact that only specific individuals operate within specific research fields (Lende, 2012) and second that open access may make sensitive information too freely available to actors who do not have the best interests of others at heart (for example when it comes to terrorist activities) (Shieber, 2011). In this instance the issue of mandated open access from the side of the funder comes into play. The Archeological Institute of America, for example, publishes research funded by the government. They believe that "while the government might have a right to the unfinished work product [raw data] of researchers to whom they provide financial support, it does not have a right to the research articles" (Shieber, 2011). The reasoning behind this is that the final publication is the combined effort of experts in various fields (of research and publishing) and that these efforts at quality enhancement are not funded by the government. By making these articles available in an open access format, the publications cannot be sustained (Lende, 2012). They therefore believe that the community who creates the content are not the ones who benefit from it.

Esposito (2013a,c) indicates that even if open access publishing is for the purpose of increased dissemination of research, this is not always the case. Many publishing researchers are already affiliated with institutions that already have access to some of the important literature in specifically identified subject fields (in accordance to the need of the organisation), and may therefore not be interested in using information that is available in the open access environment (also see Van Noorden, 2013). Marar (2013) also indicates that dissemination may be hindered due to the lack of discoverability – and therefore the quality of the journal and the function of the publisher is very important.

Marar (2013) highlights the important function of the publisher in the open access environment when it comes to all facets of quality assurance. Consequently, when it comes to the dissemination of the research the reputation of an initiative, whether

linked to the brand of the publisher or the title of the journal, becomes an important factor in capturing the attention of the author as well as the intended reader. He however questions the ability of a new initiative in the open access scholarly publishing environment to establish such a positive reputation. "How will they build the reputation, authority and prestige to start with?" (Marar, 2013). He explores the possible new mechanisms of alternative measures of journal quality: "article level metrics, usage factor measures" vs. "citation indices" and questions whether these are not more reliant on "popularity" than "authority" (also see Adriaanse & Rensleigh, 2011; Esposito, 2013a,b,c).

Osborne (2013) challenges the notion of open access indicating that it may not necessarily contribute to academic discourse, because the intended target audience is not reached and the abundance of information available is not understood.

> *There is a gross misunderstanding in the open access debate about the nature of academic research and publication. Academic research publication is a form of teaching. Academic research publications deal not in sets of facts and figures but in understanding. But academic research publication is a form of teaching that assumes some prior knowledge. For those who wish to access, there is an admission cost: they must invest in the education prerequisite to enable them to understand the language used. Current publication practices work to ensure that the entry threshold for understanding my language is as low as possible. Open access will raise that entry threshold. Much more will be downloaded; much less will be understood.*
>
> (Osborne, 2013).

Osborne therefore challenges the quality of research output promoted by open access scholarly publishing. The next section will identify the various business approaches or publishing models for open access publishing.

3.7 The scholarly publishing ecosystem

According to Kennan and Kautz (2007) for scholarly research to be distributed, scholarly research must be communicated, used, disseminated and developed within a community. These researchers define the scholarly publishing process as a large international information system, to which the individual researchers, their institutions and organisations, libraries, commercial and learned organisation publishers, contribute. Marar (2013) indicates that this ecosystem is diverse in its "varying norms and working practices" in various disciplines. This indicates that information is also produced in different ways.

The researcher simplified the scholarly publishing model in Figure 3.3.
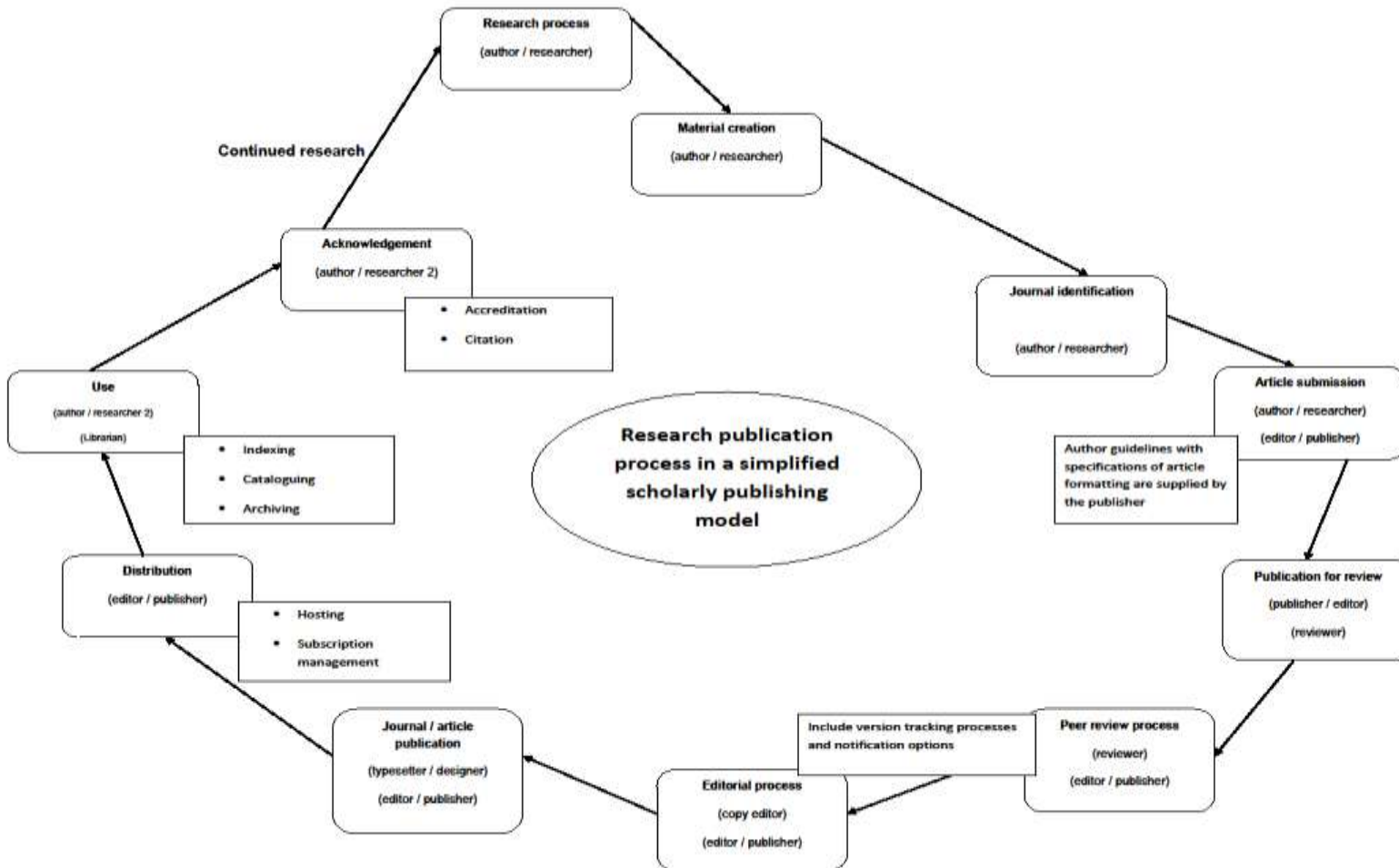
Figure 3.3 Simplified scholarly publishing model (Addapted by the researcher from Kennan & Kautz, 2007; Morris, et al., 2013)

Figure 3.3 depicts the various role players associated with the scholarly publishing process. The scholarly publishing ecosystem is made up of all these role players.

Swan (2012) describes the open access scholarly publishing environment as an interactive infrastructure:

> *Open Access progress depends on having the right infrastructure to enable people to participate easily, simply and quickly. They need journals and repositories that they can trust, plus well-designed, comprehensive, accurate and easy to use information resources so that they can comply with policies without concern. Beneath this "human layer", the system needs invisible technical services that take from authors and users any burdensome aspects of the process of providing and using Open Access material. These services must smooth and enrich deposit without author involvement; expose authors' work in maximally effective ways, returning to authors, research managers and funders, information about how work is being used without fear of misidentification, inaccurate counting or major gaps in data; make payment for Open Access as invisible as payment for subscriptions to all but a necessary few; present OA research to users in helpful, easy to find ways; and ensure that users trust that what they can find today they will still be able to find ten to twenty years hence.*

<div align="right">(Swan, 2012).</div>

3.7.1 Scholarly publishing role players and their roles

The previous sections discussed three broad and inter-connected publishing approaches: a traditional print scholarly publishing model, that has been enhanced in a digital subscription publishing environment, which, in turn, has offered opportunities for an open access scholarly publishing environment.

Shieber (2009) indicates that the traditional publishing model provides an existing, workable infrastructure for the open access publishing environment. Kennan and Kautz (2007) also indicate that these new open access models work within the existing

(i.e. subscription) structures, but with different routes and new role players and technologies. It is important to consider that open access articles are not free to publish (Suber, n.d.).

The previous section discussed the quality associated with a journal as a motivator for authors to make their work available through that title as well as for readers (possible future researchers) to trust a specific publication. This quality is achieved by the contributions of various role players.

As indicated by Esposito (2013a) the open access scholarly publishing environment is a service for the author. An author will be motivated to submit his or her work to a title or initiative with a high reputation and a quality service, due to the fact that they want the intended reader to be motivated to read their research (Crow, 2009; Esposito, 2013a; Marar, 2013).

A journal or initiative that can be seen as reputable is therefore one which can assure that the quality of the work published is of a high standard (Crow, 2009; Esposito, 2013a,b,c; Gardner, 2013; Mangiafico & Smith, 2014; Marar, 2013). The quality assurance function of the publisher (that will be discussed later in this chapter) is therefore very important and cannot be denied (Crow, 2009; Kennan & Kautz, 2007; Swan, 2012).

This section will define and analyse the roles of the various role players in the scholarly publishing environment. These will be discussed for all three broadly defined environments. Reisz (2009) places the institutional library in the middle of the scholarly publishing environment as the "biggest user" of scholarly output in the form of journal articles. He indicates that they are sandwiched between the academics (researchers) who demand access to relevant, high-quality research articles and the publishers, who charge them for that content (Reisz, 2009).

The role players identified as active in the scholarly publishing environment are therefore:

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- Commercial and society publishers (Gardner, 2013; Hilf in Reisz, 2009; Kennan & Kautz, 2007; McGuigan & Russel, 2008) or presses (Withey et al., 2011)

- Authors/researchers/academics/scholars (Hilf in Reisz, 2009; Kennan & Kautz, 2007; McGuigan & Russel, 2008; Reisz, 2009; Withey et al., 2011)

- Affiliated institutions (Kennan & Kautz, 2007) for example the university where a researcher is employed

- Libraries (Kennan & Kautz, 2007; McGuigan & Russel, 2008; Reisz, 2009; Withey et al., 2011)

- Repository administrators or host administrators (Withey et al., 2011)

- Funding agencies (Withey et al., 2011)

- The readers (Esposito, 2013a)

These role players are present in all three broad publishing approaches and fulfil important roles. This investigation will indicate their perpetual roles (in other words, throughout all three environments) and also indicate where these roles are shared, transferred or have evolved.

Note that all the roles discussed in this analysis are not mandatory, they are included to illustrate what possible roles the various role players could have in any given scenario.

3.7.1.1 Authors/researchers/academics/scholars
i) The perpetual role of the author

Scholarly publishing is an important part of the academic profile of researchers (Swan, 2012). The findings and applications that they generate from previous publications (Bosch & Harnard, 2005) are ordered in the form of research writing (Kennan & Kautz, 2007).

The influence of the author in the scholarly publishing process is an important consideration seeing as they choose the journal or publisher that they wish to submit their work to (Peters, 2007; Swan, 2012) which in turn links to an important involvement with the notion of the academic reward structure (Kennan & Kautz, 2007)

where authors want to build their academic reputation and be associated with high quality publications (Björk, 2013; Esposito, 2013a,c; The Economist, 2012).

The publication of research in the traditional print publishing environment feeds back into the research cycle (Kennan & Kautz, 2007) thus allowing future researchers to build on the available study.

ii) The role of the author in the subscription environment (print and digital)

In a digital environment the author can become the publisher (for example via self-publishing) (Crow, 2012; Swan, 2012) or self-archiving by linking directly with the repository (Kennan & Kautz, 2007; Swan, 2012). Digital enhancements produce an interactive environment which allows for discussions and comments on other works. The author can therefore become the reviewer (Esposito, 2013a,c; Kennan & Kautz, 2007; Shieber, 2009). The author now operates in an environment where sources can be linked together (Ware, 2007; Naughton, 2013). These roles will remain applicable in the open access scholarly publishing environment.

iii) The role of the author in the open access environment

The digital scholarly publishing environment allows the author to take on a much more involved and active role than simply doing research and submitting that research. The author now becomes the client (due to the fact that the author will choose the medium or platform through which the research will be published) (Mercieca, 2008) and a paying customer (by paying author processing fees) (Shieber, 2009; Spiller, 2013). Esposito states that "to make something free for the reader it cannot be free to the author" (2013c).

3.7.1.2 The role of the scholarly publisher in the scholarly publishing ecosystem

When investigating the functions of the publisher, it is important to consider that the publisher can also be the editor of the journal (in the case of a society publication for example).

i) The perpetual role of the scholarly publisher in the scholarly publishing environment

The publisher allows the avenue for formal publication and provides access to academic research (Kennan & Kautz, 2007; Osborne, 2013), and in order to facilitate this, the publisher needs to fulfil specific functions. The publisher is the coordinating connection between all the role players (Scott in Keating, 2012; Shieber, 2009; Withey et al., 2011). It is therefore important that a publisher should always be informed about the wider scholarly publishing environment (Swan, 2012).

Anderson (2013) discusses the value addition functions of the publisher with regard to the launch of a new journal as well as to the ongoing quality control responsibilities by indicating that "publishers are integral to scientific progress".

When a new journal is launched in either the printed or digital environment the publisher is responsible for the following:

- Recognition of the new research field and acknowledging that a new communication instrument (journal) is needed.
- Launch of the new journal title.
- ISSN application and registration.
- Establishing a viable brand associated with the journal.
- Establishing a good reputation.
- Initial funding.
- Establishing infrastructure system and contracts.
- Soliciting first papers.
- Recruitment of editors and reviewers.

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- Training of editors according to the needs of the journal and associated subject field.

(Anderson, 2013a)

Some responsibilities of the publisher are ongoing (Anderson, 2013). These include:

- Management and protection of records (subscriber and editorial).
- Management of sales forces.
- Maintenance of facilities and online platforms.
- Conducting market research.
- New customer marketing.

(Anderson, 2013a)

As indicated above, the reputation and the brand that were established now need to be maintained and cultivated (Anderson, 2013a; Esposito, 2013a,b,c; Swan, 2009).

This reputation is linked to the important quality assurance role of the publisher which is seen in the perception of the quality of the journal.

Quality assurance and filtering of submitted articles (Anderson, 2013a,b; Crow, 2009; Crow, 2012; Esposito, 2013a,c; Marar, 2013; Mercieca, 2008; Morris, et al., 2013; Peters, 2007; Van Noorden, 2013; Withey et al., 2011) is coordinated by the publisher. The selection of the editorial board of the publication and communication with this group (Anderson, 2013a; Kennan & Kautz, 2007; Withey et al., 2011) is done by the editor or the associated society.In cases where the editor is the publisher, the editor of the journal "brings deep and extensive experience". Editors can therefore make nuanced and difficult decisions about submitted work (Marar, 2013).

Peer review "is the system by which a research article is reviewed by independent experts (the author's peers) to help the Editor-in-Chief reach a decision on publication" (Morris, et al., 2013). The process provides certification of the published article (Kennan & Kautz, 2007; Swan, 2012). For the peer-review responsibility of the

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publisher, reviewers need to be selected and also trained in the workflow of the publication (Anderson, 2013a). Reviewers may also include statistical and technical reviewers (Anderson, 2013a) which are not used by or required for all publications.

This assurance in the form of formal publication communicates trustworthiness (Kennan & Kautz, 2007; Morris et al., 2013; Peters, 2007; The Cost of Knowledge, 2012) and also provides access to an audience that is not limited to the primary reader (Kennan & Kautz, 2007) together with links to associated sources via citations (Morris, et al., 2013). This trustworthiness is an important factor in the reputation of the journal and communicates "tenure, promotion and prestige" (Withey et al., 2011). This quality assurance allows the publisher to establish an authoritative version (Withey et al., 2011). The formal publication process is very important in the academic reward structure (Kennan & Kautz, 2007) and the career building of the author (Björk, 2013; The Economist, 2012).

Aside from coordinating important quality control functions such as editing and review (Anderson, 2013a,b; Dobbs, 2012) the publisher also has presentational expertise that allows for enhancements to the published research (Esposito, 2013a,c; Withey et al., 2011). Anderson (2013a) indicates that the PDF is still important in the digital age and that the publisher has layout and composition authority. This includes the creation or obtainment of illustrations and art handling (Anderson, 2013a).

The publisher is also responsible for the identification of new market places (Anderson, 2013a; Withey et al., 2011).

The very motivation for scholarly publishing rests upon the notion that the published research will be used for future research and therefore archiving and preservation needs to support the long-term availability of the authoritative version established by the publisher (Morris, et al., 2013; Swan, 2012; Teisser, 2011; Withey et al., 2011) and consequently the retrievability of that research, not only for future researchers but for the author of the research itself (Teisser, 2011).

ii) The role of the publisher in the subscription publishing environment (print and digital)

Section 2.1 discussed functions that are applicable to all three publishing environments. This section will highlight roles of the publisher that are only valid in a subscription environment.

In this environment the absorption of commercial risk (Crow, 2009; Crow, 2012; Kennan & Kautz, 2007; Swan, 2012) and also the authority on rights and licensing (Anderson, 2013a; Withey et al., 2011) are important roles linked to the publisher.

The registration of the research (Kennan & Kautz, 2007) and the archiving of the content in the subscription (print and digital) environment, is also the responsibility of the publisher (Dobbs, 2012; Swan, 2012).

Due to this implementation of quality assurance (as discussed in section 2.1) the publisher is in the position to (and responsible for) impose reader access charges (Houghton, Rasmussen, et al., 2009). The publisher will then also be responsible for creating and maintaining an e-commerce system (Anderson, 2013a & 2013c).

iii) The role of the publisher in the digital publishing environment (subscription and open access)

Section 3.5 considered scholarly publishing as a service to authors (where the author now becomes the paying customer). These two environments therefore overlap in this instance, due to the fact that it is either a role within the digital subscription environment or a service offered to the author in the open access environment. This mind set change redefines many roles within the scholarly publishing ecosystem.

The digital scholarly publishing environment allows for research content to be placed in a wider context (Scott in Keating, 2012; Ware, 2007). It is this capability that allows for the author to become the publisher (Crow, 2012; Kennan & Kautz, 2007; Swan, 2012).

In this wider context the tracking and measurement of usage of research becomes very important (Lossius, 2013; Swan, 2012) for not only the researcher but also for the academic reward system relating to the research reputation of the author inside the research community (Björk, 2013; Kennan & Kautz, 2007; The Economist, 2012). In the digital subscription environment this is the responsibility of the publisher where in the open access environment this responsibility shifts to the shoulders of the author.

In a digital environment multiple publication formats exist. The creation and management of these multiple formats are the responsibility of the publisher (Withey et al., 2011). XML mark-up is the foundation for exporting to any of these multiple formats and is therefore also an important role of the publisher or the service that the publisher offers in the open access environment (Anderson, 2013a; Mercieca, 2008 and Naughton, 2013). Anderson (2013a) links "document type definition" (DTD) with XML markup. The publisher is therefore regarded as the metadata authority and must provide the required enhancements and tagging for the metadata of publications (Anderson, 2013a; Maxwell & Fraser, 2010; Withey et al., 2011). The maintenance of this metadata is also the responsibility of the publisher (Anderson, 2013a & 2013b; Withey et al., 2011). To ensure retrievability (which is linked to the role of the research library, which will be discussed later in this chapter) an identifier needs to be assigned. According to Burnhill and Pelle (2013) "if it is worth preserving for the long term, it should have an identifier".

In such a wider context it is also very important for the publisher to define the various client segments (Anderson, 2013a; Crow, 2009; Crow 2012; Keating, 2011) to make sure that the various needs are accordingly addressed (Crow, 2009; Crow, 2012; Groth, 2012). The decision of what platforms will be implemented depends on an understanding of what these client segments need and is also a role of the publisher (Groth, 2012; Mercieca, 2008; Swan, 2012).

Should any requirements exist for non-digital formats of the publication this is also the responsibility of the publisher (Anderson, 2013a & 2013b; Withey et al., 2011). Such services may include re-prints (of a journal or a specific article that has been repackaged for another purpose).

Instead of charging subscription fees the publisher now needs to administer author processing fees (or other income according to the applied business model).

