



Southern African Research and Innovation Management Association

**Research Management:
A Handbook for Southern African Research Management Offices**

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Second edition prepared by Robin Drennan (January 2018)

Foreword

This Research and Innovation Management Handbook has been developed by the Southern African Research and Innovation Management Association ([SARIMA](#)) primarily to assist research and innovation managers to be more effective in their multi-faceted and important roles. The disciplines of Research Management, on the one hand, and Technology Transfer and Innovation Management, on the other, converge, overlap and even co-exist in the same contexts; and from the perspective of the value chain they have strong inter-dependencies and complementarities. Nonetheless, for convenience the Handbook is divided into two complementary modules. This module concerns itself with Research Management, while its sister module is focused on Technology Transfer and Innovation Management. These modules should not be read in isolation, especially by those people who are challenged with both responsibilities. As far as is possible concepts used in both modules are defined and used uniformly and consistently.

SARIMA is a not-for-profit stakeholder organisation that provides a platform for the promotion and facilitation of best practice in research and innovation management across Southern Africa. The organisation's purpose is to strengthen the research and innovation system to ensure social and economic development of the region.

The South African government's Department of Science and Technology ([DST](#)), in partnership with SARIMA, has undertaken strategically to promote research and innovation management as an institutional, national and regional priority. The intention is to do this through building capacity in research and innovation human resources and promoting enhanced networking, collaboration and co-operation between research managers, technology transfer and innovation managers and other role players within systems of innovation in South Africa and the region called the Southern African Development Community (SADC).

Research Management is recognised across the world to be a highly diverse and eclectic mix of responsibilities. In Southern Africa it is evolving into a bespoke profession with its own body of knowledge, set of principles, linked associations, formal qualifications, and human resources descriptions and specifications. Contexts in the region for Research Management, however, are highly diverse, unequal, have varied infrastructures and are differently resourced. Research Management is therefore practised inconsistently and may even be defined differently, dependent on the individual, organisational, structural and systemic calibrations. Nonetheless, some standards and norms are emerging as the profession develops and matures.

The purpose of this Handbook is twofold. Firstly, it is to provide support and encouragement to research and innovation managers to familiarise themselves with best international practice through the provision of a range of online resources, that is by no means exhaustive, but sufficient to orientate the beginner and also challenge the experienced practitioner. The online resources contained herein exist in the open domain and are open to dynamic influences. They are acknowledged through links and citations. It is self-evident that the 'know-how' and intellectual property, contained therein, are respected and complied within the light of professionalism, integrity and ethical considerations. Additionally, they should be used critically and reviewed in light of the aforementioned different contexts. Secondly, the purpose of the Handbook is to grow and develop research and innovation management in the SADC region, through the development of individuals.

Who should read this module of the Handbook? Aspirant research managers will be able to use it to explore the profession and to prepare themselves for when they might apply for a position. Established research managers should also benefit as it will expose them to the latest ideas and

developments in best practice norms. Technology transfer and Innovation managers may also find the module useful to expand their understanding of the Research Management processes so as to improve integration. Finally, academics and researchers may also find this module valuable as it will enhance their understanding of the nature of support they may receive or should expect from their institutional Research Office.

The Handbook is shared in the context of a developing profession and with the understanding that it remains dynamic and open to participatory contributions. Professionals, scholars and practitioners are, therefore, invited to *contribute* articles, case studies, materials, policy summaries and statements, guides, etc. as *links* to SARIMA (sarima@sarima.co.za) for moderation and anticipated acceptance as additional material for the Handbook. The intention is to develop a current compilation of valuable online resources.

General Arrangement of Chapters

This module of the Handbook is structured into two sections. Section 1 sets the scene by providing an introduction (in Chapter 1). Chapter 2 provides an overview of Research Management by developing a working definition and also considers the breadth of the responsibility. Chapter 3 considers the main challenges that face the profession. Chapter 4 reviews the development of the main elements of the Professional Competency Framework.

Section 2 of the module develops the nine competencies of the SARIMA-approved Professional Competency Framework, in Chapters 5 through 13:

5. Organisation and delivery of a Research Management service;
6. Research planning, strategy and policy development;
7. Researcher Development;
8. Partnerships and collaboration;
9. Research Funding;
10. Research Ethics and Integrity;
11. Managing funded research;
12. Research data and research information management;
13. Research uptake, utilisation and impact.

Most chapters conclude with a list of further resources that will add to the content of the chapter. Those resources shown in boxes are available to order at cost, the rest are free to access.

Acknowledgements

SARIMA would like to express its gratitude to the DST for the collaborative partnership that made this Handbook possible. The Professional Competency Framework, which forms the integral pillars of this resource, was developed by SARIMA with the generous financial support from Tropical Diseases Research (TDR) and [ESSENCE on Health Research](#) agencies. Finally, the contributions made by critical readers are acknowledged.

Referencing

Citation of references in this module of the Handbook follows two different approaches. Firstly, when a resource is used significantly to shape the text then it is referenced using the Harvard – Anglia 2008 style. Secondly, the many online resources (about 270 of them) that are indexed for the purposes of further reading are hyperlinked in the body of the text and the URL is given as a footnote, just in case a reader is using a hardcopy of the Handbook.

Disclaimer

While SARIMA endeavours to make this Handbook as practical and useful as possible, the outcome is somewhat constrained by the available resources. Despite SARIMA's efforts to be representative, the resources remain open to various interpretations. The inclusion of various sources does not entail an endorsement of such resources, their inherent policy positions, or the privileging of one source over another. The citation of the resources also does not represent an endorsement of specific organisations/individuals or that SARIMA is in a relationship with such organisations/individuals. The Handbook therefore is not intended to be irretrievably conclusive or exhaustive. Research Management being such a dynamic and fast changing profession will inevitably require a Handbook that remains relevant and accurate through regular revision.

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Abbreviations

| | |
|---------|---|
| ACP | Africa, Caribbean and Pacific |
| ACU | Association of Commonwealth Universities |
| APHRC | African Population and Health Research Center |
| ARC | African Research Cloud |
| ARMA | Association of Research Managers and Administrators |
| ARUA | African Research University Alliance |
| CARTA | Consortium for Advanced Research Training in Africa |
| CIARC | Consortium of International Agricultural Research Centers |
| DFID | Department for International Development |
| DST | Department of Science and Technology of South Africa |
| DRUSSA | Development Research Uptake in Sub-Saharan Africa |
| EAU | European Association of Universities |
| EARMA | European Association of Research Managers and Administrators |
| FRA | Financial Research Administration |
| HEI | Higher education institution |
| HSRC | Human Sciences Research Council |
| IF | Impact Factor |
| IDRC | International Development Research Centre |
| IAPRCB | Irish-African Partnership for Research Capacity Building |
| M&E | Monitoring and evaluation |
| MoU | Memorandum of Understanding |
| NCURA | National Council of University Research Administrators |
| NCREST | National Commission on Research Science and Technology |
| NWO | Netherlands Organisation for Scientific Research |
| NIHSS | National Institute for the Humanities and the Social Sciences |
| NRF | National Research Foundation |
| NGO | Non-governmental organisation |
| OA | Open Access |
| OCED | Organisation of Economic Co-operation and Development |
| PCF | Professional Competency Framework |
| PRA | Pre-award Research Administration |
| PRINCE2 | PRojects IN Controlled Environments |
| PMBok | Project Management Body of Knowledge |
| RAAAP | Research Administration as a Profession |
| RIMI4AC | Research and Innovation Management Improvement for Africa and the Caribbean |
| RIMS | Research Information Management System |
| SARUA | Southern African Regional Universities Association |
| SSANPAD | South Africa–Netherlands Research Programme on Alternatives in Development |
| SNIP | Source Normalized Impact per Paper |
| SADC | Southern African Development Community |
| SARIMA | Southern Africa Research and Innovation Management Association |
| SCARDA | Strengthening Capacity for Agricultural Research and Development in Africa |
| SDGs | Sustainable Development Goals |
| SJR | SCImago Journal Rank |
| SRA | Society of Research Administrators |
| StoRM | Strengthening of collaboration, leadership and professionalisation in Research Management |
| TIA | Technology Innovation Agency |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| WRC | Water Research Commission |
| Wits | University of Witwatersrand, Johannesburg |