The digital environment offers other possibilities which also produce responsibilities for the publisher, such as plagiarism detection (Anderson, 2013a & 2013c; Van Noorden, 2013) and decisions with regard to hosting and archiving (Anderson, 2013a; Swan, 2009). Search engine optimisation is also very important in the digital environment. Anderson motivates that "authors want their papers to be found" (2013a).

It is important to consider that not all publishers fulfil all the roles as discussed in this section and may only provide specific services in accordance with the needs of their clients (Van Noorden, 2013).

3.7.1.3 The role of affiliated institutions in the scholarly publishing ecosystem

The term "affiliated institutions" refers to the institutions with which the authors are affiliated in any way (for example they are employed by a specific university).

i) The perpetual role of affiliated institutions in the scholarly publishing environment

These institutions fund the library budgets which in turn subscribe to scholarly journals (Shieber, 2009) and may also offer research grants (Shieber, 2009). These grants could be applied to page fees (in the traditional publishing environment) or to author processing fees (in the open access scholarly publishing environment).

Authors employed by institutions are often contractually obliged to publish their research (according to various conditions and stipulations). These institutions therefore manage research output (Swan, 2012).

ii) The role of affiliated institutions in the open access scholarly publishing environment

Funding is granted to affiliated researchers in accordance with certain specifications. It is therefore the responsibility of the institution to evaluate and consequently indicate which journals will be eligible for article processing fees paid by the institution (Shieber, 2009). The institutions also need to mandate open access in accordance with their policies (Olivier, 2009).

3.7.1.4 The role of the library in the scholarly publishing ecosystem

The involvement of libraries in the scholarly publishing process is important in the research cycle. This is due to their "[e]xpertise in building infrastructure, creating user friendly services of high quality and securing long term access" (IFLA Statement, 2011).

i) The perpetual role of the library in the scholarly publishing environment

According to Burnhill and Pelle (2013) "the key task for research libraries is to ensure access to the scholarly and cultural record". The most obvious role of the library is to make content available to researchers (Kennan & Kautz, 2007; Swan, 2012) but also to ensure continued access to that research for future users (Burnhill & Pelle, 2013). This role has a different meaning in the print environment and the digital environment (Burnhill & Pelle, 2013). They consequently also have an important involvement in the academic reward system (Kennan & Kautz, 2007). Due to their extensive knowledge of metadata management, and their traditional role as metadata authority (Kennan & Kautz, 2007; Withey et al., 2011) the library places related content in a "wealth of information" (The Library of the Future is Mobile, 2012). The library therefore fulfils a resource management role (Gardner & Inger, 2012) through its indexing function (Gardner & Inger, 2012) as an important aggregator of various information sources and also the preservation thereof (Kennan & Kautz, 2007).

ii) The role of the library in the subscription environment (print and digital)

In section 4.1 the researcher highlighted the archival role of the research library and this is an important overlap between the print and digital environments. The library should therefore be responsible for, or assist in the digitisation process of the available content that is currently only available in print, to guarantee the preservation of and continued access to scholarly research (Burnhill & Pelle, 2013). Important to consider, therefore, is that in a digital environment the library no longer "takes custody" of everything that they make available to their patrons (Burnhill & Pelle, 2013). This is true for open access content as well as other subscription-based collections that reside on other servers.

The library remains the biggest user of scholarly output from journal articles (Reisz, 2009) and library budgets pay for subscriptions (Shieber, 2009) in the traditional print subscription as well as the digital subscription publishing environments. Many publishers therefore rely on the continued subscription renewal of libraries.

iii) The role of the library in the digital environment (subscription and open access)

In an investigation of the usage habits of researchers in the digital age Gardner and Inger (2012) highlight the importance of the library web page (or library OPAC) as a starting point for researchers. This is echoed by Russell (2013) who states that "visibility via library technologies is key to maximising [journal] usage". When investigating the workflow of the scholarly publishing cycle (as illustrated in Figure 3.3) this is a very important function.

Due to this aggregative function of the library in the digital environment they now have the important function of creating and configuring link resolvers (Keating, 2011). According to The Library of the Future is Mobile (2012) "data [in a digital environment] becomes a transferable object that can be available from anywhere". The library, therefore, becomes not more than a wealth of information but an "interactive learning environment" (The Library of the Future is Mobile, 2012) that can be accessed from anywhere.

Another important function of the library is that they may also be the host for the institutional repository (Swan, 2012) which will be discussed in the next section.

3.7.1.5 The role of the open access repository in the scholarly publishing ecosystem

When investigating the role of the repository it is important to note that these can be institutional repositories or subject repositories. Repositories can be very basic or be the foundation of an interactive self-publishing platform for researchers (Esposito, 2013b).

i) The role of the repository in the digital scholarly publishing environment (subscription or open access)

The main purpose of open access repositories is the same as that of dissemination and circulation of research findings (Swan, 2012). In a digital environment publishers and authors can now link directly to repositories (Kennan & Kautz, 2007). These repositories should therefore have systems in place that allow for ease of use for these various users (Esposito, 2013a). An open access repository could be used as a means of preservation of the authoritative version of an article that was established by the publisher originally (Withey et al., 2011). There are however some concerns with regard to the versions submitted to repositories which are discussed in section 3.7.

Another (perhaps secondary) role of an open access repository is that it offers a digital backup for authors (Esposito, 2013a).

3.7.1.6 The role of the host / aggregator in the scholarly publishing ecosystem

For the purposes of this study, when referring to the host, reference is made to the aggregator of the full text of a research article. Third party data vendors that only make available the metadata of a publication and the articles published in that publication without the full text will be explored later in this chapter.

i) The role of the host in the digital scholarly publishing environment (subscription and open access)

The host can simply be regarded as a storage option for the author or publisher, thus "[providing] technology services to academic researchers" such as cloud storage, annotations and reference management (Henning, 2013).

A host is responsible for linking the user to the publication of research findings (Swan, 2012). These hosts can maintain a platform that provides search functionality and in such an instance they will be responsible for indexing, abstracting and retrievability (Kennan & Kautz, 2007) therefore XML mark-up (Mercieca, 2008). Such a platform should also be available for harvesting from various search engines and also other third party data vendors (which will be discussed in the following section).

In the case where an author needs to make a payment for the submission of an article the host will be responsible for the processing and administering of these payments as well (Shieber, 2009).

3.7.1.7 The role of the third party data vendor in the scholarly publishing ecosystem

These are also known as citation indexers, reference managers, subscription agents (Shieber, 2009) or data centres (Swan, 2012).

For the purpose of this comparison, the researcher made a distinction between the host, who hosts the full text of the article, and the third party data vendor, who makes

metadata available on behalf of the publisher or author for the enhancement of retrievability and discoverability (Swan, 2012).

Third party data vendors work with the metadata of journals and the articles published in them. An important function that they need to fulfil is therefore data harvesting and then indexing, abstracting and retrievability (Kennan & Kautz, 2007). The statement made by Scott in Keating (2012) is applicable in this role as well – "the article becomes a research object" that can be made available via various routes and in various formats.

These vendors can link users to information in the open access as well as subscription environment (Swan, 2012). These vendors also have a strong footing to make usage statistics available to publishers and libraries. According to Lossius (2013) "any service that increases the general discoverability of academic content makes it much easier for publishers to demonstrate usage to librarians. This in turn will help [libraries] support subscriptions". These vendors therefore also have an important involvement in the academic reward structure (Kennan & Kautz, 2007; Swan, 2012).

3.7.1.8 The role of funding agencies in the scholarly publishing ecosystem

When referring to a funding agency, the researcher refers to any organisation responsible for financial input in the scholarly publishing process.

i) The perpetual role of funding agencies in the scholarly publishing environment

Funding agencies are those organisations responsible for the funding of the publication of research findings (Swan, 2012). They therefore also have an important involvement in the academic reward system (Kennan & Kautz, 2007) in the way that they "reward and punish recipients of their funding" (Björk, 2013). These agencies can be regarded as responsible for the management of research output through setting specific conditions and mandates (Swan, 2012).

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Marar (2013) indicates that it is important for these funding agencies to acknowledge the need for and include the possibility to fund the cost of submitting an article in an open access publishing environment.

These funding agencies could also be the organisations contributing to the library budget (Shieber, 2009), thus contributing to subscription fee availability.

3.7.1.9 The role of the reader in the scholarly publishing ecosystem

i) The perpetual role of the reader in the scholarly publishing environment

If the reader is the author (Kennan & Kautz, 2007), the reader completes the scholarly publishing cycle when a research contribution is made in the form of a published article. The reader will therefore read and use research findings (Swan, 2012). This continued research creates a need on behalf of the reader, who demands access to high quality articles that are relevant to his or her field of study (Reisz, 2009).

ii) The role of the reader in the digital scholarly publishing environment (subscription and open access)

It is important to consider that the experience of the reader in a digital environment is different, and the expectation of the reader is therefore also different (Groth, 2012). A digital environment allows for an interactive reader who can post comments and in truth become the reviewer (Kennan & Kautz, 2007; Russell, 2013). The literature refers to "the wisdom of crowds" as a form of "post posting or post publishing review" (Henning, 2013; Marar, 2013).

The reader can now also link resources together (Berkley University, 2012; Ware, 2007) thus promoting the discoverability of research articles.The reader may also be the funding agency (Kennan & Kautz, 2007). It is when the reader is the author that the research cycle is completed.

3.8 Factors contributing to sustainability of open access scholarly publishing

The report of the AAUP Task Force (Withey et al., 2011) indicates that when considering the business model suited to the mission of a publisher or organisation, it should in its foundation be considered to answer the mission of scholarly communication, seeing as open access publishing stems from this very motivation. Scholarly communication in the form of scholarly publishing has been extensively investigated in this section and the importance of the scholarly community (or ecosystem) has been evident throughout. The AAUP Task Force (Withey et al., 2011) indicates that a chosen business model will only be effective when it recognises the various roles of the various role players within this ecosystem and treats it as a whole.

According to Björk (2013) the "author pays model" has proved sustainable already. In the wider spectrum he therefore includes all funding methods under this author pays method, indicating that the cost is derived from the point of submission and not from the user or reader. For the purposes of this research study, it is important to evaluate the sustainability within these pay-to-publish models, seeing as the researcher wants to offer a sustainable model in the South African context.

Firstly, the term "sustainability" needs to be defined in the context of this research study. Crow (2009) defines sustainability in scholarly journal publishing by asking the question, "how will the business model sustain the enterprise?" In other words, can the publication or initiative continue growing? According to Swan (2012) this measure of sustainability needs to be evaluated not only for the publication but for all aspects associated with the publication (the publishing process and support services of open access publishing).

Bearing the scholarly publishing ecosystem in mind, it is therefore important to investigate sustainability by considering all the role players within the scholarly publishing community or ecosystem. Crow (2012) indicates that a business venture with regard to open access scholarly publishing can only be successful once you understand the motivation for all the role players to take part.

Crow (2009) indicates that (when considering the environment of scholarly publication) the components of a business model associated with the publication of peer-reviewed journals are:

- Audience or client segment – everyone that derives value from the publication.
- Value proposition – what does the publisher offer to answer the needs of the audience or client segment?
- Core activities and resources – activities and resources that produce the journal and support the funding model should be aligned with the value proposition.
- Distribution channels – how does the research content / journal reach the intended audience?
- Income streams – how is income generated?

(Crow, 2009)

The researcher found the above to be a valuable approach for evaluating the various business models and as a foundation for the South African context that will be investigated later in this report. This approach includes all the role players and actions associated with scholarly journal publishing which is important due to the fact that this form of scholarly communication is reliant on an interactive ecosystem (Crow, 2012).

These various elements of the business model combined, therefore bring us back to the question: How will the business model sustain the enterprise? (Crow, 2009). In other words: can the publication or initiative continue growing? The literature provided further explanation of every business model element.

3.8.1 Audience and client segment

Crow (2009) indicates that this element includes everyone that derives value from the publication. According to this literature study, focussing on the scholarly publishing ecosystem (Withey et al., 2011) all the role players in the scholarly publishing environment can be included here as defined in section 3.7.1 Cockerill (2006) indicates that an open access publishing initiative is only sustainable if it is affordable to the community it serves. Esposito (2013a,c) links to this notion by discussing the various needs created by the various client segments which are answered by the

service offering of the publisher or publishing service (also see Spiller, 2013). Esposito therefore highlights that it is important for the publisher or the publishing service to "know who their customers are" (2013a) thus motivating that only an identifiable market segment can be served (Esposito, 2013a).

3.8.2 Value proposition

Crow (2009) indicates that the value proposition needs to be considered for all the role players (audience or client segment) (also see Crow, 2012, Esposito, 2013a,c and Swan, 2012). According to this literature study, the exploration of scholarly publishing as a service industry (as discussed in section 3.5.4) becomes applicable. This is due to the fact that all role players that make up the audience or client segment (depending on the publishing model) should be motivated to participate actively within the scholarly community or ecosystem (Crow, 2012; Swan 2012). To illustrate this notion Crow (2009 and 2012) suggests the following payment model:

Table 3.3 Crow's payment method (Crow, 2009)

Role player (audience / client segment)	Payment method	Paying for
Reader	Attention	Applicable information towards continued research
Author	Contribution	Publication of research
Funder	Funding	Attention of the reader

The value proposition offered by a publisher should therefore answer the needs of the associated role players (Gardner, 2013). Examples of this include:

- Quality control of articles
- Preservation and continuous access to research information
- Offering efficient and user friendly services
- Maintenance of an interactive hosting infrastructure

(IFLA Statement, 2011)

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3.8.3 Core activities and resources

Crow (2009) indicates that this element defines the activities and resources that produce the journal and support the chosen funding model. Services should be aligned with the value proposition offered (Crow, 2009; Crow, 2012; Esposito, 2013a,c). As indicated in the publishing model analysis, even smaller publishers can offer a sustainable business model by providing the service required by their target audience or the community that they serve (Esposito, 2013a,c; Peters, 2007).

Resources may also be intangible (Crow 2007; Swan 2012). An example of such a resource incudes the reputation of the journal (Crow, 2007). These intangible resources are linked with the quality of the journal.

3.8.4 Distribution channels

The distribution channels are concerned with how the research is disseminated to the intended reader (Crow, 2007), whether it be the printed edition or the various methods associated with the digital environment. When open access scholarly publishing was defined the importance of preservation and retrievability was also mentioned (Halliday, 2001; Open Society Institute, 2005). The hosting platform and ease of use are therefore important considerations in this section (Swan, 2012).

3.8.5 Income streams

This element is focussed on the specific means by which financial income is generated for the journal publication and associated activities (Crow, 2009). Esposito (2013a,c) states that for any publishing model to be sustainable there has to be a sound economic model in place. He also reminds us that "[t]o make something free for the reader it cannot be free for the author" (Esposito, 2013a).This is also echoed by Gardner (2013) who states that "neither Green nor Gold comes for free". These possibilities were investigated in the discussion of the publishing models and include the following:

- Article processing costs (Cockerill, 2006; Crow, 2009; Crow, 2012; Open Oasis, 2011; Peters, 2007; Terry & Kiley, 2006).

- Advertising (Bailey, 2006; Crow, 2009; Crow, 2012;Open Oasis, 2011).

- Sponsorships (Cockerill, 2006; Crow, 2009; Crow, 2012; McGuigan & Russell, 2008;Open Oasis, 2011).

- Subsidy or donations (Cockerill, 2006; Crow, 2009; Crow, 2012; McGuigan & Russell, 2008; Open Oasis, 2011; Van Noorden, 2013).

- Membership fees (Bailey, 2006; Crow, 2009; Crow, 2012; Open Oasis, 2011).

It is important to keep in mind that these can be used in combination (Crow, 2009; Swan 2012).

The previous sections highlighted that the gold open access route makes sense due to the fact that the funding simply needs to come from somewhere else (Reisz, 2009). Esposito (2013a) indicates that the green open access route of self-archiving is supported by the institution by making the platform available (such as an institutional repository). The ongoing operation of this repository is however not always considered in the budget as this money simply goes into the overheads of the library, thus compromising the continued availability of the associated funds and responsible staff (Esposito, 2013a).

Open access business or publishing models continue to be widely promoted and advocated within the scholarly publishing community as a solution to the access problem to relevant research and also the funding problem when it comes to the communication of research (Waltham, 2006).

Even if open access scholarly publishing answers these needs, any publishing venture needs financial input and the sustainability of open access scholarly publishing models needs to be investigated (Mercieca, 2008). Crow (2012) indicates that when it comes to the planning and design of a service (such as those associated with open access scholarly publishing) sustainability planning should be treated as an essential element. According to Open Oasis (2011) the lower the cost base the easier it is to develop a way of doing business that is sustainable.

Waltham (2006) indicates that when it comes to the cost associated with publishing research, one needs to consider far more than only the physical publication. A publisher, for example, will need to consider new product development, the launch of new journal titles and society activities (where the publisher is a learned society) like conferences and meetings (Waltham, 2006). The cost of a single article is also driven by various factors. These include the overall rejection rate (the higher the rate the higher the cost per published article); the length of the article; the number and complexity of figures and illustrations; and the editing process – it may for example be more time consuming to edit the work of an author or researcher who is not writing in his or her first language.

Cockerill (2006) makes the valuable point that any chosen publishing model is only sustainable if it is affordable to the community that it serves. In consequence the traditional scholarly publishing model is, in fact, not sustainable seeing as it is dominantly funded by academic library budgets. Cockerill therefore makes the distinction between sustainable vs. self-supporting (2006).

Sustainability of any scholarly publishing business approach is therefore reliant on whether all the needs of all the role players are met by the value proposition of the publisher.

3.9 Conclusion

Chapter 3 took the form of a literature study and investigated the international scholarly publishing environment. This in-depth investigation provided this study with the following information:

A thorough investigation of the traditional scholarly publishing environment (both print and digital) was conducted producing a simplified publishing model as a foundation for contextualised continued discussions.

This investigation also indicated the opportunities offered by a digital environment allowing for open access publishing model implementation. When investigating the open access scholarly publishing environment the researcher identified the various business models implemented in this environment together with the associated role players, examples of implementation and challenges associated with each.

After identification of the role players in each environment, the researcher continued to indicate their roles within the ecosystem, motivating that some functions change within a different publishing milieu. This role identification is important for the investigation of the South African context. The researcher also identified factors contributing to sustainability from the literature.

This chapter will become the foundation of the investigation of the South African open access scholarly publishing environment. It produced an in-depth investigation of the various open access publishing possibilities and also a foundation for discussion with regard to work flow and role players. It also produced a sustainability measurement which will allow the researcher to identify sustainability factors within the South African context.

Chapter 4 will use the foundation of the study of the international context to investigate the open access scholarly publishing environment in the South African context.

Chapter 4: Open access scholarly publishing in the South African context – an in-depth investigation with case studies

4.1 Introduction

In Chapter 3 the researcher documented an in-depth investigation on scholarly publishing in the international context. The researcher thoroughly described the associated landscape as a foundation for the continued study with regard to the sustainability of open access scholarly publishing in the South African context.

Chapter 4 will investigate the open access scholarly publishing scenario in the South African context. The publishing initiatives included were discussed in Chapter 2. The researcher will make use of the identified factors contributing to sustainability, as documented and discussed in Chapter 3, to structure this chapter. The sample comprises South African examples that are typical of the open access scholarly publishing environment and fulfil various roles within this ecosystem.

The chapter will then continue to discuss the specific findings with regard to every publisher or initiative and then aim to group the findings together by highlighting topics within the factors of sustainability (as defined in Chapter 3) as well as specific challenges identified with regard to sustainability by the publishers as well as by the researcher.

This investigation was conducted via interviews consisting of open-ended questions (so as to encourage discussion) combined with a literature review, conducted by the researcher of relevant documents as well as the publishers' websites. The researcher therefore approached this section of the study as a desk study, triangulated with the primary data from the interviews.

Section 4.2 will discuss the findings according to every respondent. Later in the chapter the researcher will combine these findings, indicating which factors contribute and which hinder the sustainability of open access scholarly publishing in the South African context.

4.2 Discussion of case studies

This section will discuss the information obtained from the various identified publishers or initiatives. The researcher made use of a structured interview schedule and combined findings from discussions, the study of available literature and in-depth interviews to document and interpret these findings. The researcher based the structure of these case studies on the report on the sustainability of open access services by Crow (2012).