Glossary

| | |
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| Collaboration | Partnerships and collaborations have a common meaning, namely they describe co-operative work in achieving agreed and common research goals. The term collaboration will indicate a more isolated concept of co-operation between individual researchers on a single or small number of research projects from within one university or possibly more than one. |
| Impact | Impact when used in this module to describe research does not have its meaning limited to applied research that develops technology that can enter the technology transfer and ultimately innovation stages of development. Indeed it refers to the changes brought about by high quality research on a body of knowledge (discovery research) or on policy and practice (translational research). |
| Innovation | <p>Innovation is defined as the “the <i>implementation</i> of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations”, and where ‘new’ means new to the world, new to the country or new to the firm, the latter being defined as follows (OECD and Eurostat, 2005):</p> <ul style="list-style-type: none"> • new to the world: when a firm is the first to introduce an innovation for all markets and industries, domestic and international • new to the market: when a firm is the first to introduce the innovation in its particular market • new to the firm: when a firm introduces a product, process or method that is new to that firm, or significantly improved by it, even if it has already been implemented by other firms. |
| Innovation Management | Innovation Management is defined in this document to those activities which are undertaken by a Technology Transfer Office relating to the capture, management and transfer of useful knowledge emanating from the research facilities of a public institution. |
| Institution | Institution refers to any research focused institution ranging from traditional universities, where academic freedom is a cornerstone of association to privately funded research organisations (NGO or private enterprise) with clear an unequivocal research mandates. See Figure 2 on page 3 below for a more detailed overview of this continuum. |
| Partnership | Partnerships and collaborations have a common meaning, namely they describe co-operative work in achieving agreed and common research goals. The partnership status indicates a wider agreement involving co-operation at the university or faculty level in relation to multiple research projects and often involves multiple universities, probably from different countries. |
| Planning | <p>At the strategic level, planning aims to establish commonly accepted goals and devising ways to achieve these aspirations in the medium to long term.</p> <p>Project planning, involving project management, is a short term activity that impacts on a select project with a well-defined brief, budget and bound timeline.</p> |
| Policy | Planning at the policy level supports the strategic plan and is used to guide frequent decision making. Policy is an enabling control. |
| Research | Research is a process of thorough investigation, systematic discovery and, or rigorous analysis that aims to uncover the truth, produce a deeper understanding and, or create new knowledge. Research specifically includes: the creation and development of the intellectual infrastructure of subjects and disciplines (for example, through dictionaries, scholarly editions, catalogues and contributions to major research databases); the invention or generation of ideas, images, performances and artefacts where these manifestly embody new or substantially developed insight; building on existing knowledge to produce new or substantially improved materials, devices, products, policies or processes. Research outcomes are usually (but not always) published using a wide range of channels including, but not limited to, scholarly journals, edited books, monographs, online communications or patents. The research process at universities |

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| | often (but not always) involves postgraduate students and is typically organised into projects with well-defined start and end dates. |
| Applied research | Research that creates technology that can be commercialised. |
| Discovery research | Research that changes a knowledge discipline. |
| Translational research | Research that influences practice and policy. |
| Research Management | Research management is defined fully on page 7 of the Handbook, but in essence it involves the capabilities that research-focused organisations harness so as to optimise and amplify the processes and impacts of their research activity and outcomes. |
| Research Office | Research Office includes the administrative and operational offices within universities and some science councils or commissions that house people who are engaged in the management of research. It often forms the one contact point for communication related to research whether the communication originates within or without the institution. |
| Science | The word science is always used in its broadest context in this module to indicate scholarship and knowledge. It is not limited to what is referred to as natural science of physical science. |

Section 1: Introduction, Overview of Research Management Services and Professionalization

Chapter 1: Introduction

The 21st Century world faces a myriad of problems in the social, economic, technical and environmental spheres. Many of these issues are influenced by rising inequality, increased connectivity and the impact of artificial intelligence, all of which can conveniently be referred to as the Fourth Industrial Revolution (Schwab, 2017). We will, in the future, either embrace this wave of change using it to our benefit, or our efforts to address the contemporary problems will be less than effective. Unlike previous industrial revolutions that were driven by new technology, the fourth industrial revolution challenges us to interface the latest digital developments with society. It will change work-life beyond recognition as artificial intelligence and robots overtake what we now regard a decent work. We will need to adapt to these changes by amending our education, training and development efforts. We will need to modify and revise our approaches to pressing problems taking cognisance not only of digital/human integration, but also of issues of sustainability. Past extravagant use of resources and growth driven economic models have depleted many of our natural resources and changed climatic and ecological systems, often irreversibly, questioning their very sustainability.

Research and innovation and the fresh ideas and solutions that flow from them are needed now more than ever before. It is within this context that Research Management (Schwab, 2017) is emerging as a profession in the Southern Africa region. A region which confronts the acute problems of rapid climate change; increasing burdens of communicable and non-communicable disease; energy, food and water security; rushed urbanisation; increasing poverty, inequality and unemployment; and threats to social cohesion. Thus, it is with excitement and enthusiasm that [SARIMA](http://www.sarima.co.za/)¹, with the strategic support of the South African government's [DST](http://www.dst.gov.za/)², have published this Research Management module: one of two modules making up the Handbook on research and innovation management.

Welcome to this journey into the workings of Research Management. We sincerely hope that the ideas presented will inspire you to become an effective research manager or to stimulate your development to become an even more effective research manager.

But what is Research Management? To set the scene now for later development, it may be appropriate to consider a broad overarching definition. For this we turn to Green and Langley who consider Research Management as that which “embraces anything that universities [and other research focused organisations] can do to maximise the impact of their research activity” (Green & Langley, 2009). Thus, it is by definition a very diverse set of activities that coalesce around the strategic desire to enhance the impact of research. Impact itself can be an ambiguous term. To many, in this context, it implies promoting applied research in favour of fundamental or curiosity driven research. This is not the approach taken in this module of the Handbook. Research impact is understood to arise when the quality of the published research changes a knowledge discipline, so called discovery research, or influences practice and policy, so called translational research, or creates technology that can be developed for commercial purposes, so called innovation.

¹ <http://www.sarima.co.za/>

² <http://www.dst.gov.za/>

To further contextualise Research Management it is worth considering the dynamic relationship between Research Management, and Technology Transfer and Innovation Management. The value chain from research through development to commercialisation – from idea to implementation – is illustrated in Figure 1, which is modified from work by Hughes and Kitson (Hughes & Kitson, 2012).

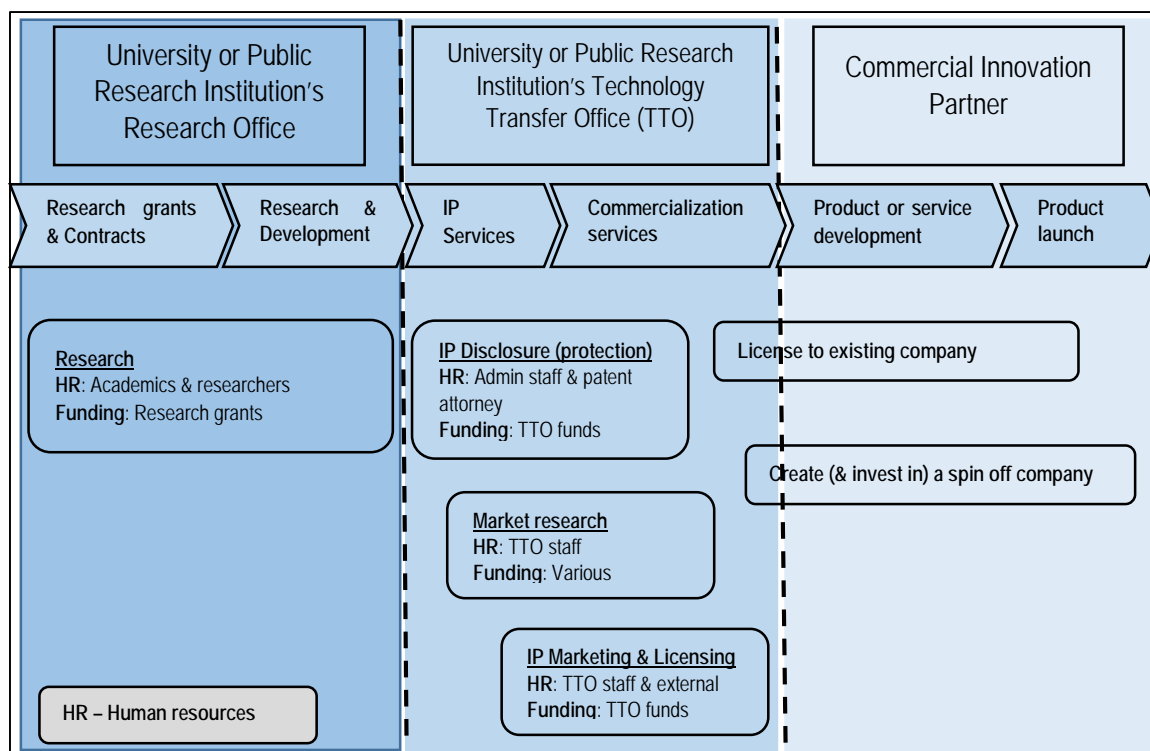


Figure 1: The value chain continuum from research through technology transfer to innovation

Source: adapted from (Hughes & Kitson, 2012)

The scope of this module of the Handbook is focused on the management of research activities (the left hand division of Figure 1), but with the understanding that for research to make an impression on creating solutions and impacting on economic development these activities should link to and integrate with technology transfer and, ultimately, innovation activities and hence the content of the Technology Transfer and Innovation Management module. However, this should not negate the value of curiosity lead research, research that produces knowledge for the sake of knowledge. Who knows when this knowledge will become vital for the implementation of a solution?

Although we have defined Research Management one should not be under the false impression that this pins down the role of the research manager to a static set of activities and responsibilities. Research Management changes with the nature of the institution within which it is practiced. Important elements include the level of emphasis given by the institution to research and innovation and the mandate of the institution (Jain, et al., 2010). A research institution's mandate can be conveniently considered to extend across a continuum from a traditional university, through technical universities³, science councils⁴, and research focused non-governmental organisations (NGOs), to private research organisations dedicated to maintaining the commercial advantage of the privately owned funding partner. Figure 2 illustrates the change of governing principles on the continuum from

³ What used to be called Technikons in South Africa and Polytechnics in other countries

⁴ Dedicated public research organisations that undertake mainly applied and translational research

a traditional university, where academic freedom is a corner stone of organisation, to privately funded research institutions with a clear and unequivocal direction.

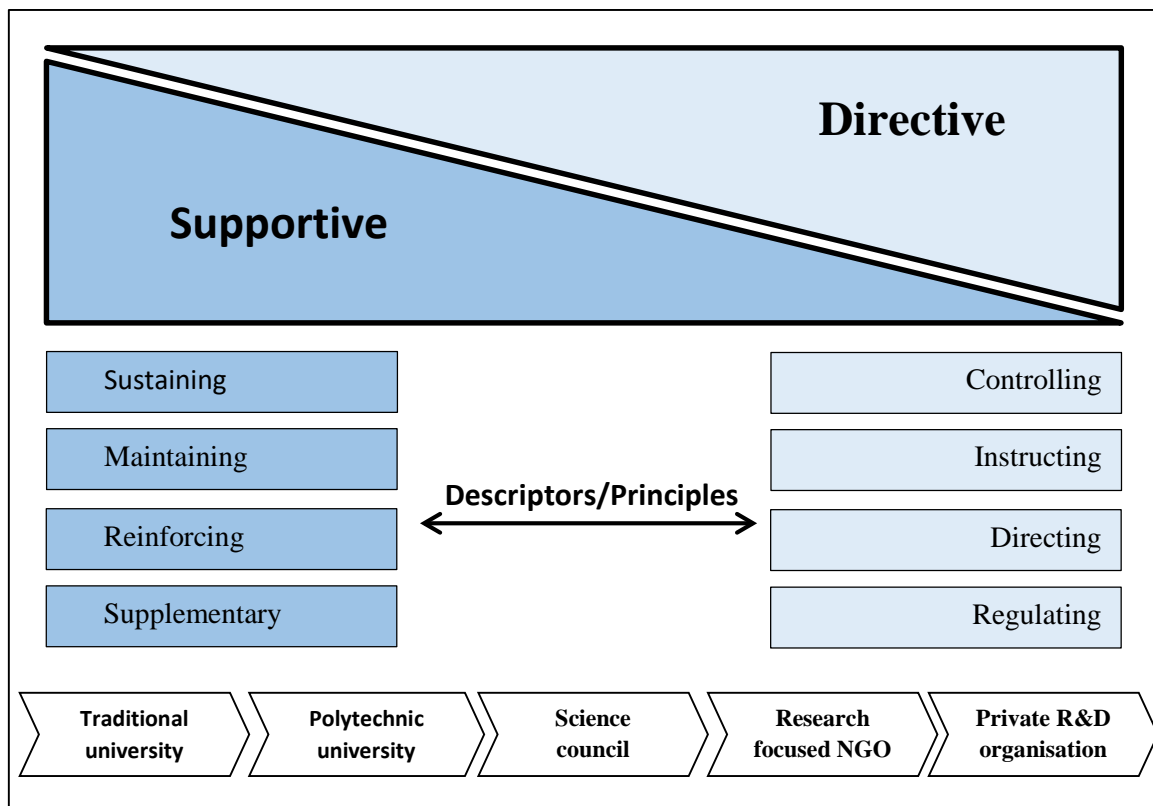


Figure 2: Different guiding principles for Research Management across a continuum of research institutions

The purpose of this module of the Handbook is twofold. It aims to enable *newcomers* to the profession to swiftly gain an understanding the dynamics and to rapidly become effective and to support the further professional development of *existing* research managers.

Newcomers: Pathways into Research Management

This part of the introductory chapter is dedicated to a discussion of how people may prepare themselves to enter the profession.

Green and Langley (Green & Langley, 2009) indicate that in some instances, individuals “fall into the career”, yet, others have been recruited through “dedicated appointments that span both professional and academic domains” (Whitchurch, 2008). According to Whitchurch, the profession tends to attract people with academic qualifications, yet who were in support roles (“quasi-academic”) and who have the capabilities to move into an academic administration or management position. Some university academics refer to this light-heartedly as “crossing over to the dark side”, the inherent criticism being that the academic has taken on a management function in an organisation that has academic freedom at its cornerstone of association. As Jain, Triandis and Weick (Jain, et al., 2010) express the notion, “managing the unmanageable”. But often these people become very effective research managers as they understand the pressures, dynamics and responsibilities of a research focused academic.

SARIMA probed this question in its action research project that gave rise to the Professional Competency Framework (that describes the major elements of Research Management). The sample of people consulted revealed that the routes through which research managers enter the profession were from:

- The academy where they were trained as researchers and have a rooted research background (with either a Masters or PhD degree);
- Management or administration without a research background;
- Management or administration with a research background;
- Other sectors such as government, funding agencies, or business. It was also noted that these people had often obtained academic credentials, such as a Masters or PhD degree, before working in these sectors.

Not only does SARIMA have a keen interest in how people enter the profession, in 2016 a large global survey was undertaken as part of the Research Administration as a Profession (RAAAP) project. The respondents to the survey numbered about 2 600 and the resulting project [report](#)⁵ (published in 2017) supports the SARIMA findings. It also gives a snap-shot of the current profile of the profession on an international stage. It probes the key skills, attitudes and behaviours of successful research administration leaders.

Whitchurch (Whitchurch, 2008), and Poli and her co-authors (Poli, et al., 2016) speak of research managers as being “blended” professionals. This idea is expanded to highlight the hybrid and multi-professional identity of Research Management. Additionally blended or “unbounded” professionals are those who are prepared to straddle multiple domains (professional, academic and service-oriented) and who are seen to have a “unique professional profile”. This profile and its integral competencies embrace the diversity of demands placed on manifold roles. The incumbents, however, often struggle in the sense of occupying a contradictory “third space” between management and administrative competencies on the one side, and with research/academia on the other side.

Existing Research Managers

No matter how you entered the profession, through experience you would have already begun to grasp the many and varied facets of the role. In a world of lifelong learning your challenge will be to use the resources provided in the manual in such a way that ‘best fit’ your circumstances to enhance your performance. The notion of best fit, while yet debated, acknowledges “a tailored, bespoke approach that takes into account the unique organisational [and individuals’] characteristics such as goals, culture and processes that can leverage relevant aspects of Best Practice” (Boxall & Purcell, 2008). Some of the chapters will (hopefully) help you improve what you are doing and others may open your eyes to what you could be doing.

As mentioned in the Forward, this Handbook is published in the context of a developing profession and with the understanding that it remains dynamic and open to participatory contributions. Professionals, scholars and practitioners are, therefore, invited to *contribute* articles, case studies, materials, policy summaries and statements, guides, etc. as *links* to SARIMA (sarima@sarima.co.za) for moderation and anticipated acceptance as additional material for the Handbook. The intention is the co-creation of this online resource.

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⁵ <https://raaapworldwide.wordpress.com>; a password protected site

Further Resources

The following resources are free and downloadable and give in-depth responses to the question, what is Research Management.

- This [book](#)⁶, entitled “Improving Your Research Management” by Professor Alan M Johnson, is published by Elsevier and to a limited extent promotes their bibliometric tools (Scopus and SciVal) which are important inputs for the management of research. The book is well written with plenty of useful information; however it may be a little too heavily focused on the USA and Canadian scenes. Furthermore, in these systems Research Management often happens at the research group, school or faculty level. As such this view is slightly different from the more common Research Management performed at the institutional level as is common in Southern Africa. Nonetheless this is a good read.
- This [website](#)⁷ was posted by the African Engagement portfolio of SARIMA, which is tasked specifically to share skills and knowledge about Research Management with aspirant (or existing) research managers in the SADC region. As such its material is more aligned with general practices (even given their great variability) in this region. It is presented in a modular format allowing the reader to pick the topic that is of most interest at the time.
- This [report](#)⁸ published by the OCED in 2005, written by Ellen Hazelkorn, is dedicated to the development of new research focused institutions. It is a valuable read for those who work in institutions that are yet to develop research intensity. It takes great care in re-defining key elements of research, scholarship and academic pursuits.

It also notes that given “the increasing competitiveness and greater geo-political significance of higher education and research, and the under-developed profile of many new Higher Education Institutions (HEIs), this study seeks to examine the processes and strategies being devised by new HEIs to grow research. By focusing on new HEIs, this book provides a unique profile of the experiences of a group of institutions that has hitherto been unidentified and unexplored. It analyses results drawn from an in-depth study of twenty-five HEIs from across sixteen countries: Australia, Belgium, Canada, Czech Republic, Denmark, Finland, Greece, Hong Kong China, Hungary, Ireland, Japan, New Zealand, Portugal, Spain, Sweden, United Kingdom.”

The following resources are free and downloadable and give a broader regional and continental context to Research Management.

- SARIMA resources for Research Management – [click here](#)⁹;
- SADC protocol on Science, Technology and Innovation – [click here](#)¹⁰;
- African Union; Science and Technology Division – [click here](#)¹¹;

⁶ <http://www.rmsinternational.com/documents/professional-development-for-senior-research-managers-and-leaders/Improving-Your-Research-Management.pdf>

⁷ <http://www.sarima.co.za/resources/>

⁸ http://www.economia.gob.cl/cnidweb/wp-content/uploads/sites/35/2015/10/University-Research-Management.-Developing-research-in-new-institutions_2005.pdf

⁹ <http://www.sarima.co.za/research-management/>

¹⁰ http://www.sadc.int/files/3013/5292/8367/Protocol_on_Science_Technology_and_Innovation2008.pdf

¹¹ <http://www.au.int/web/st-division>

- Research reports published by the [World Bank](#)¹²:

The following resources are available to order at cost.