4.2.1 Litnet Akademies

Litnet Akademies is a journal published as a gold open access title and an example of a funded initiative. Information included in this section was obtained through a desk study as well as email interviews with the editors of the journal (Van Heerden & Galloway, 2015) and also various documents, case studies (including a case study done by Gray and Willmers in 2009) and the *Litnet* website (*Litnet*, 2014).

i) General background and information on publishing activities

Litnet is an Afrikaans popular culture website founded in 1999 by Professor Etienne van Heerden. Over time this website has grown into a virtual community. The *Litnet* website has various sections or sub-sites. One of these, the *Seminaarkamer*, is focused on publishing discourse addressing research issues associated with the focus of the website. Because of the discussions held in the *Seminaarkamer* and the influence these discussions had in the research community, *Litnet* launched *Litnet Akademies* (Gray & Willmers, 2009), an online journal, founded on the concept of greater exposure for South African cultural and literary issues (Gray & Willmers, 2009) which is also the motivation for it being available in the open access environment.

Litnet Akademies is accredited by the Department of Higher Education and Training and achieved this accreditation (from the then Department of Education) before publishing its first issue. This is a very unusual occurrence that was only possible due to the type of content already being published on the *Litnet* website (Gray & Willmers,

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2009), specifically the nature of the discussions published in the *Seminaarkamer* section. The title is an Afrikaans only publication (Gray & Willmers, 2009), and focused on Afrikaans language and culture issues.

Litnet Akademies offers a publication platform for Afrikaans articles in the fields of humanities, natural sciences, law and religious sciences. The title is freely available from the *Litnet* website and also on the South African e-journal platform *Sabinet Reference*. Contributors are not charged for their submissions. Authors of articles accepted for publication are paid for their submissions and so are the peer reviewers.

The journal falls under a gold open access model where a funder – mainly the Dagbreek Trust, in association with other funders and advertising income on *Litnet* – pays for the publication and publishing activities.

ii) Associated publishing process

Authors as researchers are assisted in the submission of their articles on the website. Submissions are done via email. In-depth guidelines are provided per section of the journal. Articles are only accepted for publication after approval via a peer review process.

The *Litnet Akademies* team comprises an editor and subject editors for every subject section of the journal. There is also a production manager, language advisor, editorial manager and a financial manager. The journal also has an advisory board for every subject area.

The publication team handles the production (language editing and layout) of the articles to get them publication ready. The website team loads the articles online as part of their responsibilities for getting other *Litnet* content on the website.

The articles are made available online and no print counterpart is published. They are published in an html environment allowing for the integration of additional relevant information, also making them fully searchable. The *Litnet* website therefore links relevant information to articles from other sections of the site, placing these articles in

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a wider research context. Van Heerden (in Gray & Willmers, 2009) talks about the "stickability" (or "stickiness") of the *Litnet* website: users who access the website tend to spend a lot of time on it because they can click through to various sections that are all linked together.

iii) Audience and client segment

The *Litnet* website has an average of 70 000 monthly visitors according to a study done by Media24 in 2012 (quoted in *Litnet*, 2015).

The journal offers publication options for broad academic fields, but the fact that the content is only in Afrikaans makes it a niche publication, in that it caters for language specific contributions.

The readership addressed by the content of this journal is the research community that makes use of the *Litnet* website and it offers opportunities for individuals to enter into debates, read discussions between authors and readers on literature and also to receive information on more generic aspects such as music, food, education and books. The design of the website also encourages active users to stay on the website, being led to relevant information that is linked to their original point of access.

The journal not only attracts South African authors but also researchers from international institutions publishing their research in Afrikaans (Gray & Willmers, 2009). The advisory board also has a high representation from international institutions.

None of the articles included in the publication are commissioned. There is however a financial incentive for contributors, over and above the research money received (usually by their affiliated institution) due to the accreditation of the journal. These funds are paid directly to the researcher (as author). The amounts were recently adapted and an announcement was published indicating that authors will receive R7 000 per accepted article in all subject areas of *Litnet Akademies.* This amount was originally higher, allowing for the launch of the platform, as well as motivating authors to submit their articles.

From small beginnings the publication now offers very specific groupings of publications, thus answering for the need of Afrikaans authors (as researchers) to publish their research in a high profile, accredited journal.

An announcement published in March, 2014 indicated that *Litnet Akademies* is in the process of developing a new platform for the journal and all associated content (Litnet, 2014). This platform would include sophisticated search functionality and also include more subject areas. At the time that this report is being finalised (2015) this platform is not yet available.

iv) Value proposition

As indicated in the previous section, the value of the journal lies within the fact that it addresses a very specific market and aims to promote the interests of that market. The value proposition is therefore aimed towards high profile researchers (as authors) who in turn promote future research contributions. The purpose of the journal is to promote the Afrikaans language together with Afrikaans cultural issues. The publication therefore aims to address individuals interested in this promotion and also to promote discourse through continued research.

The journal forms a part of the bigger *Litnet* website. This hypertext environment is linked. Relevant content is therefore available in a single search. For example, one may find an academic article which mentions a book and the review of that book will then also appear in your search.

The title is accredited and an additional financial incentive is also offered to the author (as researcher). This incentive was originally higher for specific subject fields. In an announcement published by *Litnet* in March 2014, these payments have now been standardised to amount to R7 000 for accepted articles in all subject fields (Litnet, 2014). This payment goes directly to the researcher and is over and above the payment received from the Department of Higher Education and Training, which usually goes to the affiliated institution of the researcher as author.

The existing website has a dedicated following. Articles therefore enjoy exposure within this interested and informed scholarly community and is placed within a larger research context. The announcement mentioned above indicated that *Litnet Akademies* is in the process of developing a new platform which will boast a more sophisticated search functionality and also open up possibilities for the inclusion of other subject fields.

The editorial board of the journal has a strong international profile due to the fact that they are not only from South Africa but also represent academic institutions that offer Afrikaans in their academic portfolio. Individuals from international institutions are therefore also incentivised and encouraged to publish their Afrikaans research in this journal.

Litnet also offers payment to the peer reviewers of articles (R700 at the time of writing).

v) Core activities and resources of the journal

The publication was founded from the existing *Litnet* website – thus introduced into an existing community of interest. This remains the nature of this community. The website allows for content to be linked together in such a way that articles in the journal enjoy more exposure than simply through the Table of Contents.

The whole website promotes Afrikaans and Afrikaans cultural issues. The community therefore encourages discourse with regard to matters of interest for this existing community. The website and consequently the journal, grows according to the needs of the community that it serves.

vi) Distribution channels

The journal is online only and available through the *Litnet* website. The journal has its own website but is dynamically linked with the various other sections of the website. The journal is also available through *Sabinet Reference* free to readers in the open access collection.

vii) Income streams

The whole *Litnet* website is financially supported by funding from the *Stigting vir Bemagtiging deur Afrikaans* (SBA) (Gray & Willmers, 2009), PSG Online and the *Dagbreek Trust*. Financial administration is dealt with by 24.com (part of Media 24) although the financial matters associated with the journal are managed by the SBA. *Litnet* also earns advertising income. All of these organisations have an interest and a mission to promote Afrikaans culture.

Litnet Akademies is a Section 21 company, meaning that it is registered as a non-profit organisation. This enables it to request donations and also funding from parties of interest. The lawful purpose of this section 21 company is the promotion of Afrikaans and Afrikaans cultural issues and funding is therefore granted by organisations with that same interest. These include various publishers (such as Lapa Uitgewers and NB Publishers) and other Afrikaans interest groups (such as the *Afrikaanse Taal- en Kultuurvereniging* (ATKV).

viii) General comments

*Litnet Akademies*is an example of an open access journal in South Africa that is constantly growing and evolving. The journal is supported by an active research community of high profile authors and a website that offers an integrated research environment and encourages users to explore various relevant sources.

The title publishes peer-reviewed, edited articles that are referred to in various discussions on the website and other associated research publications. It published more than 70 articles in 2014 which is exceptional for an academic journal in such a

niche field. Very few titles of this nature can afford payment for accepted articles, which is also an indication of the success of this title. The journal also has international submissions and esteem within the relevant research communities.

The business model and practices associated with this title are therefore important in the exploration towards a sustainable open access scholarly publishing model for the South African context.

4.2.2 *Image & Text* (Department of Visual Arts, University of Pretoria)

This journal is included in the study as an example of a single title published by a university department. The journal is gold open access by institutional subsidy from the University of Pretoria's Department of Visual Arts. The researcher had a interview with the editor of the journal who is also the head of the Department of Visual Arts at the University of Pretoria (Van Eeden, 2013). These findings were then combined with a desk study and information available on the website of the journal (*Image & Text*, 2014).

i) General background and information on publishing activities

Image & Text was first published in 1992 and was originally published as a subscription journal by the Department of Visual Arts at the University of Pretoria. The title initially appeared annually. The title obtained Department of Higher Education and Training (then Department of Education) accreditation and has retained that to date.

The journal started making its content available in the open access environment in 2001 and shortly afterwards stopped providing a print edition due to the expenses associated with printing such a title for such a small print run. At the time the journal had fewer than 150 subscribers and even with print on demand technology it was too expensive to print (Van Eeden, 2014).

This is the only publication associated with the Department of Visual Arts and is a specialist publication addressing visual culture which includes subjects such as "visual

anthropology, material culture, visual arts, design culture, visualising sciences and technologies, art history, philosophy, fashion, media and film studies, architecture, literary studies, tourism studies, new media and cyber theory" to name a few (Image and Text, 2015). The title is available on the journal's own website and also via the *Sabinet Reference* portal, where subscribers are charged a small annual subscription for access.

The motivation to make the title available in the open access environment was due to the fact that the editors and authors wanted their title to have the widest possible reach that the digital environment allows. The subscription price was considered too small to sustain the journal anyway (Van Eeden, 2014).

ii) Associated publishing process

When presented with the simplified publishing process, the editor indicated that this is an accurate depiction of their workflow. All articles are peer reviewed before acceptance.

The journal does not use any form of tracking system for their articles. All content is emailed to a generic address and then forwarded to the editor. She then makes an initial asssessment of the quality of the work before forwarding it to the editorial board for their input on the article. They are also asked to recommend reviewers. They usually have three names as possible reviewers per article. An article is then reviewed by two individuals with a backup option if someone is not available anymore.

Articles are often referred elsewhere (for example to *De Arte*, published by Unisa Press or *Critical Interventions,* published by David Krut Publishing). This indicates that the editor does not wish to compromise the focus of the journal simply to accommodate more submissions. It also emphasises how small the market is for researchers as authors with regard to communication vessels for their original research in the field of visual arts.

The editor indicated that they often do not have enough submissions to accommodate a full journal. *Image & Text* is published per issue and not article by article. They therefore often need to ask researchers to write. They also cannot show bias to their

own academic institution's researchers – the accreditation guidelines by the Department of Higher Education and Training indicate that there needs to be representation from various institutions (no more than 49% from a single institution) (Van Eeden, 2014).

Prof. Van Eeden indicated that the journal production functions are fulfilled entirely within the department. The designer has been doing the layout and design of *Image & Text* since the first issue of the journal, and all the language editing and design work is done within the department. The journal is therefore very dependent on the department's employees that keep it going.

Since its first publication the process has become much more streamlined. Manuscripts are being tracked and the journal has developed its own style guide. All the processes are however still dependent on manual input.

The journal has a unique look and feel in order to appeal to its esthetically focused readership. The whole of the editorial board prides itself on a high quality publication of which all the articles are carefully selected with the help of peer review and all language edited.

iii) Audience and client segment

Prof. Van Eeden indicated that the market that reads the journal is specialised and also those researchers that publish in the journal.

The publication currently appears bi-annually (possible due to electronic publishing). Issues can be specialised, in other words dedicated to a conference or a special event (for example a themed issue dedicated to an architecture conference hosted by the University of Johannesburg in 2014) or be more general, where it is the responsibility of the editor to make sure that there is a variety of articles in the publication.

The journal addresses a specific research community in order to encourage discussion that is focussed around visual design and culture. As indicated previously the journal also publishes a mix of authors, thus not being biased to researchers from its own

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institution. The editor feels that it is very important to also introduce new authors' research in this field of study in combination with established researchers.

When asked about the number of readers the editor indicated that they do not track usage of the journal because this is not functionality that is easily available as it was not built into the website.She believes that the readership is small in the sense that it will only be individuals interested in the specific subjects who engage with the content. In other words readers may only read one article from a specific issue.

Special issues are sometimes requested by associated departments from other higher education institutions. These issues would have guest editors who need to take on some of the responsibilities that the editor will normally fulfill.

The journal has never made opportunities available for advertising because their focus has never been to be financially viable and there is no one to administer this function.

iv) Value proposition

The client segment identified in the previous section consists of a very specific reader as well as researcher as author. Also included are departments or institutions requiring a communication vessel for their specific event.

These client segments all rely on a high quality publication to answer their specific needs. The publication therefore incorporates peer review as well as language editing and a very esthetic layout and design component in their publishing process.

The readership of the title (as readers and also as possible future authors, contributing to this title) are esthetically inclined and therefore place a lot of focus on the look and feel of the publication. The content should therefore be more than factual but also be presented in an visually pleasing manner.

The range of publications catering for this market is very limited. Researchers are therefore encouraged by their affiliated institutions, research supervisors and their peers to publish their work in this high quality journal. The journal is also accredited

by the Department of Higher Education and Training. The editor believes that the journal has the reputation of a high quality publication within the research community that it serves (Van Eeden, 2014).

The journal does not outsource any of the publication functions. Production such as language editing and layout is all done by staff from the department on a volunteer basis.

The editor indicated that the journal values contributions from young, up-and-coming authors in the subject fields. Students from their own department are encouraged to submit their papers to *Image & Text* for publication.

v) Core activities and resources of journal

As indicated above the journal is published by the Department of Visual Arts of the University of Pretoria. This affiliation allows for indirect institutional subsidy publishing.

The journal has an editor served by an editorial board of between three and five members. The editor does the language editing as well. There is a publishing assistant who marks up the manuscripts for the designer. The designer has been with the journal since the first issue and has, with recent issues, delegated the design work of the journal to designers within the Department of Visual Arts, but still oversees the process.

A web designer is responsible for making sure the content is available on the journal's website. This individual is also from the ranks of the Department of Visual Arts.

The design of special issues is occasionally outsourced, depending on the needs of the institution or individual initiating the special publication.

vi) Distribution channels

Although the journal was originally supplied in printed format to the subscribers, the journal is now only available in an open access environment via the website of the

journal and also through *Sabinet Reference*, where a small subscription fee is charged. The distribution of this journal is therefore electronic.

For special editions printing is usually considered depending on whether funds are available.

vii) Income streams

The journal has no income streams except for the annual payout received from *Sabinet*. This has however not been a concern to the editor, because the publishing functions associated with making the journal available have always been made available through the University. These include time, equipment such as computers, internet, hosting of the website, et cetera.

viii) Editor's general comments

The editor indicated that they have been approached by various international publishers to make the journal part of their collection and even to merge the journal with another title, but she still believes that the journal has a very specific communication function to fulfill, due to the subject focus of the title.

She realises that the journal cannot sustain itself in the current workflow, as for all parties concerned, no payment is offered and these costs are simply absorbed by the Department of Visual Arts. She also realises that should she retire or should they lose their designer the journal may not continue, i.e. there is an over-dependence on specific individuals (a common problem for volunteer-driven initiatives).

The editor indicated that the online environment does not allow them to implement all the design elements that they employed in the printed edition because of issues with displaying PDFs and on-screen reading. She admitted that this is a big part of the journal's identity, and believes that should the title be absorbed by an academic or commercial publisher, be it local or international, the little bit of this design identity that is left will surely be lost. It is however also true that they have not entirely explored

whether these design elements can be improved upon with another publisher, simply because this is not an option that they wish to consider.

She indicates that she has many questions about how the open access environment can allow their title not only sustainability but also profitability and admits that this is not something that she has investigated in-depth, due to the fact that she has so many other responsibilities.

Image & Text is an important publication due to the specific researcher (as author) as well as reader that it caters for. The business model is however not a sustainable one. It was therefore important to include this in this study, admitting that even if the journal continues publication it does not fulfill the criteria of a sustainable business model.

It is also an important illustration of how small society publishers or journal editors can be hesitant to approach or consider partnering with an international or even local publisher due to fear that their title will lose its unique identity and simply become part of a much larger collection.

4.2.3 *Medpharm Publications*

Medpharm Publications (hereafter referred to as *Medpharm*) is a specialist medical and pharmaceutical publisher, publishing (at the time of the interview) 10 journals falling within various medical and pharmaceutical specialist fields. These titles make up 39 issues annually.

Medpharm makes their journal articles available on individual journal websites (hosted by AOSIS) and has print editions for every issue which are distributed to subscribers and members of the societies with which the journals are affiliated (as a membership benefit). The electronic version is therefore published in a gold open access environment whereas the print editions still follow a subscription model. The publisher therefore has a hybrid business model.

The researcher found this publisher to be a valuable inclusion due to this diverse approach. At the time of the interview the publisher had just started negotiations with an international publisher. This agreement would ultimately place the original research articles published by *Medpharm* in a gold open access environment where the electronic version of the article is the version of record for the article and the print edition becomes secondary to that which is available in the electronic environment. This migration will be discussed as a separate case study at the end of this chapter.

The researcher interviewed the company's director (Greeff, 2013) and these findings were supplemented with a desk study of documents made available to the researcher by the publisher.

i) General background and information on publishing activities

Medpharm has been in business for 25 years and is a well known name in the medical and pharmaceutical industries. The publisher publishes 10 academic journals, six of which are accredited by the Department of Higher Education and Training (DHET). They are all published on behalf of academic societies as indicated in Table 4.1.

Table 4. 1 *Medpharm* **journal titles and the associated academic societies**

Title	Academic societies
South African Family Practice (SAFP)	SA Academy of Family Physicians (SAAFP)
Southern African Journal of Anaesthesia and Analgesia (SAJAA)	SA Society of Anaesthesiologists (SASA)
Southern African Journal of Infectious Diseases (SAJID)	Federation of Infectious Diseases Societies of South Africa(FIDSSA) South African Society of Travel Medicine (SASTM) South African Society of Paediatric Infectious Diseases(SASPID)
Journal of Endocrinology, Metabolism and Diabetes of South Africa (JEMDSA)	Society of Endocrinology, Metabolism and Diabetes ofSouth Africa (SEMDSA)

	Diabetes Education Society of South Africa (DESSA) National Osteoporosis Foundation (NOFSA) Lipid and Atherosclerosis Society of Southern Africa (LASSA) Paediatric and Adolescent Endocrinology and DiabetesSociety of South Africa (PAEDS-SA) South African Society for Obesity and Metabolism (SASOM)
Southern African Journal of Gynaecological Oncology (SAJGO)	South African Society of Gynaecologic Oncology (SASGO) South African Society for Clinical and Radiation Oncologists (SASCRO)
South African Journal of Clinical Nutrition (SAJCN)	Association for Dietetics in South Africa (ADSA) Nutrition Society of South Africa (NSSA) South African Society of Parenteral and Enteral Nutrition(SASPEN)
South African Pharmaceutical Journal (SAPJ)	Pharmaceutical Society of South Africa (PSSA)
South African Pharmacist's Assistant (SAPA)	Pharmaceutical Society of South Africa (PSSA)
Wound Healing Southern Africa (WHSA)	Wound Healing Association of South Africa (WHASA) SA Burn Society (SABS)
Transactions: Journal of The Colleges of Medicine of South Africa	The Colleges of Medicine of South Africa (CMSA)

Each of these journals has an editorial board and editors that are actively involved. All the articles are available in a gold open access environment and the print edition is distributed to society members (as a membership benefit) as well as a small number

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of individual subscribers to the print edition who are mostly overseas. Printing and distribution is made possible through advertising income for the print edition.

The initial motivation for making the titles available in an open access format was to attract advertising for the print edition and also to gain readership in this specialised market. But this interview was conducted during a time of change for this publisher. The publishing process was originally focused on a traditional print subscription model, together with an advertiser pays model. The motivation for open access publishing has become one of making high quality, subject specific research available to a larger audience. Therefore addressing the needs of the research market it serves as well as the researchers as authors publishing in the journals. This migration will be discussed later in this chapter as a separate case study.

ii) Associated publishing process

Printed versions

At the time of interview *Medpharm* had the print edition as the copy of record and therefore waited for the print edition to be published before content was made available online. The publisher therefore conformed to a traditional subscription publishing model.

Dr Greeff indicated that the whole publishing process is cumbersome. *Medpharm* prides itself on high quality, peer-reviewed content and the creation of such content takes a concerted effort from the publisher and can be very labour intensive. He indicated that academic societies, and even the editorial boards of a journal, do not always have a clear understanding of the publishing process and the expertise required to put together a high quality publication. The publisher therefore has the important role of contributing publishing expertise such as layout and design, language editing, house style editing and printing and distribution expertise to ensure that the vehicle through which the society communicates to their members is of a high standard.

Medpharm makes use of the Open Journal Systems (OJS) platform as their publishing tool. Dr Greeff believes this software streamlines the processes and workflow. It does however not eliminate the human involvement of tracking and following up on manuscripts, etc. The software makes it easy for all parties involved with the publication to see exactly what the status of articles is and where in the publishing process the articles are at any given time.

All the original research articles published by *Medpharm* are peer reviewed (through a double blind peer review system). Reviewers are assigned by journal editors and section editors. Peer reviewers are not paid. Journals also include review articles which are commissioned by Dr Greeff. Authors of these contributions are subject specialists in the specific fields and are paid for their articles. In most cases the commissioned articles are not peer reviewed but Dr Greeff may request a subject specialist to evaluate the article. These reviewers are paid on a case by case basis.

All article types and any aditional content for an issue is copy edited by a language specialist according to a style guide. Dr Greeff also does an in-depth content and factual edit of each and every article before the journals go to print.

Sometimes reprints of specific articles for special purposes such as conferences or the launch of new medication are published. These are usually sponsored by an advertiser. Some issues are dedicated to specific events such as conferences or forums.

Electronic versions

Once the journals are sent to the printers they are also made available online in a gold open access environment. These are in PDF format and an exact duplication of the print publication but the online version excludes the advertisements.

All of the publication functions are handled by *Medpharm*, including the upload of the articles to the OJS websites.

iii) Audience and client segment

When asked about the individuals or groups who derive value from the publications Dr Greeff identified the following:

- Editor and academic society
- Advertiser
- Reader
- Future researcher
- Author as researcher

Dr Greeff indicated that the journals all function as the voice of the various academic societies that they represent. The publisher is therefore very much in touch with the need of the society when compiling an issue. Each publication has a very specific research interest and the bulk of the print distribution goes to the society members, who are also specialists within the associated field. An average print run is approximately 3 000 copies per issue where the highest is 6000 and the lowest 1500.

The initial motivation for making the articles available in an open access environment was to attract advertising. Dr Greeff indicates that this is a very large part of the *Medpharm* business. Articles are occasionally commissioned solely because a client has a product that they wish to advertise. Some articles will also be reprinted with a specific product focus. Medical advertising has however in recent times become much more regulated and it is not that simple to obtain advertising for all the publications. Budget constraints of pharmaceutical companies have also taken a toll with the consequence that the print editions can no longer be sustained on advertising income alone.

The advertiser is guaranteed a very specific audience. The distribution is ABC (Audit Bureau of Circulation of South Africa) audited on an annual basis to validate the distribution of the print editions. Due to the fact that the largest portion of the print run goes to the society members the pharmaceutical companies who advertise in the journals can also identify and profile the readership very accurately.

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The electronic version of the journal, however, excludes the advertising. The articles are made available on the individual OJS websites for every journal and also through Sabinet. At the time of interview it was still in the Sabinet subscription model but has since been moved to their open access collection. The electronic versions therefore cater to the academic community which include readers as future researchers. Dr Greeff indicates a clear understanding that the growth of the journal is dependent on the submission and usage of high quality articles and this cannot be achieved in the manner in which the journals are currently presented to the open access environment. Even when they are open access they are not highly discoverable and thus do not encourage academic discourse beyond their specialist fields.

iv) Value proposition

Dr Greeff identified groups or individuals as the audience or client segment in the section above. The publisher offers them the following services:

The editor or academic society has a very knowledgeable publishing house that coordinates all the functions of the academic publishing process on their behalf. The publisher also takes responsibility for the advertisements sold and placed in the print publication. The publisher works closely with the society to plan every issue and also makes issues available for specific conferences. Membership of the applicable society includes the subscription to the associated journal. The distribution thereof is dealt with by the publisher.

The society requires such a formal publication process as a stamp of quality to ensure that the research they publish is relevant in the current scholarly research environment. The society also wants the research to reach the relevant market or intended reader.

In the interest and promotion of academic discourse, the society and editorial board of the journals, also want the research to be available to those who may not subscribe to the print publication. All the articles are made available in an open access environment upon publication of the print edition. Dr Greeff however believes that the current platforms are not sufficient because discoverability is still limited.

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The medical community has continuing professional development (CPD) associated with their society membership. CPD programmes require registered professionals to comply with specific requirements on an annual basis working on a point system. When writing an article, reviewing an article or filling out a questionnaire based on a specific publication, professionals can obtain points. *Medpharm* validates authorship, co-authorship and reviewing of articles on behalf of the journals and also coordinates the setting of questions for those titles that have a CPD programme. They also liaise with the service providers to make these questions available on various platforms. CPD questions are included in the print publications and also made available through CPD platforms (depending on the publication). *Medpharm* handles the registration of the CPD programmes associated with the publications on behalf of the journals.

When consulting the original research published by *Medpharm*, the reader is ensured a high quality article which has gone through both a peer review process as well as other quality control measures and can trust the content to be valid and correct.

The advertiser has a guaranteed audience for the content they wish to make available. The advertisement may appear in a special conference issue of which all the attendees receive an issue in their conference bag and for regular issues the advertiser is assured the society members as readership. The activities of the society as well as the publisher therefore increase the reach of the article. The advertiser can also make use of the publisher's competencies to publish a reprint edition of a press release or article for the purposes of special events such as conferences or the launch of a new medication.

Dr Greeff believes the role of the publisher cannot be left out of the production and representation of a high quality scholarly journal. He believes that South Africa has exceptional researchers which the societies and their journal publishers should strive to retain. He indicated that the involvement of prestigious reviewers and researchers from abroad should also be encouraged and stated that this can only happen if the journal is presented in such a way that the international scholarly community will take notice of it. He acknowledges that the current (at the time of interview) business model followed by *Medpharm* may sustain the journals (albeit with difficulty) but will not grow

the journals with regard to international recognition and prestige. How he intends to address this will be discussed in a separate case study later in this chapter.

v) Core activities and resources of the publisher

In order to answer the needs of the identified audience the publisher fulfills various functions which will be explored in this section.

Dr Greeff indicated that the whole of the publishing process is fulfilled by *Medpharm*, including an extensive quality control function which includes peer review, language editing, specialist layout and design and other quality control activities.

The publisher makes use of OJS (Open Journal Systems) as a workflow tool for their processes. The publisher coordinates the peer review process. Language editing and design is outsourced to freelancers (who have all been working with the company for many years). The final quality control is however dealt with in-house. *Medpharm* also coordinates the whole printing process. The publisher has two sales representatives who sell advertising space in the print editions of the publications.

All of the steps associated with the publication of a journal issue have financial implications which are carried by *Medpharm*. At the time of the interview the only contributions made by the academic societies were the membership fees which were attributed as subscription to the journal. Journals therefore generate funds through the advertising income which has become more and more difficult to obtain in recent times (as discussed in the section above).

In the discussion with Dr Greeff it became very clear that relationships within this research community are very important. The needs of the society should be acknowledged in the service provided by the publisher. When commissioning articles the requirements of the advertisers should be considered without compromising the mission and vision associated with the journal. Dr Greeff also spoke of the printing and distribution of the journals which has been handled by the same printers for as long as these journals have been printed. The positive relationships that Dr Greeff has built

over many years in the industry are a very valuable asset to *Medpharm* and directly related to the everyday functioning of the publisher.

vi) Distribution channels

The print edition of the journals published by *Medpharm* reaches society members and subscribers by mail. Special conference issues are inserted into conference bags for pre-defined conferences. All the articles are made available on the individual journal websites at the time of publication in PDF format.

Advertisers or researchers sometimes request reprints of articles together with advertising for special print runs. These are distributed by the client (which could be the advertising agency or the society) according to their specific requirements or coordinated by the publisher at a fee for the client.

vii) Income streams

Medpharm Publications has a firm grasp on the individual costs and income for every issue of every title. Dr Greeff indicated that this is necessary due to the fact that you do not want one title to not be sustainable on its own.

He indicated that there is some financial involvement from the governing society of the journals but that the publisher still carries most of the publishing costs and consequently also absorbs any losses.

Advertising income is a large portion of the income for every title. This includes reprints, which contributes a substantial amount (approximately 45% of the income). The publisher does not make a lot of money from subscription income as most of the subscriptions are covered by membership fees that go to the societies.

The publishing house also receives an annual payout from Sabinet, for their subscription income for the *Medpharm* titles.

At the time of interview these income streams supported the open access availability of the titles.

viii) Publisher's general comments

Dr Greeff is clearly positive about open access scholarly publishing. He believes that researchers as authors want their work available as soon as possible, without compromising the quality of the publication. Impact factors and increased citations are important in the academic field. He is however very aware of the fact that for a publication to not compromise the high quality there needs to be substantial financial input.

He believes that the scholarly community supports the notion of open access but that an entity such as an academic society does not have a grasp of processes associated and costs involved with publishing an academic journal of high standard and distribution. The role of the publisher, with regard to the coordination of peer review, language editing, design and layout expertise of article representation and other production functions, is very important for the sustainability and growth of an academic journal.

He continues that the scholarly publishing industry in South Africa has a lot to learn about the electronic environment and possibilities of academic research associated with open access scholarly publishing. He believes that collaboration within the scholarly publishing community will be a driving force, specifically among academic publishers (thus sharing some of the time and labour-intensive functions such as language editing and layout).

Dr Greeff acknowledged that although the quality of the journals and the research represented in them, is of a very high standard, the platforms on which they are made available are not highly discoverable. He also indicated that advertising income is not something that can sustain an academic journal in the long run. At the time of the interview he was exploring various other options for open access business models which will be discussed in a separate case study later in this chapter.

4.4.4 *EE Publishers*

EE Publishers publishes four journals in the engineering and information technology fields. These are all available open access from the publisher's website and also in a vast range of other media. One can also subscribe to the print edition of the journals.

EE Publishers make their titles available in a gold open access environment by following a hybrid model where the publishing initiatives are funded by other commercial activities. The researcher included this publisher because the journals published include technical as well as semi-technical articles which follow the same publishing process as a peer-reviewed academic article. The journals however have a magazine-like look and feel and are published as business-to-business publications providing the opportunity for businesses within a specific technical field to communicate with others within that same niche market. This publisher therefore facilitates communication to peers within these specialist technical fields.

The researcher conducted a desk study as well as analysis of the actual publications to collect the data for this section (*EE Publishers*, 2014). The owner of the publishing house was not available to take part in an interview.

i) General background and information on publishing activities

All four titles published by *EE Publishers* offer communication opportunities to associations, councils and societies and are technically specialised, communicating to a pre-defined, niche audience. The content of these titles is technical or semi-technical and presented as a business-to-business communication publication, aiming to keep the intended target audience up to date with new and developing technologies, "relevant and topical industry, company, project, product, people, event and technology news, views, comment, opinion and analysis, focused on the various target sectors and readership" (*EE Publishers*, 2015). The titles and their associated councils and societies are listed in Table 4.2.

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Table 4.2 *EE Publishers*' titles and the associated councils and societies

Title	Councils and societies
EngineerIT	IEEE South African Section; National Laboratory Association; South African Council for Automation and Control; South African Electrotechnical Export Council; National Metrology Institute of South Africa; Society of Automation Instrumentation, Measurement and Control; Institute of Information Technology Professionals South Africa; Wireless Access Providers' Association; Society of Telkom Engineers; FTTH Council; Information Technology Association; Copper Development Association Africa; Association of Distributors and Manufacturers of Electronic Components
Energize	IEEE South Africa Section; Copper Development Association Africa; The South African National Energy Association; Cigré in Southern Africa; Southern African Association of Energy Efficiency; Sustainable Energy Society Southern Africa
Vector	Electrical Contractors' Association of South Africa; Institution of Certificated Mechanical and Electrical Engineering; Illumination Enigineering Society of South Africa; ElectroBase South Africa; South African Flameproof Association; South African Electrotechnical Export Council; South African Association of Energy Efficiency; Copper Development Association of Africa
PositionIT	Geo-Information Society of South Africa; South African Geomatics Institute; Institute of Mine Surveyors of South Africa

Some of these associated bodies are duplicated. This is because their market interest are applicable to the editorial focus of more than one journal.

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ii) Associated publishing process

The titles all conform to the simplified publishing process developed by the researcher. The technical and semi-technical articles are in some cases peer-reviewed, but they are mostly placed (or denied placement) at the discretion of the editor or the editorial team.

The content of the journals is not only technical as the titles aim to include a less academic audience in their readership as well. Publications therefore include news and snippets relevant to the intended target audience.

The editorial policy for every title is clearly defined. The target audience is also mentioned in detail for every title. Contributors to a title (whether they be an industry expert writing a technical article or an advertiser) are informed very specifically about who they will be addressing in the issue.

EE Publishers has also devoted extensive resources towards research addressing the demographics together with the need of the associated readership for every title and these details are also available via the publisher's website.

All four titles follow an advertiser pays model. The advertising options cater for almost any kind of advertising in any medium, and are clearly indicated on the website of the publisher for every title.

Subscription to the print edition of the titles is also available. This is however not the main source of income for the publisher.

All four titles aim towards a business-to-business type of communication for professionals in the associated fields. These journals are therefore available as tools to keep industry leaders and specialists informed about developments in the associated fields.

iii) Audience and client segment

The client segments that derive value from these publications and the website of the publisher are:

- the clearly defined target audience of every title which include businesses in the specific sector as well as individuals associated with the various societies and councils

- the advertisers

- the pre-defined target audience which are made up of members of the associated societies and councils, which may be professional and also academic

- the industry expert (researcher as author) who wishes to publish a relevant article addressing the above readers

- the associated society that has an avenue to publish in and communicate through and also a medium to make relevant information available to their society members

- the business that functions within these technical circles and wishes to communicate or obtain relevant information within the sector.

The journals are all ABC audited and have an average circulation of 5 025 per issue. These include subscription print copies as well as the copies posted to members of the associated societies (which is in most cases done free of charge). These numbers indicate a substantial distribution to the target audience.

Editorial content planning and the selection of the topic focus of the specific issues are done ahead of time and made available to all the parties mentioned above through the publisher and journal websites.

iv) Value proposition

Every issue of a title is compiled with the very specific target audience in mind. Contributors know exactly who receives these publications and consequently who they

are addressing. Content is therefore specialised and relevant to this pre-defined reader.

Even though some of the articles are technical or semi-technical, the journals aim towards a more magazine-type feel. The content is therefore written and edited in such a way that it is easily readable and thus accessible by everyone included in the target audience. The societies and councils represented by these journals include technicians and other workers who, although highly skilled and professional, may not be so academically inclined. If the content were written too technically or too academically these individuals would automatically be excluded from the successful communication of the message.

The reader is also able to access the content in various ways. A subscription option is available for the print editions. The content is available free of charge in the digital environment through the publisher's website, or on various devices (such as an iPad). The publisher websites offer browser-specific access that allows for the user to simply click on the issue that they wish to read and that issue will open in whichever format is best suited to the device.

The website of the publisher clearly aims to create a community of interest for every title. Forums are available and the contact details of the editor and editorial team are provided as well to encourage discussion.

EE Publishers' publishing model is built on an advertiser pays foundation. The advertiser is therefore also part of the client segment. All four publications allow various advertising options and combinations allowing advertisers options for how and through which avenues they wish to address the target market. The editorial plan for issues is also made available to advertisers allowing them to plan their advertising campaign ahead of time.

The pre-defined audience guarantees the advertiser a specific readership as the journals are distributed to members of the associated societies and councils.

v) Core activities and resources of the initiative

The publisher employs the following groups of individuals:
- Administration
- Sales
- Editorial
- Production
- Events management

The publisher has a sales force of eight individuals who are devoted to marketing and selling advertising space in the journal editions and also on the publisher website, newsletters and journal websites.

EE Publishers also has their own design team (*EE Production*). This was initially made available to allow advertisers to not have to send pre-designed advertising files, but in recent years this team has developed into their own entity, allowing the company to do additional design work as well. The design team produces the journals and also:
- Books, magazines and newsletters
- Advertisements and advertorials
- Catalogues, leaflets, brochures and flyers
- Posters and other display material
- Logos, business cards, folders and stationery
- Other promotional materials.

This leg of the business therefore caters for the existing client segment of the publisher, making their specialised services available to the industry.

The publisher also offers help and organisation skills in event planning. The publisher may be seen as situated ideally for such a function in that it links together various sectors of the same industry and can easily fulfill a coordinating function.

All of the publishing functions are therefore dealt with in-house. The printing is outsourced, but done with the same company every time (with regard to the journals).

vi) Distribution channels

The print edition is distributed via mail and falls within a subscription model. Print editions are also distributed on request to members of the associated societies, free of charge. According to the ABC audit the print run is very substantial.

The electronic version of the journal – or e-Zines, as the publisher refers to them (EE Publishing, 2014) – is available through the following avenues:

- The publisher's website (as a PDF download)
- Versions compatible with Apple, Android, Blackberry and Windows PC

All the electronic options are free of charge and therefore exist in a gold open access environment.

vii) Income streams

The publisher's main income is derived from advertising. As indicated previously, there are various options available to any advertiser allowing them to advertise as much or as little as they wish. They can advertise on the website, in the publisher's newsletter, via the various applications available for access to the title (where allowed) and also in the print edition of the journal. Advertisers are also informed about advertising options at the various events hosted or organised by the publisher's events company.

The publisher also has a print subscription income as well as additional design services and events coordinating.

viii) General comments

EE Publishers was included in this study by the researcher due to the specialised nature of their publications and the way in which they address a pre-defined audience. The content of the titles published is dealt with as academic articles, but the nature of

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the publication is not that academic. The way in which the publisher embraced technological advances and the opportunities offered by digital publishing as an avenue for open access and at the same time provided additional opportunities for advertising is an important example of how an open access model can be made sustainable through addressing the needs of a pre-defined client segment.

The publisher also evolved over time and used their expertise to provide additional services to the existing target market(s).

It is also interesting to see how the publisher's website creates a community of interest for the target markets of the journals. This allows for targeted communication not only through the journal but also through the website.

EE Publishers is an example of a journal publisher which can sustain itself on advertising income whereas *Medpharm* can no longer sustain the journals by only selling advertising. This is due to regulations governing the advertising of medicine. It is therefore important to consider that the field of publication may also be more appropriate to a specific business model.

4.4.5 The Academy of Science of South Africa (*ASSAf*)

ASSAf is the official national Academy of Science of South Africa. The Academy of Science of South Africa Act (Act 67 of 2001) came into operation in 2002. *ASSAf* started as a small organisation but is a well-established academy today (www.assaf.co.za, 2014).

Alltough the Academy publishes the *South African Journal of Science*, it was included in this study for its influential role in open access journal publishing in South Africa. *ASSAf*'s overall objective is to "promote and apply scientific thinking in the service of society" (*ASSAf*, 2015). *ASSAf* publishes various reports and policy guidelines, which are all funded by the South African government (specifically the Department of Science and Technology and the Department of Trade and Industry). For the interest of this study *ASSAf*'s involvement in open access publishing through their group peer

review of scholarly journals in various academic fields and the publication of the *National Code of Best Practice in Editorial Discretion and Peer Review for South African Scholarly Journals* were investigated. In this regard the focus of the *ASSAf* initiative is on the quality of scholarly publications. As established in Chapter 3, the quality of an open access scholarly publication is of cardinal importance when considering the continued growth of the journal.

ASSAf is not a traditional scholarly publisher but their scholarly publishing unit is the governing body of SciELO (Scientific Electronic Library Online) South Africa, which hosts various prestigious South African journals that have gone through the rigorous evaluation process. This discussion was therefore focused on the SciELO platform as a host for South African gold open access journals. This database and the activities associated with it are funded by the South African Department of Science and Technology and endorsed by the Department of Higher Education and Training.

The focus of SciELO is to strengthen journal evaluation and accreditation systems in South Africa (SciELO, 2014; Veldsman & Gevers, 2014). Such a standardised evaluation and accreditation system could allow the entire research community to have access to high quality peer reviewed research articles.

The researcher interviewed the head of the scholarly publishing unit (Veldsman, 2013) and combined these findings with a desk study of associated documents and web pages as well as observations made through attendance of the National Scholarly Editors' Forum in 2014.

i) General background and information on publishing activities

Ms Veldsman sees *ASSAf* as an "aggregator publisher" (Veldsman, 2014). She claims this honorary publisher title due to the fact that many of the journals available in this open access environment, would not have been available had it not been for *ASSAf*'s involvement. Ms Veldsman also indicated that they are not limited to specific academic fields, and make titles available from various subject collections.