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| <ul style="list-style-type: none">• The SAGE Handbook of Research Management, 2015, by Robert Dingwell and Mary Byrne McDonnell: https://us.sagepub.com/en-us/nam/the-sage-handbook-of-research-management/book236891. <p><i>The on-line summary states that: The SAGE Handbook of Research Management is a unique tool for the newly promoted research leader. Larger-scale projects are becoming more common throughout the social sciences and humanities, housed in centres, institutes and programmes. Talented researchers find themselves faced with new challenges to act as managers and leaders rather than as individual scholars. They are responsible for the careers and professional development of others, and for managing interactions with university administrations and external stakeholders. Although many scientific and technological disciplines have long been organized in this way, few resources have been created to help new leaders understand their roles and responsibilities and to reflect on their practice.</i></p> <ul style="list-style-type: none">• Research Management: Europe and Beyond, 2017, by Jan Andersen, Kristel Toom, Susi Poli and Pamela Miller: https://www.elsevier.com/books/research-management/andersen/978-0-12-805059-0. <p>As cited on the web-site, <i>Research Management: Europe and Beyond, 2017</i>, by Anderson, Toom, Poli and Miller addresses the myriad responsibilities related to research management and administration. The book incorporates narratives from those working in the field to provide insight into the profession. The book also offers a unique perspective on the topic by incorporating global perspectives to address the growing interdisciplinary nature of research collaboration.</p> <p>It outlines practical advice for those in the research management and administration profession at all levels of experience. It is also a useful tool that research institutions and research groups can use to assist in planning and streamlining their research support.</p> <ul style="list-style-type: none">• There are other useful “How To...” guides on the Emerald Publishers site: http://www.emeraldgrouppublishing.com/research/guides/management/index.htm <p>The leader statement says: Whatever your discipline, managing the day-to-day aspects of your research is a challenge. Get practical advice, tips and strategies to help secure the resources and develop the skills you need to manage your research project more effectively.</p> |
|--|

¹² <http://econ.worldbank.org/external/default/main?menuPK=469435&pagePK=64165236&piPK=64165141&theSitePK=469382>

Chapter 2: Overview of Research Management

Introduction

Research probes the unknown to uncover new knowledge and improve understanding. Thus, by definition, researchers work in the realm of the unfamiliar and the uncertain (Brooks, 2014). Whether perceived or not, there is also a heavy burden of responsibility on the shoulders of researchers since institutions expect increasing numbers of research publications, and governments and regions (like SADC) have great expectations of them to find solutions for contemporary problems and contribute to the development of the economy. As Ellen Hazelkorn (Hazelkorn, 2005) says; while “higher education institutions-HEIs have always behaved competitively, the new globalised economy has created a more aggressive environment” and “knowledge has become a commodity with enormous geo-political implications” for countries and regions. Thus, the maxim ‘publish or perish’ has probably never carried as much meaning as it does today.

The nature of 21st Century research is further complicated by increasing focus on the productive areas of research that are characterised by being multi-disciplinary, multi-institutional and multinational. Additionally, funding, an important enabler of research, remains competitive, and is increasingly complex to secure. Thus, in a sense research is a fragile, almost mercurial activity that needs dedicated and skilled support.

It is within this context that the responsibility called Research Management has emerged and has developed over time. Depending on the context (see Figure 2 on page 3 above) it is largely and generally a supportive function that maximises the efforts of the limited pool of researchers, although there are situations where it can also be characterised by a directive principle. It is recognised to be a hybrid profession involving an amalgam of knowledge sets that remains in flux worldwide and in Southern Africa. Thus practitioners are frequently referred to as “blended” professionals (Poli, et al., 2016). The evolution of the profession is partly driven by institutional competition, but also, and more importantly, by the rising expectation that society has for science to continue to deliver answers and progress.

Thus it is suggested that research managers act as brokers, intermediaries and helpers to enable researchers to fulfil these expectations. The research manager’s goal, therefore, is to provide leadership, support and an enabling environment for research and innovation. Effective Research Management is an essential enabler of excellent research and is critical to achieve maximum research output and impact (European Commission, 2008; Langley, 2012).

What is Research Management?

Besides the overarching definition provided in Chapter 1 – that which “maximise(s) the impact of ... research activity” (Green & Langley, 2009); it is difficult capture all the variability of the profession in a single simple definition, but many have tried. We shall begin by considering SARIMA’s working definition.

Research Management involves the capabilities that research-focused organisations harness so as to optimise and amplify the processes and impacts of their research activity and outcomes. Research Management consists of, inter alia: *research planning, strategy and policy development; research ethics and integrity researcher development; partnerships and collaboration; research funding; managing funded research; research data and research information management; research uptake and utilisation;*

organisation and delivery of a research management service. Research Management also includes transversal areas such as societal and research values, innovation, utilisation of technologies, internationalisation, knowledge management as well as simultaneous mainstreaming for equity and equality.¹³ Research management is described as a “third space between professional and academic domains” and which integrates research with that of multiple constituencies in order to maximise research impact.¹⁴

Many other definitions are provided in the referenced material listed in this chapter. By consulting these resources a much stronger definition and overview of its components will emerge. But consideration of the following paraphrased list of activities (Green & Langley, 2009) will also help to give an impression of the breadth of functions that make up the profession. Green and Langley suggest that “Research Offices [the place from which Research Management is practiced] carry out many of the functions¹⁵ shown in Table 1 below.

Table 1: The many functions of a Research Office

| | |
|--|---|
| • Development of research strategy and themes | • Networking with funders |
| • Horizon scanning | • Portfolio management & reporting, trend analysis |
| • Monitoring and evaluation, and metrics | • Project management of large contracts and bids |
| • Benchmarking | • Clinical research and governance |
| • Pre-award skills, research development and costing methodologies | • Relationship building with international funders, stewardship |
| • Internal peer review | • Knowledge Transfer and Intellectual Property |
| • Contract negotiation | • Spin outs and commercialisation |
| • Post award management and adherence to funder and statutory terms and conditions | • Audit (of technology, project progress and finances) |
| • Consultancy | • Business systems |
| • Using knowledge about individual and collaborative disciplines | • Management information and reporting |

In case all of this variability gives the wrong impression that Research Management is unsubstantial, it is important to dispel this notion by briefly considering some of its more difficult moments. Management of academic research is, according to Geoff Garrett and Graeme Davies, like “Herding Cats” (Garrett & Davies, 2010). A 2008 Guardian article by Julie Stackhouse (Stackhouse, 2008)¹⁶ indicates that university Research Management “is a fast moving profession – and one that a lot of managers are keen to move out of, tired of being ‘treated as second-class citizens’”. She goes on to describe a global survey by the Association of Commonwealth Universities (ACU) that reveals that “80% had been in their current position for fewer than five years and nearly 60% felt their next

¹³ Adapted from SARIMA Professional Competency Framework, 2016 & Langley, D and Green, J. 2009 Professionalising Research Management. *Research Global*, pp 1-39.

¹⁴ Cited in SARIMA Professional Competency Framework Report of October 2016; (Whitchurch, 2008).

¹⁵ According to the structure of this SARIMA Handbook some of these functions would be classified under the Technology Transfer and Innovation label, but at least this reinforces the notion of just how easily the functions of R&I Management blend into one and another.

¹⁶ <https://www.theguardian.com/education/2008/oct/31/association-of-commonwealth-universities-research-managers>

job would be outside Research Management (around half of those retiring are excluded). This ranges from 67% of Australasian respondents to 45% in Europe”.

The Complexity of Research Management

This slightly daunting picture leads the discussion to the examination of the complexity of the profession. However, complexity is often misunderstood as an indication of being overly complicated. Complexity is, however, so much more than that: it includes concepts of diversity, intricacy, continual change and interconnectedness all of which will become the research manager’s constant companions (Marinopoulou, 2017).

To appreciate this complexity it is necessary to begin by considering what research is. Research is a social activity undertaken by passionate scholars and researchers driven by curiosity and a deep commitment to improve their understanding and that of others. Universities and some science councils are founded on the principles of collegiality and academic freedom which presumes equality among specialists and preserves independence in the process of knowledge production and intellectual freedom. For many the notion that research must be managed fundamentally conflicts with their understanding of what it is to be an academic in a university. Academia is therefore fundamentally unmanageable, yet the intensity of global competitive conditions has required institutions to strengthen their leadership and management functions. Taylor develops these concepts in his work entitled “Managing the Unmanageable: the Management of Research in Research-intensive Universities” (Taylor, 2006). He investigates the “key management characteristics of some of the world’s leading research-intensive universities” to seek out “particular models of internal organisation, leadership, resource allocation and human resource management that lend themselves to the successful encouragement of research”.

Taylor (Taylor, 2006) stresses “that there is no ‘right’ way to manage these [research intensive] institutions; good management must reflect institutional culture, local and national circumstances and many other contextual factors.” There are, however, “some common characteristics that seem to link the [complexities of managing] research universities” which have been paraphrased as follows:

Beliefs and values:

- Commitment to academic freedom
- The need for flexible organisation
- Ambition
- A supportive environment
- A willingness to change - the reactive organisation
- The pursuit of excellence
- The importance of intra- and inter-institutional competition
- A shared commitment within the institution
- The need for risk-taking - the enterprising organisation
- The importance of performance assessment for institutional and individual development
- The importance of incentives and rewards
- Celebration of success - the appreciative organisation
- Stability of mission and purpose - consistent objectives
- Strong leadership
- Institutional self-confidence
- Trust and respect for management
- Minimal bureaucratic constraints
- An environment of openness and accountability
- Recognition that research underpins a breadth of activity.

Practice:

- Support structures to manage overall strategies
- Emphasis on research in resource allocation
- Regular use of performance indicators and targets
- Use of devolved decision making
- Large organisational units, to spread management overheads and to encourage inter-disciplinary collaboration
- Pro-active human resource management
- Selectivity in resource allocation
- Financial prudence
- Income based funding arrangements
- Minimal committee structures - short decision-making chains
- Scale of organisation; a commitment to growth and expansion
- Research that directly influences teaching (and vice versa)
- A strong international perspective
- Co-existence of pure and applied research
- Active support for the wide dissemination of research and for the application of the results of research to the benefit of society.