All the articles are made available in a gold open access model and are free of charge to the user. It is also free to publish for the publisher or society who governs the journal, but the journal needs to adhere to certain quality standards, which are evaluated by *ASSAf* before inclusion. The initiative was initially funded to make research more accessible and visible to the research community which aligns with the objectives of *ASSAf*.

ii) Associated publishing process

When presented with the simplified scholarly publishing model by the researcher, Ms Veldsman indicated that they do not conform to the traditional scholarly publishing model. As an aggregator they are however involved with the distribution, accessibility and use of the journals and make valuable and important contributions towards the quality of journals by setting specific guidelines and standards.

The scholarly publishing unit of *ASSAf* is responsible for getting the published articles on the SciELO database by tagging and indexing the text. When addressing the challenges experienced in the workflow Ms Veldsman indicated that one of the functions of the workflow is to include very detailed XML markup in the content in order to make it searchable. This process is manual, and training individuals to do this specialised work is very challenging. Quality control is also performed on these files. The process is therefore very time consuming and labour intensive.

Ms Veldsman's experience is that journal editors and researchers as authors are very "open" in the sense that they are happy to share information. They therefore do not struggle to receive articles. This indicates that they have the trust and the buy-in of the editors of the journals indexed on SciELO.

The high quality required for content made available on SciELO is very important to *ASSAf* and the research community as a whole. *ASSAf* therefore includes various quality control measures in their workflow. Research articles are received from the editors or publishers and these files go through an XML mark-up process. The files are then checked as well to make sure that all the fields have been included. This is

done to ensure that the full text is searchable by users and a correct reflection of the version of record of the article. All these processes are done manually and therefore the checking of the files is very important. Concequently it takes about three weeks from receipt of articles to having them available on SciELO. The database needs to adhere to various international standards and the content therefore needs to conform to these regulations.

Ms Veldsman indicated that *ASSAf* has very little involvement (if any) with the actual publishing process of the titles that they make available on SciELO. Even the *South African Journal of Science*'s production function (including editing, layout and design, printing etc.) is contracted out to *African Sun Media*. They do however make available a code of best practices for the editors of these journals. The publications included in the SciELO collections should therefore adhere to these standards and maintain a certain level of quality for them to continue to be hosted in this environment (Veldsman & Gevers, 2014). The journals are also audited on a five yearly basis.

All publications of SciELO are accredited by the DHET. Inclusion on SciELO is recommended to the journal editors by *ASSAf* after the evaluation process.

iii) Audience and client segment

Ms Veldsman believes that the whole of the research community and role players derive value from an open access environment where the research made available is both free to access as well as of a high quality standard. The reader is therefore not predefined in the business model of this initiative due to the fact that they want the research to be available as widely as possible.

SciELO is also available on the World of Knowledge platform which contributes to the reputation of high quality associated with these titles. Publications made available through SciELO are also considered for indexing on Web of Science, but this is not guaranteed.

Ms Veldsman believes that SciELO promotes the citation of articles due to the wider reach of gold open access. The platform does however not currently make available usage statistics that indicate citation or downloads of articles. There is therefore no evidence for this statement.

The quality of the journals included on SciELO is what is endorsed and promoted by *ASSAf*. All the titles that are included in the SciELO collection are evaluated by a panel and the journal editor receives a report once this evaluation has been completed. It is interesting, however, that not all journals choose to be on SciELO. This may be due to the fact that they are dependent on their subscription income for the continuation of their journal (journals on SciELO are allowed to still sell print subscriptions but not electronic subscriptions).

Ms Veldsman stated that the audiences deriving value from *ASSAf*'s involvement in scholarly publishing and the SciELO platform include:

- The publishing body of the journal (which can be the society or the editor);
- The research communities who are assured the quality standards valued by *ASSAf* and SciELO; and
- The researcher as author.

The motivation and ideology behind SciELO therefore aligns with the overall objective of *ASSAf*'s Act in circulating scientific output to the benefit of society. The researcher is however concerned that there is little evidence to support the contention that this open access database does infact reach this goal seeing that there is no evidence available with regard to citation and that, in most cases, the version of record is not the version that is available on SciELO. The SciELO platform is also not very sophisticated in its search functionality and user involvement, when compared to other aggregators such as *Sabinet Reference*.

iv) Value proposition

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ASSAf offers accredited academic journals a stamp of quality when the journal is made available on SciELO (and consequently on the World of Knowledge database). There is value addition due to the fact that the extensive XML markup performed by *ASSAf* makes the research articles available for indexing (by various third party data vendors), available for harvesting in an open access environment, and retrievable for readers and future researchers, and this in theory increases the visibility of the titles. The journals included in this database are therefore placed in a wider research context, reaching an audience that may have been unreachable through a print publication or subscription.

Ms Veldsman pointed out that the SciELO citation index is available to anyone visiting the SciELO platform. She added that these statistics are easily accessible and easily usable by anyone, depending on their needs. The researcher evaluated the statistics available and was concerned that the data presented did not make sense. Confusing terminology was used and statistics were provided on searches perfomed and articles viewed, which did not indicate the usage of an actual title but of the whole database. There is therefore simply an indication that the database is used. The importance of article quality is not evident in the structure and interface of the SciELO website.

Ms Veldsman believes that *ASSAf* as aggregator with the SciELO platform fulfills an important role within the sholarly research community of South Africa by making specific South African journals available to researchers. These publications are evaluated and approved for this database. She believes that many of these journals would not have been available electronically at all had it not been for the SciELO database. This is however incorrect seeing as many of these titles are available on *Sabinet Reference* where they are integrated into a larger research context with a much more sophisticated user interface than that of SciELO South Africa.

v) Core activities and resources of the initiative

ASSAf receives funding from the Department of Science and Technology and is therefore a government-funded initiative.

ASSAf's scholarly publishing unit consists of a small number of individuals whom are highly skilled. The XML markup function is outsourced while the quality control of that function is done in-house. They do not host the SciELO platform themselves and therefore have technical support for the platform with the hosting company.

Ms Veldsman believes that the reputation of an initiative such as *ASSAf* and SciELO is of high importance. The organisation should communicate the value that they associate with prestigious, high quality publications at all times. Through the activities and publications of *ASSAf*, and the review of their objectives, it is clear that they aim to align their conduct with using science to the benefit of society. It is however not clear if this is achieved with regard to open access scholarly publishing.

Ms Veldsman believes that the SciELO South Africa name still needs to gain some prestige in the research community. She believes this is partly due to the fact that the platform itself does not communicate academic prestige or the search functionality available. She explained that this is simply because they are dependent on SciELO Brazil's development team to roll out any new developments and functionality to the South African section. *ASSAf* therefore has no ability to make any changes or enhancements on their own. She also believes that there is still a large percentage of the South African scholarly community that believes that gold open access indicates a sub-standard publication.

vi) Distribution channels

Titles available through SciELO are available on the SciELO platform itself, harvested by Google Scholar, World of Knowledge, PubMed (the medical journals only) and also Sabinet. Upon investigation the researcher noted that Sabinet does not harvest the titles from SciELO and these are therefore a duplication of titles.

SciELO makes the articles available in a searchable, indexable format through XML markup processes and these articles are available in an HTML format (which is not actually very readable on screen) as well as a PDF document (which is what was

received from the publisher without any enhancements). Users can email the article and there is guidance on how to cite the article.

The researcher requested usage statistics and was referred to what is available on the website. The researcher found these to be very basic and not very user friendly.

The researcher is also concerned about the fact that the version available on SciELO may not be the version of record (when looking at the XML markup process and the file displayed as XML file).There is also no indication of a persistent link such as a handle system or a DOI (Digital Object Identifier). When addressing these concerns with Ms Veldsman, the researcher was assured that the quality of the original PDF was not hampered in any way and that they believe that the version of record is not that important because "open access is open access" and having different PDFs of the same article available in different places just makes it more accessible (even if these versions may be different) (Veldsman, 2013). This approach was of concern to the researcher, based on the findings of the literature review.

vii) Income streams

ASSAf and therefore SciELO South Africa are funded by the Department of Science and Technology. They do not have any other income streams. This funding is sufficient in running the whole *ASSAf* office (of approximately 15 employees at the time of interview). It is also sufficient to pay for the publishing processes associated with the *South African Journal of Science*. This funding also funds the XML markup service which is contracted to another company. Ms Veldsman indicated no concern that this funding will be discontinued, but this is obviously a possibility as government priorities shift over time.

viii) Interviewee's general comments

In closing Ms Veldsman indicated that she believes that open access does promote academic research. She however believes that in the South African academic publishing context the thinking is still very much geared towards a subscription

publishing model. She also indicated that researchers as authors as well as the small society publishers have more faith in the "big name" international publishers when it comes to making available their content on a global scale.

She continues that the citation increase promised by SciELO is however an indication that open access scholarly publishing is gaining prestige and influence in the scholarly community. As indicated the researcher could not find adequate evidence of this increase.

When the researcher asked her about open access publishing models and the sustainability thereof she indicated that she believes the necessary funds are available in the academic institutions and government departments and other research industries. She however believes that this money is still channelled in the wrong direction. Research funding, for example, is not made available to academics for publication in open access journals (only for subscription-based journals). The funds are available for page fees but not for article processing fees. She therefore believes that a mind shift needs to be made for open access to be sustainable in the South African scholarly publishing context. Since the start of this research study this situation has changed somewhat due to the fact that academic institutions are recognising more open access journals.

Ms Veldsman made a valuable distinction between "research-intensive institutions" and those that are not. She referred to tertiary institutions that publish a lot of research as the first and those that are not focused on research publication as the latter. She highlighted the importance of the buy-in of these research intensive institutions to an open access scholarly publishing environment.

Concern was also raised about the understanding of the scholarly publishing model, with regard to the costs associated with publishing high quality research. She believes that all academics do not understand the valuable service given by the scholarly publishers and the costs associated with the various publishing functions. Until an understanding is established in this regard, researchers will always feel that open access publishing is, in fact, free.

Some publishers or academic societies are now on the world map due to initiatives such as SciELO. These societies are now much more aware of their publishing activities than when they were simply publishing for their own society. She believes that this is a positive influence of open access scholarly publishing.

Ms Veldsman highlighted that for open access to gain prestige and win the buy-in of the research-intensive institutions, some policies will have to be put in place. She indicates that there is still uncertainty with regard to who should be responsible for these policies.

4.2.6 *Taylor & Francis South Africa* in collaboration with *NISC*

The South African scholarly publishing environment has numerous accredited journals that have gone the route of partnering with an international publisher to enhance the reach of their publications. The researcher therefore felt that this would be an important example to include in this study.

The international publisher involvement in the local scholarly publishing environment can take many forms. In previous discussions, for example with Prof. Jeanne van Eeden – editor of *Image & Text* – it was made clear to the researcher that some of these editors are hesitant to partner with international scholarly publishers due to a fear of losing the identity of the journal.

The researcher identified one such partnership – a co-publishing agreement between *NISC* (NISC, 2014) and *Taylor & Francis* – as an important occurrence for inclusion in this study. *Medpharm* approached *Taylor & Francis* South Africa to host the original research articles of six of their journals. A co-publishing agreement was entered into between *Medpharm* and *Taylor & Francis* with *NISC* managing the production workflow of these articles. The researcher found this to be a valuable case study for inclusion as a possible example of the way forward for open access scholarly publishing in South Africa.

The researcher is now the publisher at *Medpharm*, coordinating this migration to the *Taylor & Francis* stable and combined work findings with the attendance of the *Taylor & Francis* Editorial Inaba in 2015. Unstructured interviews with the various role players also provided useful data.

i) *General background and information on publishing activies*

Taylor & Francis is a multi-national publisher publishing more than 4 000 academic journals. They entered the open access market in 2008 announcing the launch of *Taylor & Francis Open.* This platform hosts various gold open access titles. Today, *Taylor & Francis* offers various other open access options as well, namely

Taylor & Francis Open Select, which conforms to a subscription publisher model offering an open access option (as discussed in Chapter 3) and also *CogentOA* which was launched in 2013, offering an open access environment that is focused on the needs of the researcher as author. It is on the *CogentOA* platform where the *Medpharm* titles will be included.

Taylor & Francis has embraced the open access scholarly publishing environment. Content available on their site includes surveys addressing open access issues, indicating that the international scholar has a far better understanding of the various open access licensing possibilities than those in South Africa.

They opened *Taylor & Francis* Africa in 2007. At the time of writing the South African office was situated in Johannesburg and was established to support and strengthen African (including South African) journals, by partnering with publishers and publishing societies to enhance not only the reach but also the quality of their journals. To achieve these goals *Taylor & Francis* set out to establish various co-publishing agreements of which the first was with *Unisa Press* and the second with *NISC*. By establishing such partnerships they acknowledge the expertise of local publishing houses and the existing networks in the South African and African scholarly publishing community.

Situated in Grahamstown, *NISC* initially compiled and supplied bibliographic databases and later expanded their offering to include academic journals. They have also published a few books. *NISC* is also in charge of the African and South African subscriptions to titles that are published under a co-publishing agreement with *Taylor & Francis*. These include their own titles as well as titles published by *Unisa Press*. More titles are being added on a regular basis.

The agreement with *Medpharm* named *NISC* as the publisher to coordinate the production processes for the *Medpharm* original research articles. The process will be reviewed in the following section.

Dr Greeff, the director of *Medpharm*, explored various options of international scholarly publishers who could offer the *Medpharm* researchers and the associated societies a publishing service guaranteeing high quality and enhanced usage statistics, further

reach and opportunities for growth of the journals. He wanted to publish his titles in a gold open access environment within a wider research context. After extensive evaluation he decided on *Taylor & Francis* and negotiations began in 2013.

Dr Greeff regarded author satisfaction as a very important quality of a publisher and therefore valued the objectives presented by *Taylor & Francis* South Africa which include the support and enhancement of research quality and reach within Southern Africa. He understood that as a small South African publishing house, *Medpharm* did not have the capacity to offer their societies and authors the services that a multinational publisher had to offer.

ii) Associated publishing process

The *Medpharm* publishing process for their print editions was discussed earlier in this chapter. Dr Greeff with the support of *Taylor & Francis* devised a business model based on the author pays model that will support the online publication of the peer-reviewed content of the journal.

Other article types included in the print editions will not form part of the responsibility of *NISC* and also not be published on the *Taylor & Francis* platform. The aim was to have the original research articles available online before the print edition and then simply use those as part of the print edition and include the editorial, commissioned articles, press releases and advertising only in the print edition.

Taylor & Francis offered innovative solutions with regard to software and manusript management tools and even the layout of the articles for the online version, which became a tagged document marked up for layout instead of a designed file. *Medpharm* and *NISC* therefore needed to develop an approved template for these articles before work started flowing through the system. The solutions offered by *Taylor & Francis* offered a more automated workflow where human intervention and the possibilities for errors or delays were minimised.

NISC also contracted in the freelance language editor that *Medpharm* uses, to do the language editing of the articles contracted to them. *Medpharm* and *NISC* also

combined their skills to develop an in-depth style guide addressing every design, layout and language element associated with the house style of the journals.

It is evident that the role players in such a collaboration needed some time to define their exact functions and that it would take an initial time investment of trial and error before everything could flow smoothly.

Having the original research articles online before the print edition would allow the publisher to focus on the rest of the content and the advertising included in the publications. The workflow for the print edition therefore in essence remained the same.

iii) Audience and client segment and the value offered to each

When looking at the role players in this agreement the client segment of all the interested parties needs to be considered.

Medpharm made this decision to enhance the services that they provide to the author and the journals' affiliated society. The researcher as author therefore has an article published as it becomes available without having to wait for the printed edition. It is also made available on a platform that enhances the reach of the article and which is associated with a highly recognised international publisher. Automated systems strive to produce a better quality article which will be the version of record according to the DOI.

The academic societies publishing the journal had the advantage of having their title associated with a highly prestigious international publisher. The reputation of the journal therefore benefits and submissions from a wider audience are now possible, due to the wider reach of the journal.

Taylor & Francis South Africa gains the involvement of a prominent South African publisher as part of their open access collection and facilitates valuable collaborations within South Africa.

iv) Core activities and resources of the role players

This co-publishing agreement asks from every involved party that they bring specific skills to the table, otherwise the agreement would not have been considered. It needs to be mutually beneficial to all role players.

Medpharm initiated the negotiations towards this agreement. This publishing house offers six well-established titles and their associated societies to the agreement. Together with the publishing expertise of the publisher they also have the relationship with the society as their publishing partner. *Medpharm* also has a reputation within the medical scholarly publishing community of South Africa which can be built upon in the international context.

By handing over the production function of these original research articles *Medpharm* can focus on their additional activities, for example managing the CPD programmes and offering a service to their advertisers through their print publications. It also opens up capacity for additional publications such as guidelines and supplements.

Taylor & Francis offers the association of high profile, high quality scholarly publications. They offer software and services to *Medpharm* and the associated societies which would not have been available otherwise, such as plagiarism checking software and highly sophisticated manuscript tracking programmes.

In addition they offer *Medpharm* the opportunity to grow these titles on an international platform, where the wider reach will mean more submissions. *Taylor & Francis* also manage the work done by *NISC* on behalf of *Medpharm*.

Taylor & Francis also bring to the table an additional marketing team that will market the titles to potential researchers on an international level and also the capacity to manage the APC payments.

They also provide detailed reports of usage and citation for every journal on an annual basis and also on special request of the publisher or society. They host events such as editor indabas and round tables in South Africa, thus creating a broader forum of interest for open access scholarly publishing.

Applying for accreditation with bodies such as Medline and PubMed is something that is supported within the *Taylor & Francis* responsibilities and no longer rests upon the shoulders of the society or *Medpharm*.

Finally *NISC* offers project management and coordinating services to *Medpharm*. This relationship is also managed by *Taylor & Francis*.

It is therefore clear that such a co-publishing agreement combines the skills of the various role players to ensure a positive outcome for all parties involved. The publications of *Medpharm* would not have been able to enter an international market had it not been for an international partner such as *Taylor & Francis*, and due to their presence in South Africa and their interest in enhancing South African and African scholarship, it was a positive fit for both *Medpharm* and *Taylor & Francis*.

v) Distribution channels

Medpharm will therefore continue to produce their print publications and these will continue to be distributed to society members and subscribers. For these, advertising will be sold and they will include content that is not available on the *Taylor & Francis* online platform.

The original research articles will be made available through the Cogent platform as well as *Taylor & Francis* Open. Consequently these articles will be made available to various third party data vendors and indices.

The print version of the journals will also be made available on a website which is currently in development. These versions will include the advertising and possibly alternative advertising in other media formats. This project is called the "Red Brick

Library" which will house all the *Medpharm* journals and also offer the opportunity for other societies to include their titles on at a negotiated fee. At the time of writing the development of this project was underway.

vi) Income streams

Such an agreement needs to be beneficial to all parties concerned and it needs to be financially viable for this benefit to be evident.

The agreement between *Medpharm* and *Taylor & Francis* sets out very detailed payment schedules incorporating a sum due from *Medpharm*, of which a portion will be subsidised by the particular societies. Over the course of five years income will be generated from the APC payments which will eventually allow the publications to be sustained on their own.

This is however a slow process which will only reap rewards in the long term.

Medpharm also generates income from advertising sales for the print edition as well as for the online editions and other special print projects can also contribute to this income.

Upon implementation *Taylor & Francis* retains a portion of the APCs. This is a motivating factor for them as well to canvass for additional submissions. An initial lumpsum was also paid to them in accordance with the agreed payment schedule.

NISC is renumerated for their services by *Taylor & Francis* and thus indirectly from the journal accounts into which the initial lumpsum was paid.

The agreement between *Medpharm* and *Taylor & Francis* binds both parties for a period of five years, upon which the agreement will be re-evaluated. In turn *Medpharm* had to negotiate individual agreements with each of the academic societies in this regard.

vii) General comments

The researcher has been closely involved with this migration and at the time of writing this study it is still in process. There have been various challenges including all parties getting used to new workflows and the negotiations with the various societies. The workflow has not yet settled into an online first situation, but it does seem to be moving that way.

Positively there is already evidence that the articles that are on *Taylor & Francis* are being viewed, used and cited.

Another challenge has been authors who are reluctant to pay APCs. There is always the option to have these waived, but according to agreements the society will then be responsible for these costs.

The researcher does however believe that this is a very relevant example of how publishers should consider that their revenue streams could change together with changes in the scholarly publishing environment. This was considered by Dr Greeff when he started these negotiations and when he realised that it is not financially viable for a small publisher to try to fulfill all the roles required for a high quality, high impact scholarly publication. Another valuable lesson learnt in this investigation is that it is important to be aware of all the costs associated with each publication before such a migration and agreement is considered.

This co-publishing agreement is an example of how skill sets are combined for a mutually beneficial outcome towards promoting high quality sustainable open access scholarly publishing in South Africa.
The researcher included all the above case studies as examples to investigate and evaluate what is currently the situation of the open access scholarly publishing environment in South Africa. The rest of this chapter will summarise these findings.

4.3 Factors contributing to or hindering sustainable open access publishing in South Africa

Section 4.2 discussed the findings according to every respondent as derived from the interview and/or associated desk study. Section 4.3 will combine the findings from the discussion and conclude which factors are contributing to the sustainability of open access scholarly publishing and also which ones are hindering or challenging sustainable open access scholarly publishing within the South African context.

4.3.1 General background and information on publishing activities

This initial section of the interview focused on the publication offering of the publisher or initiative (depending on the nature of its involvement). Respondents were therefore asked about what they publish in addition to the academic journal/s. The focus of the academic fields in which these publications fall was also identified. The researcher wanted to establish if all the publications fall within an open access publishing model. The motivation behind choosing an open access model was also discussed.

For both publishers, *Medpharm Publications* and *EE Publishers*,their main publishing activities are focused on their journal offering. Both these publishers, however, enhance their offering with additional content. For example, conference proceedings, special events publications, newsletters and supplements to existing titles. *Medpharm* also publishes reprints of research articles offering advertisers the opportunity for exclusive publications. A lot of these additional publications are not available in an open access format, due to the publication need associated with that. Some are sent out free of charge in an electronic format, but to a specific readership. Both publishers also still have a print journal, mostly sent out to professional society members. *EE Publishers* make use of print on demand technology, allowing for smaller print runs. This is also technology used by *African Sun Media*, which is the publishing service provider of *ASSAf*'s *South African Journal of Science*.

The single journal titles as well as the two publishers that were investigated are all focused within their specific academic fields and address a specialist, pre-defined

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research community. All these titles are published in an open access format where the content is available free to the reader. When for example comparing advertising sales and activities for *Medpharm* and *EE Publishers* it is evident that the field in which *EE Publishers* publish has more advertising opportunities. This is due to the regulation associated with the advertising of medication and pharmaceutical products.

The motivation behind making content available in an open access format provided the researcher with important background. Both single journal titles as well as the two publishers, indicated that they wanted the widest possible dissemination of their content. Both *Medpharm* as well as *EE Publishers* derive income from advertising sales and this wide dissemination is therefore an important motivator to advertisers.

Litnet Akademies was open access from the first issue published and even had DHET accreditation before this first issue was available due to the existing following and discourse activities of the *Litnet* website. A gold open access model within the digital environment was therefore the logical choice for this publication. *Image & Text*, however, was initially a print subscription publication. The subscription income was however so low that they could not financially sustain the journal anyway, and could not afford to print the title anymore. The choice was therefore made to make it available only in an electronic format in a gold open access environment where it is not currently being sustained by its active research community, but instead by the editor and her institution, who take on most of the publishing responsibilities. *Litnet Akademies* is therefore available in a thriving open access environment due to the needs of the research community it exists in, whereas *Image & Text* is available in a gold open access environment due to financial and other limitations (which will be explored in more detail later in this section) and because it was the only choice available.

The two journal titles, *Image & Text* and *Litnet Akademies*, are both very dependent on their research community. *Litnet Akademies* was derived from an existing research community through the activities of the *Litnet* website, where the journal becomes the academic voice of its following. *Image & Text*, in turn, finds itself somewhat removed from its community in that the journal does not offer the same amount of interaction as that of *Litnet Akademies*. *Image & Text* is not evolving and growing with the

research and communication needs of its community whereas *Litnet Akademies* had humble beginnings and is including more and more subject fields within its offering.

The motivation for *ASSAf*'s involvement in open access scholarly publishing in South Africa is a mandated one. This initiative is funded and mandated by government. The body therefore has an extremely important and influential role within the whole of the scholarly community, but still has very limited decision-making power due to the governmental influence. The choice of the SciELO platform is an indication of this. The SciELO platform is still undergoing various changes and is not an extremely powerful research tool when compared to other open access platforms. It was however the choice made on their behalf for hosting these journals and they now need to make do with a less powerful, less impressive platform for a very important task.

The reputation of *Taylor & Francis* with regard to high quality scholarly publishing and publishing innovation cannot be ignored. The multi-national organisation is a well established, influential publisher that is listed on the International Association of Scientific, Technical and Medical Publishers (STM) list, and publishes various high profile titles.*Taylor & Francis*'s involvement in scholarly publishing in South Africa is fairly recent. The regional office was opened in 2007 and they have been involved in open access scholarly publishing only since 2010. This multi-national publisher however displays a clear understanding of the fact that the South African scholarly community has unique needs when it comes to open access publishing. Their choice to enter co-publishing agreements with publishers who are influential in the South African market is a clear indication of this understanding. These include *Unisa Press* and *NISC* and also *Medpharm* (which will be discussed later in this chapter). Their motivation to become involved in open access business models was therefore a carefully considered one and also a business concern that was specifically investigated for the South African research community, answering the need of this community. This multi-national and influential publisher therefore offers many years of publishing experience, aiming to support and grow the South African research output.

The general background and publishing information set the foundation for the rest of the discussions, allowing the researcher to ask more focused questions. The following sections will explore specific factors concerned with sustainability in more detail.

4.3.2 Publishing process

The researcher used the simplified scholarly publishing process (Figure 3.3) as an example, allowing respondents to indicate their publishing workflow as well as their involvement in the process. Throughout this study the importance of the quality of the research has been highlighted. This section of the interview therefore explored to what extent the respondents are involved in the quality output of the research in an open access scholarly publishing environment.

All the journals investigated conform to the whole publishing process in that articles are peer reviewed and that language and content editing are performed. *Image & Text* is still designed to communicate to the visually focused audience it addresses. The journal is therefore designed as if it will be printed, thus not embracing the technological opportunities offered by digital publishing to its full potential. *Litnet Akademies* requires papers to be submitted in the format that they will be published in. They therefore do not perform an in-depth production function. They do however make the articles available in a bigger research context by incorporating them with the other related content on the *Litnet* website.

The overall focus of *Medpharm*'s titles is very academic, whereas *EE Publishers* addresses a less formal reader, even though their content is still very specialised and technical. *Medpharm* is therefore very specific about what types of articles need to undergo peer review and special content editing, whereas *EE Publishers* approaches these quality influences on a case by case basis, or at the discretion of the journal editors.

Tools incorporated in the workflow of the publishing model include Open Journal Systems and ScholarOne. All of the journals and publishers however still rely very heavily on email submissions, author communications and a very labour-intensive workflow which is not always tracked within a system. *Litnet Akademies* makes use of a submission and workflow platform that they developed for their own specific needs

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(with the incorporation of other content in mind) and *Image & Text* makes use of a spreadsheet updated by the editor.

Role players offering services within the publishing workflow

SciELO through *ASSAf* indicated that they form part of the distribution function. They are therefore not involved with the production of the journals that they host. Even the production of their own journal, *South African Journal of Science*, is done by African Sun Media. *ASSAf* does however have a very important voice in the scholarly publishing community and is very influential with regard to the academic reward system and their continued involvement with the Department of Higher Education and Training as well as research bodies such as the National Research Foundation. They also coordinate bodies such as the National Scholarly Editor's Forum, which makes their important role and influence undeniable.

In their evaluation of journals they produce reports with regard to quality, aiming to promote the scholarly output of these journals. The evaluation is done according to broad subject categories, for example grouping all the law journals together. When looking at individual titles within these subject collections, it is evident that these titles address specific audiences, readers and contributors and should perhaps not fall within the same category or be evaluated under the same criteria. Suggestions have for example been made by *ASSAf* for specific titles to be combined in an attempt to combine the publishing efforts of these societies, but the focus and interest of the journals are so focused that by broadening the subject matter the identity of the journal as well as the research community it serves, will be lost or diluted. While this may be of value for some journals, allowing for more submissions, other journals may not benefit from it at all.

The evaluation reports produced go to the journal editors, who are not always the individuals responsible for the actual quality of the journal (from a publishing perspective). Even events such as the annual meeting of the National Scholarly Editors' Forum, excludes the publishers of some of these journals, which creates a gap in the communication cycle and does not contribute to the advancement and

discussion of the whole research community. SciELO through *ASSAf* would also urge editors to make their journals available within a gold open access model, thus not allowing them to rely on a subscription model anymore. When queried about this, Ms Veldsman indicated that they never urge societies to discontinue their print subscription income, but that they are no longer able to charge subscriptions for electronic access. Some of these journals rely on this income as their only source of funding and will therefore discontinue publication if they are not able to generate an income, consequently losing their accreditation and most possibly ceasing to exist. The disconnect here is that neither SciELO or *ASSAf* can fulfill a publishing function and therefore cannot support these small society publishers or single titles.

Taylor & Francis South Africa bring with them the backing of a multi-national organisation which is highly regarded in the scholarly research community. Co-publishing agreements with this publisher therefore allow the journals and their publishers access to advanced, continually developed platforms and resources that these titles would not have had access to on their own. It is however also true that due to these automated processes it is a lengthy process to implement the style guides for the specific titles (for example the very specific style guides required by *Medpharm*'s medical titles). New co-publishing agreements also require the publisher to hand over some of the processes that they were very involved with to a service provider that is not that familiar with the journal.

On the other hand, many societies still see big multi-national publishers in a negative light. The journal *Image & Text*, for example, was approached by *Taylor & Francis* South Africa, but the editor declined the opportunity for any discussions, because of the fear that the identity of the journal would be lost within the catalogue of such a big publisher. This journal also has very specific design needs which link directly to the identity of *Image & Text* that would have fallen away in *Taylor & Francis*'s automated production processes.

As indicated in the previous section *Taylor & Francis* recognises that the South African scholarly publishing environment has unique attributes and therefore opted to partner with publishers who have influence and expertise within this specific publishing environment. These include *NISC* as well as Unisa Press. Such partnerships promote

the notion that the titles will still remain South African and may reassure societies and editors that the interest of the South African research community is still what is of importance.

It is within these partnerships that the researcher identified interesting collaborations where African Sun Media, for example, which is in essence a university press, offer their production services to *ASSAf*'s *South African Journal of Science* (as one example) and where *NISC* became a South African representative for *Taylor & Francis*, thus offering their production experience to *Medpharm*. This three-way collaboration will be explored later in this chapter.

4.3.3 Audience and client segment

When conducting the interviews the researcher indicated that the audience and client segment is much more than just the reader. For the purposes of sustainability evaluation the audience and client segment is anyone who derives value from the publication. Respondents were therefore asked to identify the individuals or groups who derive value from their publication. These were discussed in detail in the separate reports. The researcher observed that all the respondents did identify some or all of the client segments that derive value from the publication or publishing service. What is however of concern is that some of the publishers or initiatives are not aware of all the client segments and some even address too many.

EE Publishers, for example, offers various additional services that have become somewhat removed from their publishing focus. It is not clear if this hinders the sustainability of the journal titles that they produce. On the other hand these activities do promote unity within the research communities, such as allowing specific interest groups to attend the same event.

Medpharm Publishing indicated that in an open access environment the audience focus changes. In this new workflow the author becomes the client and the publisher is now a service provider.

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ASSAf addresses the editors in their aim to enhance the research output of journals in South Africa. They however do not include the publishers in these communications or discussions and this may cause the publishing workflow to be disrupted or even discontinued for some journals. They also do not consider the value proposition of the individual titles when conducting their evaluation, thus creating broad categories and disregarding the unique attributes of specific titles. *ASSAf* is extremely influential and important in the scholarly publishing community of South Africa, but they do not have an in-depth knowledge of the actual publishing process of a journal. They are also mandated and therefore do not necessarily have a say in the platforms and resources they promote.

4.3.4 Value proposition

As indicated in the previous section the publishers or initiatives address a specific audience and client segment. This section investigated what these publishers or initiatives offer their identified audience or client segment to answer their specific needs. Factors of interest in this section included if any of the services provided by the publisher were unique and innovative.

Litnet Akademies strives to cater to their existing research community. Simply the establishment of the journal is evidence of that. This journal is continually growing and evolving to include more subject areas. The journal is also embracing more of the technological opportunities offered by the digital environment. Related content is integrated with content on *Litnet*.

Image & Text also address a specialised research community. The identity of the journal is very important to this community and due to the subject matter the audience is very visually focused. As indicated previously, the journal is designed for print but only available in an electronic environment. Consequently none of the technological opportunities of a digital environment are used. The journal is dependent on the editor to be sustained, and no future plans are in place for the continuation of the title once the editor is no longer involved. Opportunities for co-publishing have been offered but declined.

Medpharm and *Litnet* offer financial incentives for authors whose research papers are accepted. *Litnet Akademies* has reduced the amount, with the launch of their independent website, thus indicating that the higher amount was to encourage authors to submit their papers. Both these examples indicate the important role that influential researchers play in focused research environments in encouraging other researchers to also want to publish their work with these journals.

It is important to consider the change of audience when moving from a subscription model to an open access model. In most cases this entails an additional audience, because some of these journals will remain in print format and still attract advertising revenue (as one example). *Image & Text* may not be able to adopt an APC model (for example) as a means to sustain itself, due to the fact that they have been available in a gold open access model for so long without requiring any form of payment from the authors. A research community may be more open to such a change if they have been paying page fees.

It is important for these publishers and initiatives to be aware of the needs of their audience and client segments in order to make sure that they are offering the correct and optimal services. What is however also true is that the publisher may not be able to offer everything required by the audience or client segment. Publishers should be aware of these needs and evaluate if it will contribute to the sustainability of their initiative to outsource such functions. That is why it is very important for role players to know exactly what the associated costs are of their publishing activities and also what the scholarly publishing process entails.

This awareness and knowledge links to the activities of the publisher.

4.3.5 Core activities and resources of the publishing initiative

After the client segment and audiences were defined, together with the needs associated with these groups, the researcher investigated how the services provided by the publisher or initiative are supported. Such support may include something

intangible like the reputation of a journal. The researcher asked about the staff complement of the organisation and which functions are performed in-house and which are outsourced.

It is with this part of the investigation that it became clear that in order for a scholarly publishing model to be sustainable (in an open or subscription environment) specific elements need to be in place, thus encouraging the continuation of the scholarly publishing workflow. These include an established publishing workflow with specific individuals fulfilling specific functions; a steady stream of article submissions that are of sufficiently high quality; a well managed and trusted peer review process and a clear understanding of the publishing processes and the financial implications associated with each step.

Image & Text for example is still publishing due to the reputation of the journal and the niche market that it addresses. If the editor is however no longer there, there is no way for the journal to continue its cycle. The reputation and following of *Litnet* allowed for *Litnet Akademies* to obtain accreditation before its first publication.

An important concern for open access scholarly publishing is the availability of relevant research in a timely manner. Digital publishing allows for articles to be published as they are available which is an important motivator for academic discourse. This however requires a mind shift in the workflow of the traditional scholarly publishing process, where articles were kept back until the issue of the journal was published. Not all these journals have adopted such a workflow yet.

4.3.6 Distribution channels

This section explored all the routes taken by the publication to reach the intended audience or client segment.

Some publishers offer their skills in this regard to others. *NISC* for example distributes the titles of Unisa Press and African Sun Media makes use of a third party to distribute their titles. It is important to note that print and digital both remain important.

In a digital environment distribution becomes even more important, especially when these channels should be free of charge for the reader. Usage statistics now become important. The processes should also ensure that the articles are available in the formats required by the research community such as PDF or EPUB and that they are produced in such a way that they can easily be indexed and retrieved. The version of record is also very important, thus ensuring readers that the version they access is the correct one. Elements such as a DOI can aid in this process, enabling users to link to the same version every time.

SciELO boasts that this is a factor of importance for them as well, but *ASSAf* admitted that the platform does not offer valuable usage statistics. This is something that is being reviewed and developments are being made, with an intended roll out date in 2015. In turn, the *Taylor & Francis* platforms offer various usage statistics depending on the purposes they are needed for. The publisher has a whole department logging, identifying and reporting on the usage of research articles published on their platform.

The furthest possible dissemination of research has always been the main motivator for open access publishing. The notion of regional importance of research can however not be denied. Important research may not be relevant to a global research community. Distribution of this research therefore needs to make sure that the correct reader is reached for the research cycle of scholarly publishing to continue.

4.3.7 Income streams

The actual financial income to support these open access initiatives was discussed for every case study. An overall concern is however that the publishers or initiatives are not all aware of what it actually costs to publish high-quality research, simply because all the factors are not considered. This may be because the publishing initiative is funded and these costs are never discussed (as is the case for *Image & Text*) or because the actual costs are absorbed by other income from other publishing activities (as is the case for *EE Publishers*).

ASSAf is funded by the South African government. As indicated Ms Veldsman is not concerned that this funding will disappear, but it is a reality to consider seeing as it is their only income stream.

Commercial publishers show greater awareness and better management of costs and income and also have better diversity of income sources.

The co-publishing case study highlighted that the continuous evaluation of the income streams is important. In the case of *Medpharm* they could no longer sustain their publications on advertising income due to budget cuts as well as regulations hindering pharmaceutical companies to advertise.

4.3.8 Overall challenges with regard to the publishing model

The exploration and evaluation of every role player indicated that every publishing initiative experiences their own challenges specific to their business model. These were discussed on a case by case basis for every respondent. Some of these challenges were however overarching and can therefore be assigned to the whole South African scholarly publishing community. These include the following:

- Difficulty in changing the business model from one that was traditionally print subscription-based to an open access business model.
- Difficulty in identifying which business model would work to sustain the journal.
- Maintaining the high quality of the journal while still making sure that it publishes regularly.
- Motivating authors to submit to your title instead of an "international title".
- The misconception that "international titles" carry more prestige. Even some academic institutions promote this notion towards their faculty members, encouraging them to publish with titles not published in South Africa.
- Identifying roles that the publisher should outsource.
- Not knowing, or not being aware of, the actual costs associated with the publication because the initiative is funded or forms part of an academic department (such as *Image & Text*).

- Societies or journal titles being unable to distance themselves from a subscription model as this is regarded as hindering South African research advancement – which is in fact not the case.
- The widespread notion that open access scholarly publishing should replace the subscription publishing model, hindering opportunities where these two models can enhance one another.
- A general fear of learning from one another within the scholarly community was picked up by the researcher. The reasons for this are not entirely evident, but there is definitely some form of mistrust within the scholarly research and publishing communities.

4.4 Conclusion

This chapter discussed various South African initiatives involved in open access scholarly publishing. The researcher identified various representative initiatives and the motivation for their inclusion was also discussed in this chapter. The discussion was structured around the sustainability factors identified in Chapter 3. The researcher made use of in-depth interviews as well as a desk study to explore all the factors listed for every initiative.

The researcher also investigated the involvement of international scholarly publishers in the South African scholarly publishing environment.

The exploration showed that quality control measures such as peer review and language editing remain important even in the open access environment. The important function of the publisher can therefore not be ignored. Another important consideration is that the South African scholarly publishing environment has unique attributes and therefore specific publishing needs when it comes to open access scholarly publishing.

The study also indicated that even though continued research is very important for the scholarly publishing community, usage statistics and impact factors are not elements

that are currently being tracked accurately and in some cases not at all. The South African scholarly publishing environment is still very much driven by traditional print subscriptions and switching over to an open access option takes some time.

The reader as possible future researcher was also identified as part of the client segment by all the publishers. This is an important consideration due to the fact that the needs of the reader as researcher become very important considerations in the open access scholarly publishing environment. The researcher therefore found it encouraging that the publishers are aware of their readership and the needs of researchers who wish to submit their work and also the motivation behind scholarly publishing as a whole.

The skills of experienced publishers remain important regardless of the chosen business model. A few South African publishers are experimenting with combining their skill sets thus functioning as a community, each contributing their expertise to promote South African research. This is evident is the example given with regard to collaboration between three of the role players in the initial study.

The next chapter (Chapter 5) will make suggestions towards a sustainable scholarly publishing model by addressing the findings made in Chapters 3 and 4 and also mention elements that may be considered for further research.

Chapter 5: Summary and conclusion

5.1 Introduction

In the previous chapter (Chapter 4) the researcher discussed case studies done on a representative sample of role players in the South African scholarly publishing environment by combining and utilising tools developed during the investigation of the international open access scholarly publishing environment (Chapter 3).

Chapter 5 is a concluding analysis of findings made in both Chapters 3 and 4. This analysis is necessary due to the fact that Chapter 3 allowed the researcher to develop various tools to structure the investigation in Chapter 4. Chapter 5 will therefore analyse these findings and make suggestions towards a sustainable open access scholarly publishing model in the South African context.

These suggestions will be made by means of summarising the findings made in the international investigation (Chapter 3) and indicating how they were implemented in the investigation of the South African role players (Chapter 4). Findings made in the South African investigation will be analysed in accordance with factors contributing to sustainability thus allowing the researcher to make suggestions towards a sustainable open access scholarly publishing model in the South African context.