Further work pointing to the complexity and contradiction in Research Management comes from the report by the Research University Futures Consortium, which claims that success in American universities arises from “a high degree of programmatic self-direction, a competitive environment that rewards success, and an entrepreneurial approach to attracting the resources necessary to be successful” (Fenwick, 2012).

It is also appropriate to acknowledge the work of the ESSENCE Consortium on Health Research that has produced a document that highlights complexity in research management: “The Seven Principles for strengthening research capacity in low and middle-income countries: simple ideas in a complex world is a highly useful practice resource” (ESSENCE on Health Research, 2014).

Following on this contention of complexity, there is tremendous pressure on Research Management professionals to manage the “unmanageable”. Developing awareness around this question and finding ways of engaging researchers in a supportive way is an important skill for all research managers to develop. As discussed in the definition, they often act as *brokers, intermediaries and facilitators* who believe in the vital importance of research. These roles tend to be foregrounded in how research managers behave, rather than being controlling, dictatorial and autocratic.

Why is Research Management Important?

Researchers and academics can understandably be dismissive of the Research Management profession as it seems initially overstated as to why institutions should have a layer of people who do not necessarily contribute to research directly, but only support those who do. They ask: does it not add to the bureaucracy of organisations and divert much needed resources away from the expenses incurred by cutting edge research?

These are valid questions. However, as researchers and their postgraduate students interact increasingly with Research Management professionals they (hopefully) come to realise the value that can be added. This then is the overarching challenge for Research Management – **demonstrate the ability to add value.**

One perspective on the value of Research Management comes from Hazelkorn (Hazelkorn, 2005). (As mentioned above) she notes that there is “increasing competitiveness and greater geo-political significance of higher education and research” which therefore needs support from Research Management. The academic profession has essentially evolved under pressure from a changing world, global economy, and the fast paced nature of change brought on by globalisation, from a relaxed secluded pursuit to one with many public demands. Another perspective comes from Loreta Tauginienė who writes about “the importance of a research administrator in the areas of research management and research administration, underscoring the research administrator’s impact on the research culture in the institution” (Tauginienė, 2009).

The valuable role of higher education in knowledge production or research has been demonstrated by, for example, countries such as Finland, Germany and France as well as the newly industrialised countries. Their innovations and successful strategies for growing high-end expertise have energetically stimulated economic growth and prosperity of nations. As a consequence there is now the expectation for research to be managed strategically and profitably so as to ensure that it contributes to societal development and economic outcomes. This is evident in the ways in which resources are allocated around research, how researchers are encouraged to collaborate and the nature of knowledge required for socio-economic and development impact.

Previously Research Management was considered to be purely an administrative function required to process ‘paper work’ related to research thus relieving the researcher of this burden. However, over time the profession has grown to include more strategic requirements. The changes came about in response to the global pressures on research institutions to respond to the shift to high-paced knowledge economies and the challenges thrown up by the Fourth Industrial Revolution and the Sustainable Development Goals (SDGs) (United Nations Development Programme, 2017).

This has brought about an intense demand for high level thinking and expertise which is not only able to create knowledge but is able to convert it into societal benefits and/or competitive intelligence. As such, Research Management (and Technology Transfer and Innovation Management) have evolved into being strategic functions within organisations. The strategic contribution or roles of research and innovation managers are to (Book Series: Innovation, Technology, and Knowledge Management, 2017):

1. Contribute to the strategic thinking of institutional goals, mission and vision to stimulate relevant research; in many cases, to stimulate research growth/intensity or the entrepreneurial university.
2. Provide support to researchers to be productive, cutting edge, competitive and prepared for the knowledge economy and to grow the next generation of researchers to do the same.
3. Ensure that new incomes, business opportunities, partnerships, collaborations and resources enables institutional development and growth as part of counter-acting resource declines, averting reduced institutional quality and enabling institutional growth and sustainability.

Given the weight of these responsibilities, and the complex pressures on researchers themselves, to perform, the roles of research and innovation management professionals become increasingly critical to the future sustainability of higher education. In this sense research managers are able to make a contribution to growth, competitiveness, change and development, on many dimensions, within organisations and within the broader society.

Conclusion

This chapter makes it clear that Research Management is an eclectic profession faced with a myriad of functions; at least they all have a common vision. They aim to make research more effective. The variety and complexity of functions are extensive and calls for a special brand of practitioner – Research Administrators and Managers.

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Further Resources

The following resources, presented in chronological order, are free and downloadable and give in-depth responses to the question what is Research Management.

- In 2009, the Higher Education Funding Council for England and the UK Medical Research Council commissioned “[Professionalising Research Management](https://www.snowballmetrics.com/wp-content/uploads/2009-professionalising-research-management-2.pdf)”¹⁷ which gave further impetus to the shift from occupational understanding of Research Management to the professional positioning of research management. The leaders of the project were John Green (Chief Co-ordinating Officer, Imperial College London) and David Langley (Director, Research and Enterprise Development, University of Bristol);

¹⁷ <https://www.snowballmetrics.com/wp-content/uploads/2009-professionalising-research-management-2.pdf>

- By way of comparison, this 2009 [journal article](#)¹⁸ describes the roles of the research administrator at a university in Lithuania and is written by Loreta Tauginienė from Mykolas Romeris University, Lithuania;
- American Research Universities Futures Consortium in June 2012 released a report entitled: “The current health and future well-being of the American Research University. This [report](#)¹⁹ comprehensively addresses Research Management challenges confronting the American Research University. The authors make the comment that “[t]oday the future of the American research university is more uncertain than it has been in the last 50 years” and so the responsibility of Research Management is greater now than ever before.

¹⁸ https://www.mruni.eu/upload/iblock/fe0/l.tauginiene_4.pdf

¹⁹ https://www.snowballmetrics.com/wp-content/uploads/RIM_Report_Research-Futures-Consortium-.pdf

Chapter 3: Challenges Facing Research Management, Now and in the Future

Current Challenges Facing Research Management

The OECD conducted a study in 2000 which investigated the major challenges faced by Research Management within institutional contexts (OECD, 2004). The study report offers nine case studies developed at a range of research institutions in OECD countries. Four common themes were extracted from these case studies and they are:

1. Growing the research mission within higher education institutions;
2. Strengthening structures and processes for Research Management, and particularly devolving Research Management services down the organisation to where they are needed most;
3. Securing funding for university research;
4. Nurturing the research career.

A cursory comparison of these challenges with those that face South Africa currently, some 17 years later, shows that they are similar although the point four would probably be worded along these lines: 'human capital development and transformation'. In some SADC countries the primary challenge would be similar to point two – strengthening Research Management structures – but would also include a more creative focus in the sense of first establishing the Research Management structures and then developing them.

Another study of importance was carried out by the Research University Futures Consortium in 2012 (Fenwick, 2012). It also discussed the overarching challenges facing the top American research universities that will need to be addressed by Research Management. Although the study is now five years old and conducted in a country with the largest economy in the world there are similarities to the challenges faced in the SADC region. The trials they identified are listed below and their relevance is compared to the current SADC context:

- **Hyper-competition and complexity** – despite the collegial university environment in the SADC region, competition thrives, especially in South Africa, beyond that which may be regarded as constructive and complexity seems not to be restricted to systems with large budgets;
- **Compliance and indirect cost recovery** – indirect cost recovery remains low across the SADC region with many funders in the Global North refusing to pay for these costs;
- **Research quality and impact** – both are pressing issues in the SADC region with strong expectations for upward trajectories;
- **Planning and decision support** – are important issues in a resource constrained environments;
- **Value of the research university** – this issue is less well developed across SADC but is gaining traction;
- **Fragility of research administration and leadership** – are equally importantly in the SADC region as it is in the USA.

Will the Research Management profession in the SADC region rise to these challenges? The answer to this question lies in the motivation for developing this Handbook. It is the combined vision of the DST and SARIMA to see the rapid development of the profession so that it will rise to the challenges and will support the SADC research community to make a meaningful contribution for the benefit of the people of the region.

The Future of Research Management

Although crystallising now as a profession in the SADC region, Research Management has been around for many years and during this time has been characterised by dynamic change. Without wanting to provide an in-depth history of the profession two examples from the recent past will illustrate its ever evolving nature.

The first example comes from a 2004 journal article by Stephen Hansen and Kim Moreland (Hansen & Moreland, 2004)²⁰; they postulate that Research Management faces two distinct development challenges – the Janus face as they term it – of keeping the best of the administrative history and combining this with artificial intelligence and strategic research leadership. To quote from their abstract:

“[R]esearch administration faces a difficult dilemma. It cannot confront the future by ignoring the past, jettisoning the founding principles as irrelevant in today’s more complex environment. Nor can it resolutely cling to those guiding principles and disregard the new, demanding context in which research is conducted. Only by being Janus faced will research administrators be able to address the problems inherent in managing research and sponsored programs in today’s environment.”

The second example, published a decade later, suggests that research administration must continuously evolve because “increasingly, funding agencies prefer to back multidisciplinary and applied research, while national priorities often require research to benefit the wider community, whether it is industry, economic growth or regional development” (Sharma, 2014). He goes on to report on a meeting of “Research, Higher Education, Development, and Innovation initiatives” in 2014, which concluded that “research leaders are grappling with far-reaching changes in how research is conducted in institutions, and how they can be better prepared with new skills and training in research management”. What lies ahead for Research Management is worthy of much evidence-based study, but it is likely to use the concepts of the Fourth Industrial Revolution to guide how technology can be used to automate administrative functions, thus allowing research managers to be freed from administration to be more responsive to the human interface with their researchers.