This chapter will also answer each of the research questions set at the beginning of this study.

5.2 Findings according to the research objectives

This section is structured according to the research objectives that the researcher set to achieve the main research objective, namely a sustainable scholarly publishing model for open access scholarly publishing in the South African context.

5.2.1 What does the traditional scholarly publishing model look like in the international context?

The researcher discussed the traditional scholarly publishing model within the international context in Chapter 3. This model was explored in two environments, namely, traditional print subscription scholarly publishing and traditional subscription publishing in a digital environment.

The traditional print subscription model was defined in section 3.2.1 and a conceptual model of traditional scholarly publishing was illustrated in Figure 3.1 (as adapted from Kennan and Kautz, 2007). The associated role players were also indicated.

When looking at the motivation behind scholarly publishing with specific reference to research publishing in academic journals, the researcher found that it is necessary to publish research findings in a high quality journal in order for the research cycle to be completed. New research will stem from existing research, that will ensure that the cycle continues (i.e. continued research) (also see Figure 3.3). The quality of the publication is of high importance because it amplifies approval of the associated research findings, thus affirming that it can be used for further study.

To achieve high-quality research output, the scholarly publishing cycle needs to fulfil the following functions:

- Peer review
- A production process (including language editing, style editing, typesetting and design)
- Printing and/or distribution
- Credit and citation
- Archiving, which will ensure continuous access to the version of record

The literature review in Chapter 3 indicated that the fulfilment of these functions is however hindered by elements such as the serials crisis, the high cost associated with publishing a journal, a slow turn-around time that is associated with the traditional print workflow and the concept of scarcity of content.

When the researcher moved on to the discussion of the digital publishing environment it became clear that various information technology tools enhance the traditional print model. The possibilities offered by the digital environment are summarised in Table 5.1 below.

Table 5.1 Enhancements to scholarly publishing workflow in the digital environment

Publishing cycle function	Enhancements in digital environment
Peer review	- Streamlined management system - Digital submissions - Tracking tools - Review of the 'masses'
Production process (including style editing, language editing, typesetting and design)	- Version control - Faster workflow - Metadata tagging for - Automated indexing - Harvesting of third party data vendors - Search engine retrieval - Repositories
Distribution, credit and citation	- Various subscription options for institutions and individual subscribers - Available to a wider audience - Can be searched for, retrieved and accessed more efficiently - Easier for researcher to provide evidence of publication - Version control through DOIs and other technology - Credit and citation can be tracked - Electronic editions available to a wider audience due to easier access
Archiving for continuous access	- Digital editions can more easily be archived - Efficient retrieval - Perpetual access is now possible to version of record files such as PDFs

With this enhanced environment some of the challenges associated with the traditional print subscription model were to some extent eliminated. The possibility of wider access and a more streamlined publishing process, however, changed the expectation of the users. Consequently the possibility of open access scholarly publishing became evident.

The researcher found that open access scholarly publishing models are based on the traditional model's workflow.

5.2.2 What are the open access scholarly publishing models used in the international context with regard to motivation for use, role players, specific examples and challenges encountered?

The researcher investigated the various open access scholarly publishing models by conducting an in-depth literature study. This exploration was not confined to a specific country and is therefore seen as an international investigation.

The open access scholarly publishing environment was explored in the following broad categories:

- Gold open access
- Fully green open access
- Green open access supplementing subscription scholarly publishing

Gold open access publishing models

Research published following a gold open access model is available free of charge to the reader at the time of publication (Crow, 2012; Max Planck Society, 2010; Swan, 2012). The researcher identified the following approaches following this model:

- Community publishing: Research articles and journals produced within a specialised research community, where scholars and researchers volunteer

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their time and expertise to perform the publishing functions such as peer review and language editing, with the intention to keep the costs as low as possible (Open Oasis, 2011).

- Author pays publishing: The author becomes a paying customer and carries the costs associated with publishing a research article (Cockerill, 2006; Crow, 2007; Crow, 2012; Halliday, 2001; Open Oasis, 2011; Peters, 2007; Reisz, 2007; Terry & Kiley, 2006).

- Advertiser pays publishing: Publishers sell advertising space in their journals or on their websites to sponsor the costs of publishing a high quality article (Crow, 2009; Morris et al., 2013; Open Oasis, 2011; Reisz, 2009).

- Institutional subsidy: Relying on the subsidy of the associated or sponsoring institution for publishing activities for example the support of a university for their university press (McGuigan & Russel, 2008; Open Oasis, 2011; Van Noorden, 2013).

- Institutional membership: Institutions pay a lump sum in advance on an annual basis to a publisher (such as BioMed Central and Hindawi Publishing Corporation) for articles that will be published by their faculty members affiliated with the institution (Bailey, 2006; Open Oasis, 2011). This lump sum should in theory be less than the sum of what the institution would have paid towards APCs or submission fees.

Motivation for implementation of gold open access:
The scholarly publishing process aims towards a high-quality publication to encourage continued research. In an open access environment the distribution methods are dramatically enhanced. Articles are also placed in a bigger research context due to the fact that information can now be linked together and harvested by other data vendors. The electronic environment allows for endless possibilities.

Authors, editors and publishers have various reasons to opt for a gold open access scholarly publishing model. Benefits identified in the literature study (as applicable to the international context) were also confirmed through the case studies of the South African examples.

The main motivation for publishing in an open access scholarly publishing environment is to communicate with peers. Research can be made available online as soon as it has gone through the publishing process, without having to wait for a journal issue to be ready.

It is clear that the quality of a journal remains important in the open access environment. It may even be more important seeing as role players such as researchers and publishers have a reputation to uphold. Researchers therefore want to communicate with their peers through a high-quality publication.

The publishing industry therefore now becomes a service industry offering various services associated with the publishing process to other role players in the chain (for example *Medpharm Publications* receiving project management services from *NISC* through their co-publishing agreement with *Taylor & Francis*).

Due to this change in the industry and a reconsideration of the expertise and functions within the scholarly publishing environment, all publishers now need to improve their services and focus on their strengths. Some of the literature indicates that costs such as APCs should therefore be linked to the value proposition of the publisher. This is however not entirely the case as some publishers ask enormous APCs and offer exactly the same service as publishers who charge a portion of that.

In the open access scholarly publishing environment, relationships become very important. These relationships are between the societies and their members and between the publishers and the societies for which they publish. It is a complicated environment with many role players all with the same vision – publication of high-quality research output communicated to the applicable research community with the goal of continued research. *Medpharm* for example chose to partner with an international publisher in order to enhance the reach of their journal and also to encourage a wider readership, which will contribute to more submissions for the journals. In turn the journals which have been featuring very fewinternational authors may become of interest to other research communities, and not only be limited to a South African audience and submissions.

Role players associated with gold open access:

To ensure high quality research output in the gold open access journal environment, various role players need to fulfill their functions. These role players were highlighted in the scholarly publishing process as indicated by the researcher. It is important to consider that these role players are the same ones as in the traditional subscription publishing model, but that their roles and functions may be different in an open access environment. The most obvious of these being that the scholarly researcher as author now becomes a paying customer (when APCs are applicable).

Role players indentified in the gold open access scholarly publishing environment include the research community, authors, publishers, funders and the affiliated institutions of the researchers as well as the publications.

All of these role players have important functions within the scholarly publishing process to ensure that scholarship is promoted through high quality research output.

Challenges of implementation of gold open access:

The gold open access model allows for various business models to be implemented to make it sustainable. It is however not without challenges. A change of business model is always difficult. To, for example, suddenly introduce APCs where it was previously free for researchers to publish should be handled delicately by both the publisher as well as the academic society.

A thorough understanding of exactly what costs are involved to publish a research article of high quality is important in order to make sure that when changing the business model, income streams are adequate for the publication to be sustainable.

There are also some societies and also researchers who have a negative association of APCs indicating that there might be a belief that if an APC is paid publishers will automatically publish that article without considering the quality of the paper. The quality of the journal should therefore remain intact and publishing processes need to be transparent making this regard for high quality evident to authors. Predatory publishing creates a bad reputation for other publishers who follow and adhere to all the quality procedures. All publishers should guard against being perceived in a

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negative light with regard to their business practices (Anderson, 2013c; Basken, 2009; Beall, 2012a; 2012b; 2014).

In cases where APCs are not charged, for example community publishing, the publishing process relies on the active participation of all parties concerned with the publication. If someone commits to a role and does not fulfill it the publication will not continue or not be of the desired quality.

Some journals are subsidised by the institution they are affiliated with. *Image & Text* is such an example. Consequently the editor does not really have an understanding of what it costs to publish the journal and if the editor should leave her position at the university, the journal may not continue publication at all. When academic institutions opt for an institutional membership with a specific publisher they are bound to publish research with that publisher. Some researchers are therefore in a sense forced to submit their research to journals which would not have been their first choice. Institutions are also in some cases paying more for the submissions to these publishers when compared to other high quality journals which are not affiliated with commercial publishers.

When choosing to make articles available in an open access environment there are various ways to host them online. This however also means that there are various versions available. It is important that open access articles have identifiers to indicate which is the version of record.

When considering implementing a gold open access publishing model it is important to consider that this may not actually contribute to the needs of the journal. Some small society publishers who publish for a niche market, for example, are served well by a subscription model; having their articles available online and harvested by third party data vendors and receiving payment for the full versions is a sustainable stream of income for some. When they are then encouraged by organisations such as *ASSAf* to make their titles available on SciELO and forcing them to compromise their subscription income, this may cause these journals to be discontinued. Organisations that are considered important and influential in the scholarly publishing environment should have an understanding of all the various business models within this

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environment and also encourage business models which do not conform to their desired approach. High-quality scholarship cannot be excluded from initiatives that are supposed to enhance scholarship simply because they follow a different business model; a business model which is needed for their sustainability.

By understanding that not all journals can afford or are served well by a gold open access environment, it may be valuable to consider green open access for the authors who wish to make their research available in an open access format.

Fully green open access scholarly publishing models

This model of open access scholarly publishing occurs when the post-press version of a scholarly article is archived in a institutional or subject repository (Crow, 2012; Houghton et al. & Oppenheim et al., 2009; Max Planck Society, 2010; Reisz, 2009; Suber, n.d.; Swan, 2012). Examples of publishing models conforming to this route are:

- Self-archiving: Authors submitting research papers to institutional or subject repositories (Bailey, 2006; JISC, 2010; Max Planck Society, 2010; Suber, n.d.).
- Overlay publishing: Relies on an existing structure (such as an institutional repository) and builds a publishing function layer on top of that. Authors submit draft versions of papers to this repository that subjects these papers to peer review and/or other publishing functions (such as language editing) (Brown, 2010; Casella & Calvi, 2010; Houghton et al. & Oppenheim et al., 2009).

Motivation for implementation of green open access:
The green open access environment allows authors who wish to make their content available free of charge to their peers to do so by submitting either a published article to an institutional or subject repository or by submitting an unpublished article to a repository that offers quality enhancements through overlay publishing activities.

Various academic institutions encourage their faculty to submit to these repositories by mandating it. The repositories most often form part of the academic library of the institution. Depending on the nature of the copyright of published articles, versions can either be pre-press – in other words the last version the author has available before

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the publisher made corrective changes and quality enhancements – or post-press, where the publisher allows the use of the version that went to print.

Researchers would also submit their unpublished work to repositories that offer overlay publishing functions to enhance the quality of the paper. These repositories open up the peer review process to anyone and in some cases offer language editing as well. In some cases these repositories are the only online presence for a journal (Brown, 2010).

Depending on the search and indexing functionality of a particular repository articles are placed in a bigger research context.

The researcher's investigation highlighted the fact that for a research article to be cited and reused it is important to have a version of high quality that is trustworthy.

Role players associated with green open access:
Role players involved in green open access scholarly publishing are the authors and the repository managers (which in many cases fall within the ranks of the particular institution's library). Indirectly the publishers of the journals and the journal editors are also involved in this process seeing as the quality control of the versions available in these repositories is a function fulfilled by them before the articles are available here.

Challenges of implementation of green open access:
These repositories have various challenges associated with their workflow. Most prominent is the issue of version control (Brown, 2010) and also the fact that the authors do not always have the pre-press version of their article (Olivier, 2012). Although submission to these repositories is mandated by various institutions many authors are not always aware of this and some do not know what the process is to get the article on the repository (Swan, 2006a,b). Many researchers do not feel that it is necessary because the institutions they are affiliated with have access to all the research material they require (Swan, 2006a,b).

While the institutional or subject repositories are probably the most obvious examples, some journals also publish in this manner. *Virtual Journals in Science and Technology*

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is a series which combines the best articles over a number of titles (Brown, 2010; Van der Sompel, 2011). *Lund Virtual Medical Journal* is another example (Casella & Calvi, 2010).

In the South African context green open access is widely promoted within academic circles due to many journals that are not publishing in the open access environment. Academic authors in many fields are also encouraged to submit their articles to international journals and the pre-print version will then be made available in the institutional repository.

Green open access supplementing subscription access publishing models

It is a common practice for publishers to allow for the articles they publish to be made available through repositories and websites but still rely on a subscription model for either the print edition or the online access (Swan, 2012). These type of models include:

- Hybrid (mixed model) publishing: The publisher relies on subscription income or payment for various services to fund open access scholarly publishing (Gardner, 2013; Max Planck Society, 2010; Morris et al., 2013; Reisz, 2009; Stutton in Reisz, 2009).
- Subscription publishing that offers an open access choice: Authors have the option to publish their article as a gold open access article in a subscription-based journal at a fee that is much higher than APCs (Bailey, 2009; Reisz, 2009).

Motivation for implementation of mixed model publishing:
Scholarly publishers are realising that their original business models may not be contributing to the growth of the journals they publish or the societies they serve. *Medpharm* wanted to enhance their original research article reach and not compromise the quality and thus opted to co-publish with *Taylor & Francis*. *EE Publishers* offer various additional services to their existing publishing activities allowing their advertiser pays model to be enhanced and subsidised should the income

not be enough. Publishers therefore need to evaluate their services and customer satisfaction on a regular basis.

Many commercial publishers offer an open access choice to authors who wish to make their articles available in an open access format even if the journal in which they are published is subscription-based. This choice is available because these international publishers want to give their authors this option and not turn them away. Authors will opt for this option because they trust the value proposition of the journal and the associated publisher.

Role players associated with mixed model publishing:
Role players involved in this form of open access publishing are the same as for gold open access publishing because the publishing process is identical.

Challenges associated with mixed model publishing:
When publishers consider expanding the business models there are various challenges associated. Publishers need to be aware of the client base and who they wish to address with these additional services and who they can afford to exclude from their offering. Publishers also need to be aware of the costs associated with publishing high-quality research and need to approach the decision on a business model with this in mind.

When commercial publishers offer an open access choice the associated cost is in most cases very high. Altough the option of waivers is available not all authors are eligible for this. In many cases these authors may find it more important to publish in an open access journal than publish with the associated publisher and consequently submit their paper elsewhere.

Specific examples of implementation of mixed model publishing:
This study has explored various examples of publishers opting for a combination of business models to sustain their publishing activities. Most of the South African examples comformed to more than one business model.

Chapter 3 discussed the characteristics of each publishing model by referring to the motivation for use, associated role players, specific examples of implementation and challenges associated with each sub-model within the main grouping. The main points of interest will be discussed in the following section.

This overall investigation allowed the researcher to identify challenges that exist in open access scholarly publication in the broader sense. These include quality concerns, double dipping or predatory publishing, hesitation on behalf of the researcher as author and the notion that the true cost of publishing is not always reflected or acknowledged in an open access scholarly publishing approach. All these challenges were discussed in-depth in Chapter 3 (section 3.6).

By defining first the traditional scholarly publishing model and then exploring how open access is founded on this publishing model, the researcher established that the publishing workflow of scholarly publishing remains the same. Even the role players remain the same although their roles may become more or less involved depending on the environments. Some roles even change. Consequently the researcher developed a simplified scholarly publishing model (illustrated in Figure 3.3) which indicates the basic workflow together with the associated role players.

The motivation of the subscription as well as the open access scholarly publishing environments is the same – the continuation of research. To achieve this, the research output has to be of a high quality. The researcher therefore continued the exploration by identifying which factors in the scholarly publishing environment contribute to this continuation. These were discussed as sustainability factors in the literature study and discussed in Section 3.9 of Chapter 3.

5.2.3 How can sustainability be defined in relation to open access scholarly publishing?

The researcher defined sustainability as factors that contribute to the continuation of the research cycle (as depicted in the simplified scholarly publishing model). Such a simple definition is possible because the researcher considered a publishing model the same as a business model as indicated in section 1.2.3. This logic was then also applied in the creation of the simplified scholarly publishing model (Figure 3.3) as presented by the researcher, in that both of these are cycles.

When Crow (2009) discussed the principle behind the sustainability of scholarly publishing, he made reference to the role player, queried the payment method and asked what the role player was paying for. For example, the reader of the article will "pay" with his or her attention for the applicable and relevant information. Another example is the author paying with author fees (APCs) for the publication of his or her research.

When then considering all the role players Crow's explanation of sustainability can be applied as illustrated in Table 5.2.

Table 5.2 Conceptualisation of Crow's definition of sustainability in open access scholarly publishing

Role player (Client segment / audience)	Payment method (contribution to growth and continuation of the title)	Paying for (what is the value proposition?)
Reader or future researcher	Attention	Applicable information (towards future research)
Author / researcher	APCs or page fees	Publication of research
Funder	Financial contribution	Attention of target audience
Publisher / editor	Financial input and also skills and infrastructure	Journal reputation towards growth of journal client segment satisfaction
Reviewer Language editor	Skills contribution for payment	Recognition Continued research Quality of publication Financial gain
Librarian (including citation indexer etc.)	Hosting; Tagging/Indexing; Archiving	Access and retrievability of research for their target market within a pool of information
Third party data vendor	Hosting Indexing for increased exposure Archiving and preservation infrastructure	Growth of pool of information Increased exposure
Host	Providing some of or all of the publishing functions Infrastructure	Continued research Growth of pool of information Reputation

Table 5.2 indicates that the role players associated with the scholarly publishing process are all part of the client segment or audience. The publisher or service provider will therefore make a value proposition to the targeted audience and the audience in turn will contribute to the publishing process provided that they feel this contribution is worthy of the value offered. If the publishing model and the service offered answers the need of the client segment the model can be sustained, provided that the client segment continues their contribution and the value proposition remains. This concept is illustrated in Table 5.3.

Table 5.3 The contribution method defining sustainability in open access scholarly publishing

Role players / Client segment and audience	Payment / contribution method	Paying for? (Motivation for use)	Value proposition offered	Is the model sustainable?
The publisher or initiative will make a value proposition to the client audience (who will all be role players)	What does the role player (as client) give that contributes to the growth of the publication or initiative?	What does the client need from the model? What is the motivation for use and contribution /payment?	Can the model answer the need of the client?	Can the model assist the publication to grow? Does the publishing cycle continue to flow?

When addressing sustainability in open access publishing one needs to establish if the initiative will continue to grow and complete the simplified publishing model with all the contributions.

When evaluating sustainability or exploring other business models as alternative options to enhance or replace the existing business model, publishers therefore need to consider the role players, client segment and what these role players will give that contributes to the growth and continuation of the publication. Role players (including the client segment) will only contribute if they need something offered by the publishing model and associated services. The publisher therefore needs to understand what the motivation for use would be. The publisher needs to make a value proposition that will answer what the various client segments need. If the requirements and the service offered measure up, the model can in principle be sustainable.

5.2.4 What contributing factors can be identified for sustainability in open access scholarly publishing?

In the literature review (in Chapter 3) the researcher identified the following aspects to be investigated with regard to the sustainability of a scholarly publishing venture.
- Audience or client segment – everyone that derives value from the publication.
- Value proposition – what does the publisher offer to answer the needs of the audience or client segment?
- Core activities and resources – activities and resources that produce the journal and support the funding model should be aligned with the value proposition.

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- Distribution channels – how does the research content / journal reach the intended audience?
- Income streams – how is income generated?

<div align="right">(Crow, 2009)</div>

The exploration of each of these factors was of high importance to this study because it considered all the different aspects that make up the whole of the publishing workflow and context as applicable to every respondent.

In the investigation of the international open access scholarly publishing context, the researcher discussed how each of the above mentioned factors can be applied to this particular research study (section 3.10.9). These factors were then used to structure the interview and consequently various sections of the research report.

The first few research objectives were important questions concerned with the international scholarly publishing context, providing this research study with a foundation for the investigation of the South African open access scholarly publishing context.