Heading towards the third decade of the 21st Century in the SADC region there is growing pressure for Research Management to prove its value-add to Higher Education by being able to demonstrate the visible and tangible difference the profession makes through the support it provides to researchers. With this, there is a growing focus from outputs and outcomes towards impact on sustainable development and inclusive development.

The future focus will no longer be on business development, but how business development and innovation contributes toward reducing the growing inequalities and deficits in society. This is regarded as crucial as without this even the World Bank believes growing inequalities will not assist and support future sustainable development, with social and political systems under threat.

The Research Management profession has a positive future ahead of it with growing demands for effective research managers. In South Africa, for example, Research Management was declared a scarce skill with implications for work permits, while the OECD and various popular publications reflect on the growing need for capable research managers and research leadership.

²⁰ <http://files.eric.ed.gov/fulltext/EJ1070349.pdf>

Conclusion

Research Management across Southern Africa currently faces challenges of growing research culture in higher education institutions, strengthening its own structures, sourcing funding for university research and nurturing the careers of the next generation of researchers. The future of the profession looks promising. There are increasing demands for more research managers and especially those that can embrace new technologies to automate administration. The human element of Research Management is also growing in importance – good people skills are important for stewardship. However, the profession will continually need to assert itself as a value adding function. Its future will ultimately depend on how well it can support the delivery of social, economic and ecological impact through knowledge creation and uptake.

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Further Resources

This free online resource illustrates some further challenges facing Research Management.

- This 2006 [review](#)²¹ in the OECD Higher Education and Policy covers the following topics:
 - Managing the Unmanageable: The Management of Research in Research-intensive Universities by John Taylor
 - Incorporation and University Governance: A Comparative Perspective from China and Japan by Futao Huang
 - The Professional Doctorate: From Anglo-Saxon to European Challenges by Jeroen Huisman and Rajani Naidoo
 - Widening Access through Partnerships with Working Life by Andrew Casson
 - The Politics of Access: Measuring the Social Returns on Post-secondary Education by Michael Conlon
 - Evaluation of the Competence Reform in Norway: Access to Higher Education Based on Non-formal Learning by Vibeke Opheim and Håvard Helland
 - Where are the Boys? Gender Imbalance in Higher Education by Fred Evers, John Livernois and Maureen Mancuso
 - Promoting a Lifelong Learning Society in China: The Attempts by Tsinghua University by Aiyi Wang, Gilsun Song and Feiyu Kang

This free online resources focus on benchmarking and measuring effectiveness.

- [Measuring effectiveness](#)²² of research and innovation management at the policy and institutional level in Cambodia, Malaysia, Thailand and Vietnam.

These online resources illustrate the evolution of management.

- The [evolution of management](#)²³ tracking the industrial revolutions from the late 1800s;
- [What do managers do](#)²⁴? Moving from ‘planning, leading, organising and controlling’ to roles related to interpersonal, informational and decisional activities.

²¹ <https://www1.oecd.org/edu/imhe/42348780.pdf>

²²

<https://www.oecd.org/sti/Effectiveness%20of%20research%20and%20innovation%20management%20at%20policy%20and%20institutional%20levels%20Meek%20and%20Olsson.pdf>

²³ <https://youtu.be/EobeHwOw3S4>

²⁴ <https://youtu.be/NgkQYRqxKTs>

Chapter 4: The Professional Competency Framework

Introduction

As presented in previous chapters, there are great expectations of research to make an impact on the wellbeing of the people in the SADC region. Research Management is likewise expected to contribute to this impact through insightful leadership, supportive administration and creative development. The combined DST and SARIMA strategy to deliver on the expectation is to professionalise Research Management (Pillay, 2017). Thus in line with global trends, SARIMA with acknowledged partners, initiated a professionalisation project to offer to its membership and (African) partners, an authentic stakeholder-Association led professionalisation process.

Historically speaking, SARIMA's commitment to this project began in 2010 when it adopted professionalization of research management as a strategic goal. This goal evolved into the implementation of the Capacity Building and Professionalisation thrust between 2010 and 2016. Sessions at annual SARIMA conferences, starting in 2015, were dedicated to the debate of the creation of a professional development or competency framework. Now complete, the SARIMA Professional Competency Framework was approved in 2016.

The Framework arose from a dedicated project that included action research, using deep focus groups with SARIMA and other stakeholders. The empirical data were complemented by an extensive literature review which discerned global patterns around professionalisation. The draft iterations of the Framework underwent numerous verification and quality assurance stages to ensure that it met exacting requirements of validity, reliability, analytical generalizability, credibility and trustworthiness. The Framework is available at this [link](#)²⁵.

An overview of the Professional Competency Framework

SARIMA's Professional Competency Framework consists of nine competencies as summarised in Table 2. The nine competencies form the basis of the nine chapters in Section 2 of this module of the Handbook.

Table 2: Professional Competency Framework consisting of 9 key competency areas

| Key competency area | High-level description of the area |
|--|---|
| 1. Organisation and delivery of a research management service | Organise, structure, manage, monitor and review a research support function |
| 2. Research planning, strategy and policy development | Facilitate and support the development, implementation, monitoring and evaluation of research policy and strategy across the competency areas |
| 3. Researcher Development | Support postgraduate student and researcher development across the research pipeline within different organisational settings |
| 4. Partnerships and collaboration | Facilitate and manage national, regional, international partnerships and collaborations to advance research including with research organisations, funders, industry, government and society |
| 5. Research Funding | Identify and disseminate funding opportunities; develop and implement funding optimisation strategies; support the writing of funding proposals, including alignment with stakeholder requirements, budgeting and costing and review; coordination of |

²⁵ <http://www.sarima.co.za/professional-development/>

| | |
|---|--|
| | approvals and submissions (usually associated with pre-award activities) |
| 6. Research Ethics and Integrity | Promote, foster and support research ethics and integrity, compliance and responsible research conduct |
| 7. Managing funded research | Research contracts negotiation and management; research financial management; funder/sponsor engagement and liaison; research project management (usually associated with post-award activities) |
| 8. Research data and research information management | Develop research data management plans and support systems; databases and information systems; research data management; reporting |
| 9. Research uptake, utilisation and impact | Dissemination and communication of research; knowledge transfer; business development; measuring and demonstrating research impact |

Source: SARIMA

The interrelations between these competencies are illustrated in a graphic representation of the Framework in Figure 3. The nine competencies (labelled 1 through 9 in the inner circle of Figure 3) are normally acquired progressively or are required from three hierarchical levels of work typically found in the Research Management environment, namely: (i) administrative/operational, (ii) management and (iii) leadership/strategic. The colour scheme used in Figure 3 should not be over interpreted to indicate a match between competency and the hierarchy of work functions. The colours are used simply to differentiate the various entries.

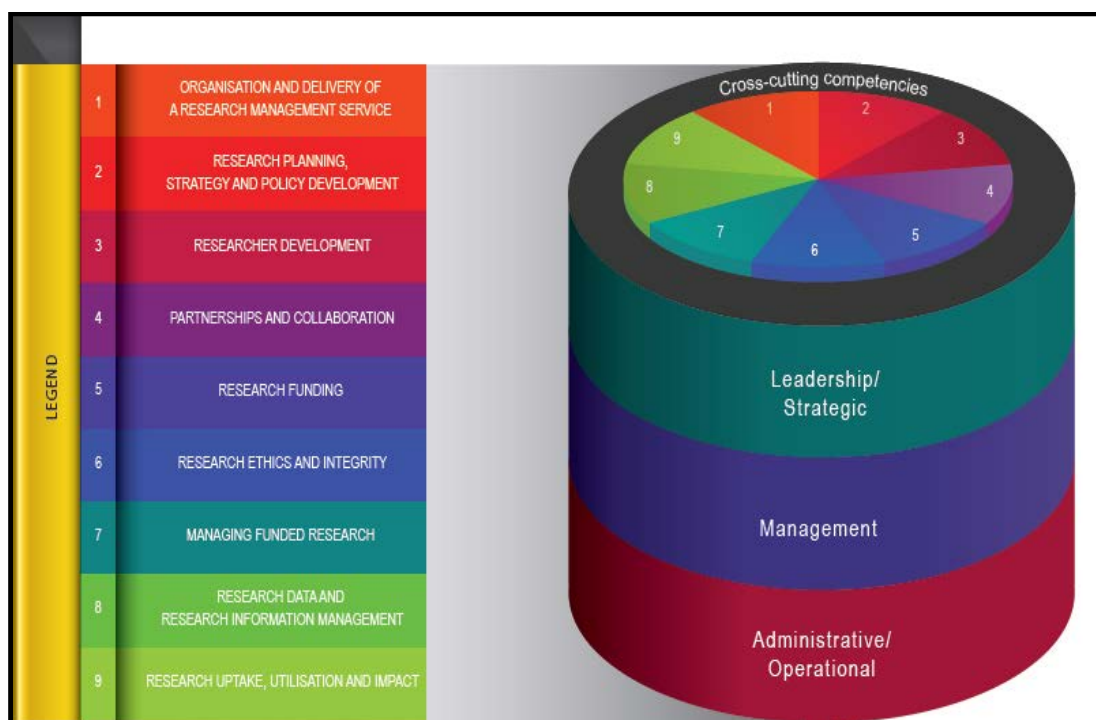


Figure 3: Graphic illustration of the SARIMA Professional Competency Framework

Source: SARIMA, 2016

Aside from the above, the Framework also covers transferable (crosscutting) competencies which include, but are not limited to:

- **Interactive communication** – listening to others, clearly conveying information and ideas through different media to individuals or groups in a manner that is engaging and fosters open communication;
- **Conflict resolution** – using a variety of approaches to manage and resolve concerns, disagreement, and conflict, facilitate the prevention, management and/or resolution of conflicts;
- **Personal effectiveness** – maintaining effective behaviour in challenging situations having the resilience to bounce back in the face of setbacks, demonstrating a strong desire to advance, recognising personal strengths and gaps and engaging in ongoing development, self-motivated, honesty and integrity in professional conduct;
- **Researcher focus/ stewardship approach** – strong commitment to respond to and anticipate needs of researchers, striving to ensure satisfaction with the delivery of services and support and developing and sustaining productive relationships;
- **Organisational awareness** – awareness of organisation's research goals, understanding the organisation's formal and informal systems, maintaining cross-functional focus and using the most appropriate channels to communicate within and between departments/divisions/units, awareness of organisational relationships and external influences;
- **Diversity valuation** – appreciating and leveraging capabilities, insights and expertise in an inter/multi/trans-disciplinary manner, valuing and incorporating contributions, demonstrating respect for opinions and ideas of others;
- **Adaptability** – maintaining effectiveness when experiencing major changes in the work environment; adjusting effectively to work within new work structures, systems, processes, requirements, or cultures;
- **Technology leverage** – seeking out ways to employ technology to optimise organisational and individual research performance;
- **Nurturing innovation** – applying original thinking to job responsibilities to improve processes, methods, systems, or services.

Realising the Benefits of the Professional Competency Framework through Partnerships

SARIMA continues to realise benefits from the professionalisation process through three multi-institutional partnerships.

1. Strengthening of collaboration, leadership and professionalisation in Research Management (StoRM)

Stellenbosch University's Division for Research Development (their Research Office) is the lead South African institution in a European Union – Erasmus+ programme called "Capacity Development in Higher Education" – funded project focused on Research Management professionalisation. This multi-institutional project involves consortium partners from Bristol University (UK), Copenhagen University (Denmark), Kaunas University of Technology (Lithuania), the University of the Western Cape (South Africa), the University of Namibia, the Namibian University of Science and Technology, the University of Botswana, the Botswana College of Distance and Open Learning, and SARIMA. The ACU, Thompson Reuters Pty Ltd, the European Association for Research Managers and Administrators and the UK Association for Research Managers and Administrators will also act as associate partners in the project. The [StoRM](http://www0.sun.ac.za/pgstudies/news/eu-funding-to-boost-research-management-in-southern-africa.html)²⁶ project develops Research Management capacity through an exchange programme and curriculum development for diploma and degree courses.

²⁶ <http://www0.sun.ac.za/pgstudies/news/eu-funding-to-boost-research-management-in-southern-africa.html>

2. Strengthening the capacities of Science Granting Councils in Sub-Saharan Africa

SARIMA, funded by the National Research Foundation (NRF) of South Africa, the UK's Department for International Development (DFID), and Canada's International Development Research Centre (IDRC), is part of an initiative that aims to strengthen the capacities of science granting councils in Sub-Saharan Africa. The purpose of this is to support research and evidence-based policies that will contribute to economic and social development of the region. More information on the Science Granting Councils Initiative project can be sourced from this [link](#)²⁷.

3. The Role of Association of Research Managers and Administrators (ARMA) Professional Development Framework

SARIMA was able to draw benchmarks for its Professional Competency Framework from ARMA. The ARMA Professional Development Framework (PDF) was developed after a 12-month project which involved various research management and higher educational stakeholders and is well described at this [link](#)²⁸. In essence the PDF "describes the activities, knowledge, skills and behaviours required across the full range of research management and administration roles".

"The PDF enables ARMA and partner organisations to build professional development opportunities for research managers and administrators; helps individuals to reflect on their development needs and plan their careers; informs institutions' internal training and development for research managers and administrators; and helps managers in the task of preparing job descriptions and person specifications."

The PDF covers 21 functional areas under seven themes, each viewed from an operational, management and leadership perspective. The themes are:

- Developing Proposals
- Project Lifetime
- Translation
- Postgraduate Researchers
- Policy and Governance
- Management Information & Related Functions
- Service Organisation and Delivery
- Policy and Governance

Conclusion

Professional development/competency frameworks provide value for the busy Research Management professionals who often do not consider their own career and professional development. SARIMA's Professional Competency Framework consists of nine competencies which are performed at three levels: operational, managerial and strategic. It is hoped that the Framework will help individuals to develop their skills and enhance their knowledge and as highlighted to stakeholders, in the "PCF Short Report" (an internal document), "stakeholder organisations and individuals may use the PCF to help them assess skills levels, write job descriptions, plan professional development and career paths, benchmark practices, design organisational training interventions, ensure considered succession planning, and guide individual professional development.

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Further Resources

These free online resources focus on the professionalisation of Research Management.

²⁷ <http://www.nrf.ac.za/media-room/news/first-forum-science-granting-councils-initiative-sub-saharan-africa>

²⁸ http://www.uhr.no/documents/PFA_5_Professional_Development_Framework_WEIR.pdf

- This [link](#)²⁹ leads to a paper by David Langley and John Green that proposes that although Research Management has developed over time, no framework for training has yet emerged. They discuss the results of a 2009 study of 20 English universities.
- On the other side of the globe, [Research Management Service International](#)³⁰, an Australian company, offers research management consultancy service and professional development for senior managers and leaders.

Professional organizations are primary to the development of professional standards as they share information and best practice through training, webinars, conferences, newsletters and journals. Besides SARIMA in the SADC region, other such resources include the Society of Research Administrators ([SRA](#)) and the National Council of University Research Administrators ([NCURA](#)). Each of these organizations sponsor regional and sectional meetings, webinars, topical meetings – such as Pre-award Research Administration ([PRA](#)) and Financial Research Administration ([FRA](#)) – and NCURA hosts the newly launched NCURA [Collaborate](#) networking forum. SRA's Journal of Research Administration and the NCURA journal, Research Management Review, publish substantive articles relevant to our work. And, for many, the Research Administration Discussion List ([ResAdm-L](#)) listserv is an indispensable resource. Information about other professional bodies that support Research Management can be found at this [link](#)³¹.

The following resources are available to order at cost.

More on professionalising research management:

“University Research Management Meeting the Institutional Challenge” by Connell Helen, OECD Publishing, 18 Jan 2005, 260 pages.

https://books.google.co.za/books?id=xs2Wd3o2IKsC&pg=PA11&lpg=PA11&dq=Professionalisation+of+research+management&source=bl&ots=7FQEuFY3c9&sig=yBx1RtrKG5uu4W1N3o4tDzgEAg8&hl=en&sa=X&ved=0ahUKEwixjaDKrcbRAhVDC8AKHfqwB_Y4ChDoAQhLMAC#v=onepage&q=Professionalisation%20of%20research%20management&f=false

²⁹ <https://www.snowballmetrics.com/wp-content/uploads/2009-professionalising-research-management.pdf>

³⁰ <http://www.rmsinternational.com/professional-development-for-senior-research-managers-and-leaders.php>

³¹ <http://www.researchadministrationdigest.com/resourcesforera/>

Section 2: Chapters Framed by the Professional Competency Framework

Chapter 5: Organisation and Delivery of a Research Management Service

Introduction

Having discussed the definition and full meaning of the complex function called Research Management in great detail in Section 1, it is now necessary to examine the framework of competences that are necessary to be an effective research manager. The first competency to examine is that which is necessary to organise and deliver the required strategic, managerial and administrative services.

The Professional Competency Framework describes this key competency as the ability to *“organise, structure, manage, monitor and review a research support function”*.

Organisational Arrangements for Research Management

Given the responsibility to provide administrative, management and strategic support, where best should the Research Office be positioned in the research organisation to deliver on the promised value? The pros and cons are discussed in the “Journal of the Programme on Institutional Management in Higher Education” (OECD, 2006), but the management axiom that organisational forms should follow strategy is meaningful in this context.

Interestingly, the position of the Research Office within organisational structures has changed over time in response to three main factors: (i) the evolution of Research Management itself, (ii) the location of the institution (refers here mainly to universities) along the continuum from teaching focused institutions to research intensive institutions, and (iii) the local context. This variability of Research Management in organisational spaces is highlighted by Green and Langley (Green & Langley, 2009). In the SADC region, and indeed in South Africa, there are examples of institutions at each of these stages of development and so a study of existing organisational structures in different institutions should reflect the typical trajectory of organisational change over time.

Consideration of some examples in different universities³² will reveal (below and in Figure 4) the typical course of this trajectory. When Research Management is first introduced into an institution, often the expectations of it are largely focused on administrative functions, with little specialisation. In this case the Research Office can be located in the division of the university Registrar (or similar administrative location). Some institutions have a projects office tasked to manage the institution’s strategic projects (ICT or other projects). This is especially true when the institution is undergoing significant change. The Research Office can, in these cases, find a suitable home in this structure. Here the expectation of the Research Office is more than simple administration, but the full recognition of the impact of Research Management is not yet fully appreciated and little specialisation is allowed beyond normal project management processes. In some universities the Research Office is located with the Deputy Vice-Chancellor for Academic affairs. This typically indicates that more is expected of the Research Office than administration, but the level of specialisation remains low because academic affairs includes a combination of widely varying responsibilities such as teaching and learning, research and academic citizenship. It is only when a high degree of research intensity is achieved that a university is likely to have the Research Office located in the management line of a Deputy Vice-

³² The names of the universities are kept confidential as they are the subject of a journal article which is currently under review

Chancellor for Research and Innovation. This organisational arrangement normally is paralleled with the highest levels of expectation for strategic input from the Research Office. A high degree of specialisation is also achieved in this structure, especially so when the research and innovation management functions are separated.