5.2.5 Is the traditional scholarly publishing model as defined for the international scholarly publishing context applicable to the South African context?

The researcher combined the findings of the first four research objectives to create tools for the investigation of the South African scholarly publishing context. Due to the fact that the international investigation enabled the researcher to develop a simplified scholarly publishing model, the researcher concluded that the traditional scholarly publishing model, as defined for the international context, could also be applied to the South African scholarly publishing context. The South African scholarly publishing activities are also conducted in the same environments as discussed for the international context, namely traditional print subscription, electronic scholarly publishing and open access.

The role players as identified through the literature review are also applicable within the South African scholarly publishing ecosystem and the models that were defined and discussed in Chapter 3 illustrated the workflow of the traditional subscription model in South Africa as well. It is the scholarly publishing landscape that was different.

The researcher investigated the workflow of the publications included in the sample in accordance with the simplified scholarly publishing model and came to the conclusion that the process as well as the role players conform to this model.

It is important to realise that the traditional subscription model is one that is still serving many of the journals well in South Africa. Numerous journals still ask subscription fees even though their articles are available in an open access environment as well. They are dependent on their subscription fee (whether it be for the print copy or for online access) to sustain the journal. And if this model is serving their market well, there should not be a reason or motivation for it to be changed.

When reviewing the traditional scholarly publishing model it is evident that the workflow is focussed on the quality of research output. From the peer review process every step is included to make sure that the final version of the article is of such a nature that it will be valuable information to the particular research community, and also that it will be used for future research, thus ensuring that the research cycle continues.

It is therefore of concern to the researcher that organisations that are influential in the scholarly publishing environment such as *ASSAf* are advocating (via SciELO) gold open access to high quality journals that are still functioning very well in a subscription model. These journals may not be able to continue publication without the subscription income.

The investigation of the international context as well as the South African context indicated that publishers as well as journal editors are encouraged to make a choice: either open access or subscription models. The South African investigation however highlighted the fact that there is no single business model that will sustain any one

publication and that a combination of approaches is often needed. The case study of *Medpharm* found that advertising income, for example, worked well in the past but was not a viable option on its own for the publications anymore.

The traditional scholarly publishing model is the model on which the open access publishing workflow is founded. High quality of research output remains important regardless of the business approach and publishers should consider the outcome as their motivation when deciding on a business model.

5.2.6 Which publishers or publications are representative of the various publishing models for open access that can be used to contextualise the South African open access scholarly publishing environment?

After conducting the in-depth study of the international context, and the various approaches to open access scholarly publishing the researcher grouped the different business models together according to their characteristics. The researcher made use of these categories to identify examples within the South African scholarly publishing environment through purposive sampling. Table 2.1 indicates the specific publishers or publications that the researcher identified for inclusion for this study.

The researcher combined the indicated characteristics from the literature review together with the simplified scholarly publishing model to make sure that the sample included role players from each phase of the scholarly publishing workflow.

The research methodology allowed for a small sample because of the in-depth nature and open-ended structure of the case studies.
Consequently the researcher identified and investigated the business operations of the organisations indicated in Table 2.1. When identifying the original interviewees other examples were also included, but some declined to be part of the study.

The sample included single journal titles; *Image & Text* subsidised by the University of Pretoria and *Litnet Akademies* published within an active research community,

funded as a Section 21 company by various contributors. Both of these journals are accredited by the DHET.

The researcher also investigated commercial publishers who publish their journals in an open access environment. These were *Medpharm Publications* and *EE Publishers*. Both of these organisations follow an advertiser pays business model. Although working very well for *EE Publishers*, *Medpharm* needed alternative business models to not only enhance their publications but to sustain the journals.

The researcher also included *ASSAf* as part of the sample. Eventhough not a publisher, *ASSAf* is very influential within the scholarly publishing environment of South Africa, and the researcher wanted to investigate the workflow of processes associated with their scholarly publishing unit and the running of SciELO.

A case study of a co-publishing arrangement between various role players was also investigated. *Medpharm* approached *Taylor & Francis* as an international partner due to a desire to enhance their offering to the academic societies and authors. The publisher realised that for their journals to be sustainable they not only needed more than advertising income but also a more extensive reach than what they could achieve on their own. This agreement called for a turnaround of the existing publishing model.

The organisations included in the sample were representative of the scholarly publishing environment in the South African context and gave valuable insight into the processes involved in open access scholarly publishing in South Africa and also towards a sustainable open access scholarly publishing model that considers the various challenges associated with research output in this country.

5.2.7 To what extent are these initiatives sustainable according to the factors identified as contributory to the sustainability of open access scholarly publishing?

Positive as well as negative elements were identified for every category (as listed above) of the publishing workflow. These findings were discussed in-depth in Chapter 4. Factors contributing to this sustainability of open access scholarly publishing and

factors hindering the sustainability of open access scholarly publishing were discussed in section 4.3.

The researcher found that each business approach has its own attributes and challenges. An advertiser pays model works very well for *EE Publishers* but eventhough this exact model sustained *Medpharm* previously, it had stopped doing that and forced the publisher to re-evaluate their strenghts and their publishing offering. Whether this new publishing model is sustainable remains to be seen, but the researcher believes that the existing one would not have done so. The researcher also believes that the publisher considered all the factors contributing to sustainability with the goal of high quality research output that would answer the needs of the associated societies and authors.

Litnet Akademies is obviously growing, not only through more articles being published but also by branching into additional subject fields. The journal relies on the community of the *Litnet* website but has also gained prestige from other contributors (for example from Holland). This journal is being sustained by funding and will not be able to continue publication without this funding. When looking at the nature of the agencies who fund this website and also the journal the researcher believes that this funding will continue for some time to come due to the fact that these organisations support Afrikaans culture. As is the case with any funding however, should it not be available anymore the journal will not be able to continue in the environment in which it currently exists (for example being able to pay for contributions *et cetera*). *Image & Text* is also indirectly being funded by the University of Pretoria (through subsidy). This journal is however not sustainable, because it relies on the presence of the current editor and design team who are all very loyal to the publication. Should these individuals no longer be affiliated with the university, the journal will most likely cease to publish.

The investigation indicated that some business models can sustain some initiatives and those same approaches cannot sustain others. Sustainability is very dependent on field of publication and the community in which this publication is used and supported. The question of sustainability is therefore dependent on various factors and whether publishers and publications recognise their strengths and weaknesses.

5.3 Towards a sustainable open access scholarly publishing model in the South African context

Section 5.2 summarised how the various research objectives were answered in this study and also indicated in which sections. This section will use these findings to make suggestions towards a publishing venture that its sustainable within the open access scholarly publishing field in the South African context.

The researcher will discuss these suggestions and conclusions according to the contribution method illustrated in Table 5.3 above.

This study indicated that the various publishing models all have their own characteristics and what works for the publisher and target audience of one journal is not necessarily what will answer the needs of another publisher and their target audience. In Table 5.3 the researcher indicated that a publishing model is in theory sustainable if the needs of the target audience are met in such a way that they are willing to contribute towards the publishing process. These various means of contribution are what ensures the continuous flow of the scholarly publishing process towards a high quality publication.

When addressing sustainability in scholarly publishing in an open access environment this needs to be discussed according to the various publishing models and broad open access environments namely gold open access, fully green open access and green open access supplementing subscription publishing.

5.3.1 Suggestions for sustainable open access scholarly publishing of gold open access articles

Models grouped as gold open access scholarly publishing models offer the associated target audience and role players relevant articles available at the time of publication in an open environment. This is possible due to the availability of a hosting platform and publishers and service providers that offer some or all of the publishing functions to ensure the availability of a high quality article. This research should be easily retrievable and accessible and easy to re-use and cite.

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Role players included in the target audience are the author, peers, publisher, content host, funder and affiliated institutions. These role players have different needs. The author, for example, wants his or her research available in a high quality format as soon as possible, in an environment where it will be read and used by the intended reader. The host of the content wants to make the article available as part of a pool of information which can be integrated that will promote continued research and contribute to his or her reputation and encourage usage by other publishers and researchers. The reader want to be able to access trustworthy information free of charge. Even the publisher sometimes needs services from other service providers to ensure that the offering to their target audience is of a high quality.

All of these examples indicate the specific needs of the various role players. The publisher therefore needs to be aware of these needs for the model to be sustainable. Should the publisher answer these various needs the role players will contribute towards the growth of the publication.

In a gold open access environment role players contribute subject-specific expertise such as reviewing of articles, editing services, design services, provision of a hosting and submission platform, submission of content, attention from the target audience for an advertisement, et cetera.

For a gold open access publishing model to be sustainable the publisher and publishing service provider therefore need to consider who their target audience is, and who contributes to the growth of their publication. The publisher needs to establish what the actual costs are for what they are publishing and ascertain exactly what they need to be able to offer the associated services to their target audience.

This is exactly what *Medpharm* did. The publisher realised that a change needed to be made for the journals to continue as well as for these journals to grow into international academic titles. In turn they realised that authors will only be willing to pay APCs if they receive a high quality service and that the societies will only be willing to offer a subsidy if they could be assured that there will be wider exposure of high quality articles through a prestigious publisher and platform.

Taylor & Francis in turn needed to offer *Medpharm* services that would aid them in their workflows and processes and offer them the opportunity to deal with the publishing functions of these journals, allowing for the publisher to address their attentions to other publishing opportunities.

The sustainability of a gold open access model therefore relies on the realisation from all role players of exactly what it is that they need to offer, and if they have the capacity and skills required for that offering.

The simplified scholarly publishing model indicates that all the role players are important within the publishing workflow to ensure high quality research output.

5.3.2 Suggestions for sustainability of green open access scholarly publishing initiatives in South Africa

Green open access scholarly publishing in South Africa is mainly focussed on self-archiving by researchers in institutional or subject repositories. Institutional repositories are funded by the institutions they are affiliated with. The staff are employed within the libraries of the academic institutions and the management and infrastructure also resides there.

These repositories aim for the use of post-print versions of articles from their faculty members, but this is not always allowed by the publishers.
The needs of the role players are somewhat skewed here, due to the fact that submission to these repositories is mostly mandated by the institutions who fund them. Consequently faculty and students do not always have a choice in the matter and it would not necessarily matter if the repository answers the needs of the authors.

Associated role players are the host (most often the libraries), the authors, funders (mostly the affiliated institution) and then also the copyright holder of the article. The reader is also a role player in this publishing model. In some cases third party data vendors are also involved.

These role players contribute to the continuation of these repositories in various ways. For example the submission of the original research on behalf of the authors, the provision of a hosting platform and the management thereof on behalf of the library. Copyright holders can contribute by granting permission for the submissions to be hosted. The reader makes use of the repository for his or her research needs and can then possibly also contribute a future article to the repository.

A repository therefore offers its research community exposure of the research (to the author) and retrievability of research for the reader. Some of these repositories are also harvested by third party data vendors, and that is only possible if the metadata and articles are available in such a format that they can easily be harvested and indexed elsewhere.

There is no standard practice for repositories in South Africa. Eventhough many academic institutions have them and support them, they all have their own policies and procedures. This raises various quality concerns due to the versions of articles available to the users. The researcher therefore does not believe that this form of green open access in its current state can be regarded as a sustainable form of open access as defined in this research study.

The researcher supports the notion of overlay publishing where the infrastructure of these repositories can be used as a means to subject new research papers to quality control procedures. The researcher could not find examples of this in the South African context. These repositories can then be sustained by the involvement of the various role players responsible for the quality control functions and also by a membership fee structure, where individuals or institutions pay an annual membership to be able to use such a repository. This is something that works very effectively in the international context with initiatives such as PeerJ. This will also encourage the development of standards and collaboration between different repositories to grant experts access in order to review or edit the papers. Consequently one single repository could be available between all the current single ones.

This form of green open access will encourage new inexperienced authors to submit their papers and have them subjected to peer review and constructive criticism; it could also aid inexperienced reviewers to gain experience and confidence within the academic field and will overall encourage academic discourse among experts in various subject fields. The researcher believes that this will be a valuable contribution towards the growth of scholarly research output and could then feed into a gold open access model instead of being an alternative. This option is also quite viable due to the fact that the infrastructures already exist and that in the interest of open access and successful high quality research output interested parties should be more than willing to participate.

5.3.3 Suggestions for sustainability in green open access supplementing subscription publishing in the South African scholarly context

Models that fall within this group of scholarly publishing models are simply defined as mixed models where for example, a subscription model supports an open access model.

The researcher discussed instances where publishers use the subscription income to fund open access activities and services and also subscription publishers who offer an open access choice.

The study indicates that when an open access choice is offered in a subscription journal this charge to the author is very high. Such options are offered by for example *Taylor & Francis*, and even when they adapt the charge to the South African currency it is still much more than that of APCs or submission charges. The researcher therefore believes that such a model will not contribute to the sustainability of open access scholarly publishing in the South African context.

The first example is however a very viable one for the South African market. Many smaller journals or single title publishers opt for subscription income for their print and/or online versions and then make the articles available in an open access model as well.

Publishers need to consider the various options and income streams available to them when they choose to make their title available in the open access environment.

Some publishers have different versions of the journal available online to what is available in the print edition. Some publishers charge access for the electronic version due to extra functionality available.

This study indicates clearly that an approach that works very well for one publisher may not work for another, due to factors such as the nature of the publication, the target audience, nature of the content, et cetera. When using the contribution model as illustrated above, publishers need to consider which sections of their target audience will be willing to contribute in which ways towards the journals' publishing cycle and growth. This will allow for a clear understanding of the various options that they can consider as business model.

5.4 Suggestions for further research

This study was focussed on suggesting a sustainable open access scholarly publishing model for the South African context. The study was undertaken within a much larger field of scholarly publishing and the researcher would therefore make suggestions for associated research studies.

The same type of qualitative study can be done within different circumstances as well. For instance a study that is focussed on the publishing scenario of another African country. The researcher believes that the attributes of various scholarly communities may vary. Another interesting investigation could be done on a different type of publication in the open access environment, such as literature that is not of a scholarly nature. The researcher believes that a study like this one can be enriched by including other members in the sample. This study documented various case studies on open access initiatives. Such a focussed case study can be done on a different publisher.

The study of the South African context indicated throughout that some form of standardisation and policy making with regard to open access is needed. A study could

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therefore be done by implementing a survey among academics and publishers as to who the leaders for such policy making should be, which could lead to valuable perceptions from the South African scholarly publishing community.

Elements that were not included in the scope of this study can also be investigated as further research. Such topics include a specific open access title that can be analysed and tracked with regard to usage statistics. Such a study would be more quantitative, and provide concrete date for decision-making, rather than attitudes and opinions. The researcher also struggled to find information on the copyright implications of open access scholarly publishing within South Africa. Such a study could be undertaken to focus on the understanding of the South African author as researcher.

This study discussed various income streams but did not include actual costs. A study could be done on the costing models of open access scholarly publishing.

5.5 Conclusion

Chapter 5 was a summary of the findings within each chapter and a conclusion, suggesting important steps that need to be taken towards a sustainable open access scholarly publishing model within the scholarly publishing environment of South Africa. The researcher discussed the findings made in Chapter 4 with regard to the South African open access scholarly publishing environment. This discussion was structured according to the factors contributing to sustainability. This structure was implemented to make sure that all elements were addressed in the investigation.

The researcher acknowledged that the simplified scholarly publishing model, as illustrated in Chapter 3, is a sustainable one, whether it is representative of a subscription-based or an open access scholarly publishing model. The researcher also highlighted the importance of the quality of the research output and therefore the important role that the scholarly publisher plays.

The researcher also identified that the South African scholarly publishing environment is not all clear on their roles within this environment because they find the shift from

the traditional print subscription publishing model to an open access one challenging. Role players are therefore in many cases still fulfilling their traditional roles and not embracing the new workflow and the enhancements it offers to the traditional workflow.

It was also indicated that publishing role players are not always aware of their expertise. Some of these initiatives still try to do everything instead of focussing on their new role and their new client segments. They are therefore missing out on various opportunities offered by an enhanced publishing environment.

The researcher concludes that there is a lack of collaboration within the South African scholarly publishing environment. In the identification of the various elements hindering sustainability some form of collaboration within the scholarly publishing community as a whole was the solution.

The researcher also acknowledges that an open access scholarly publishing model should instead be an enhancement to the traditional subscription publishing model and not one that replaces this model.

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Appendix A Interview schedule

Title of study	Towards sustainable open access scholarly publishing business models in the South African context
Motivation for interview	Contextualisation of the South African scholarly publishing environment
Interviewer	Ina du Toit
Interviewee	
Date and location	

Thank you for agreeing to partake in a discussion as explained in the cover letter. The aim of this discussion is to situate your publishing process in the wider context of scholarly publishing in the South African environment, with specific reference to open access publishing. Your publication or initiative was identified as representative of one of the key role players in the scholarly publishing environment. I am therefore here to learn from you.

I have split this conversation into sections. It will focus on various facets of your business workflow, that I identified from my literature study as "factors of sustainability". I would like this to be a conversation more than an interview, because your input will be a very important contribution to a clear understanding of the South African context.

1. General background and publishing information

This section will focus on the types of publications that you produce.

1.1 Tell me about your catalogue and publication offering.

1.1.1 For example, do you only publish journals? Or do you publish books and supplements as well?

1.1.2 Do you publish in a specific academic field or fields?

1.1.3 Do all these titles fall into an open access model (in other words that they are free to the reader)? Specify which model (i.e. green or gold)?

1.2 What was your initial motivation for making your content available in an open access environment?

2. The publishing process

With this section I am aiming to understand your publishing process and workflow. I have created a simplified publishing model that we can use as a foundation for discussion.

2.1 Walk me through the publication of one of your titles.

2.1.1 Does it conform to the presented simplified publishing model? Please use it as an example to discuss your workflow.

2.1.2 What part of the publishing process is the most challenging and why?

2.1.3 What part of the process is the most streamlined and why?

2.2 What quality control measures do you implement in the publishing process?

3. Audience and client segment identification

The audience and client segment is much more than just the reader of your journal. It includes everyone who derives value from your publication. It could, for example be the advertiser, who has a guaranteed audience for their message and the author who can use this publication as an additional publication when trying to build his academic reputation.

An academic author may, for example have a requirement for a version control function in the portal used when he submits his manuscript. The author is therefore also a client.

3.1 Who derives value from your publication and in what ways?

3.2 When planning a publication, do you conduct market research? Do you have or require in depth knowledge about your target audience? Do you investigate their specific needs or requirements?

3.3 Who do you wish to address with your publication(s)?

4. Value proposition

After the identification of the above audience and client segment, what would you say do you offer these groups to answer in their specific needs or requirements?

4.1 What publishing services do you offer?

4.2 Can you identify anything that you offer that is unique to your specific publication or initiative?

4.3 What incentive or motivation do researchers have to publish in your journal/s?

4.4 What happens if there is a specific need that you cannot answer? Do you outsource such a function in order to retain the client (for example to retain an author)?

5. Core activities and resources of the publisher/initiative (that supports the value proposition)

We have now identified the various groups that derive value from your publication offering, and also what you specifically offer them. This section will explore what you

have available to support this offering (value proposition). Resources, in this instance, do not include financial input, but may, for example be something intangible like the reputation of your journal which encourages authors to submit their research repeatedly.

5.1 Please tell me about your staff complement/company structure.

5.1.1 What is dealt with in-house?

5.1.2 Do you outsource any of the publishing functions?

5.1.3 What do you feel the reputation of your publications or initiative is in the scholarly publishing community?

6. Distribution channels

This section will explore all the routes taken by your publication to reach the reader.

6.1 How do your publications reach the reader?

6.1.1 Are there various distribution channels employed? What are they?

6.1.2 Have these always been in place or have some been included or evolved over time?

7. Income streams

Here, finally we discuss the financial aspect of your initiative or publication.

7.1 How is your initiative/publications financially supported?

7.1.1 Please indicate the various income streams associated with your publication and indicate your motivation for this choice.

7.2 How do you calculate your actual publishing costs? Could you provide me with a sample of everything that is considered when evaluating the feasibility of a publication?

8. General comments

As I indicated at the start of this conversation, you were chosen due to your prominent role in the scholarly publishing environment and your influence in the open access initiatives in the South African context. I would therefore value your opinion with regard to open access scholarly publishing in South Africa.

8.1 What is your perception with regard to open access scholarly publishing?

8.1.1 Do you believe that this is the way forward for scholarly communication? Please motivate your answer.

8.1.2 Do you believe that an open access business model is sustainable? Please motivate your answer.

8.1.3 Please identify any potential challenges with regard to open access scholarly publishing that you have experienced.

8.1.4 Please identify any positive attributes of open access scholarly publishing that you have experienced.

Thank you very much for taking part in this conversation. Your input is very valuable in my research.

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