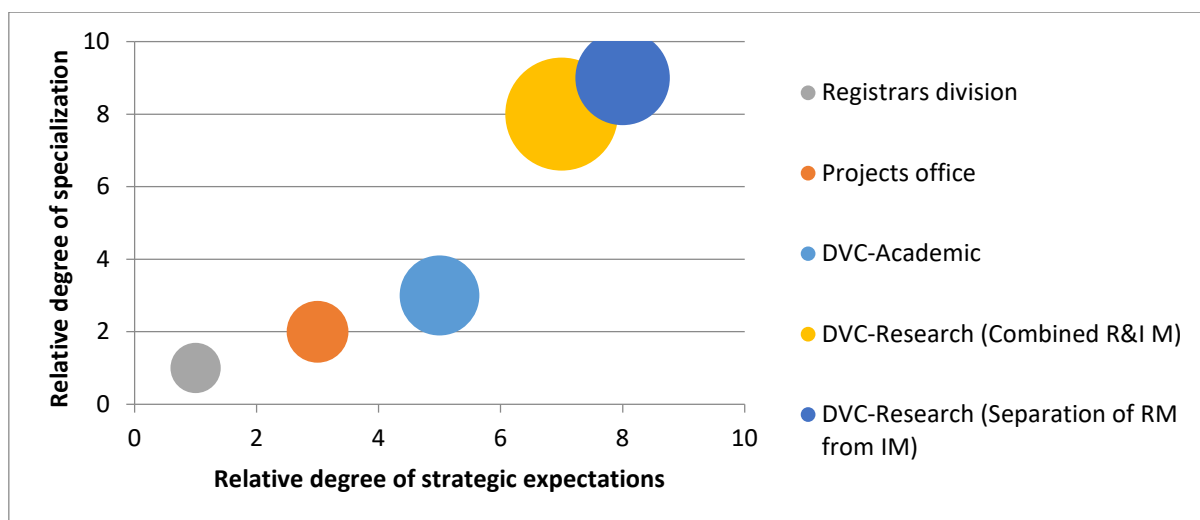


Figure 4: Organisational positions for the Research Office, where the size the circle represents the relative size of the Research Office

To conclude this section, it is worth quoting one senior and experienced SARIMA executive who said that “the right institutional structure is less important or even unimportant when compared with the ability of the research manager to establish good working relations and communication channels with the academics of the institution” (Romanowska, 2017).

Structure of a Typical Research Office

The title of this section is a little misleading because there is no such thing as the ‘typical Research Office’. Why? Because its structure is shaped by the strategic expectations of the Office - there is no magic blueprint to produce the perfect Research Office. As with the positioning of the Office in the organisation (discussed above) so too will the circumstances shape the structure. Thus, the best advice that can be shared is to ensure there is capacity to deal with every functional demand placed on the Office.

To address this practically, one can take the list of typical demands that can be placed on a Research Office, see “What is Research Management?” on page 7 above, and cluster them around skills sets needed to fulfil them, thus allowing one to map a typical structure. Then by selecting the functions that are meaningful in your circumstances develop the best structure for your Research Office. Please see the [Appendix](#) for more detail on this exercise.

Benchmarking Research Management

Having placed the Research Office in the correct organisational line and having structured it according to the strategic demands, how will you know if it is functioning optimally? Benchmarking Research Management performance and practice between institutions is one way to answer this question. Two benchmarking initiatives available in the SADC region are presented here with the hope that aspiring research managers will engage with these or similar and so collectively raise the standard of Research Management in the region.

Firstly, SARIMA is integrally involved with benchmarking through its partnership with the ACU that initiated the Research and Innovation Management Improvement for Africa and the Caribbean (RIMI4AC) project. This collaborative project aimed to achieve “the improvement of research and innovation management capacity in Africa and the Caribbean for the successful stimulation and dissemination of research results.” It was funded by the Africa, Caribbean & Pacific (ACP) Science and Technology programme and is described in this [YouTube](#)³³ video.

The project brought together participating universities into a forum for practical discussion, performance comparison and improvement of Research Management provision. Fourteen Southern African universities representing all the SADC countries contributed to the data gathering process and benefited from the cross referencing exercises. Post the conclusion of the RIMI4AC project the ACU continued with the annual benchmarking survey called the *ACU Measures*, with the objective of not to “rank institutions, [rather] ACU Measures helps universities to compare and contrast their practices and policies with their peers, supporting senior university management in decision-making and strategic planning. ACU Measures covers four areas: institutional profile, academic salaries and benefits, research management and gender” (ACU, n.d.)³⁴.

“ACU Measures enables one to:

- Benchmark your institution’s performance over time and demonstrate the impact of managerial changes;
- Learn about performance in a given area;
- Define your own comparison groups and produce individualised reports, tables and charts;
- Use the results to make a case for resources, staff or training;
- Share experiences and good practice with international colleagues;
- Identify which issues are specific to your institution, as opposed to national or regional.”

Research Offices may contact the [ACU](#) directly or get in touch with [SARIMA](#) to be part of the SARIMA-DST partnership that sponsors Southern African research management benchmarking.

Secondly, the LH Martin Institute (LH Martin Institute, n.d.)³⁵, at the Melbourne Centre for the Study of Higher Education has an active project on benchmarking with regard to the performance of research and innovation. This Institute works in partnership with institutions and organisations to benchmark organisational practices that influence performance of research and innovation. They also work collaboratively with partners to develop customised professional development programs, to improve the performance of research and innovation. Their rationale is described as such:

“The changing conditions for the organisation and conduct of research have increased the complexity in leading and managing research institutions. As a result, there has been a growing professionalization of research leadership on the one hand, and greater emphasis on management accountability on the other. High level leadership and management skills are therefore integral to institutions seeking to pursue strategic priorities to achieve excellence in research.”

³³ <https://www.youtube.com/watch?v=tDsR1opdbry>

³⁴ <https://www.acu.ac.uk/membership/acu-measures/>

³⁵ <http://www.lhmartininstitute.edu.au/research-and-projects/projects/39-benchmarking-performance-of-research-and-innovation>

Participation can be arranged via their [website](#)³⁶ or by contacting Åsa Olsson, Program Director, LH Martin Institute (asa.olsson@unimelb.edu.au, +61 3 9035 7508).

Conclusion

This chapter addresses how best to organise Research Management professionals to deliver on the administrative, managerial and strategic deliverables. Firstly, the best place for a Research Office in the organisation was explored, and secondly, the ideal Research Office structure was examined. Definitive answers were not forthcoming because current circumstances are so influential in making these decisions. Nonetheless tools were shared with the aim of assisting people to make these decisions. Finally, benchmarking was discussed as a way of bootstrapping Research Offices' performance to meet the challenges.

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Further Resources

The following resources provide more insight into the management, organisation and structuring of an effective Research Office.

- The ACU [report](#)³⁷ entitled: “Research management in African universities: from awareness raising to developing structures” of 2013 discusses the research management function as assessed in African countries belonging to the Commonwealth. The value of this report is that it is focused specifically on the African context and so is immediately relevant. One of the overarching recommendations of the report is that while structures have been developed, systems still need to be developed. Their definition of Research management is regarded as “any action that a university can take to improve the effectiveness of its researchers, but which is not part of the research process itself”;
- ESSENCE on Health Research has produced highly accessible guides on a range of good practices in research and Research Management. These include:
 - “[Five Keys to improving research costing in low-and middle-income countries](#)”³⁸ (2012). The Five Keys also has a useful set of resources contained in a [training module](#)³⁹;
 - “[The Seven Principles](#)”⁴⁰ for strengthening research capacity in low and middle-income countries: simple ideas in a complex world is a highly useful practice resource” (2014). “[H]ow best to strengthen research capacity with the maximum possible benefit ... in a non-prescriptive manner”;
 - “[Six Practices](#)”⁴¹ to strengthen Evaluation for Research Development” (2016).
“This report recommends the following six best practices to consider for research evaluation:
 - *Build on established evaluation standards.*
 - *Develop rigorous design, approaches, methods and metrics.*
 - *Consider values.*
 - *Identify users and intended uses of the evaluation.*
 - *Plan according to the anticipated timeline of influence.*

³⁶ <http://www.lhmartininstitute.edu.au/research-and-projects/projects>

³⁷ https://www.carnegie.org/media/filer_public/df/ca/dfcac790-1792-4e8e-a7ea-b19ef174d403/ccny_report_2013_awareness.pdf

³⁸ www.who.int/tdr/publications/five_keys/en

³⁹ <http://www.who.int/tdr/publications/using-five-keys/en/>

⁴⁰ <http://www.who.int/tdr/publications/seven-principles/en/>

⁴¹ <http://www.who.int/tdr/publications/six-practices/en/>

- *Foster collaboration among diverse stakeholders.*
- [“Planning, Monitoring and Evaluation Framework for Research Capacity Strengthening”⁴²](#) (2016);
- For additional frameworks useful for Research Management – [click here](#)⁴³, [here](#)⁴⁴ and [here](#)⁴⁵.

The [ESSENCE Consortium](#)⁴⁶ indicates that “ESSENCE on Health Research is an initiative that allows donors and funders to identify synergies, bring about coherence and increase the value of resources and actions for health research”.

⁴² <http://www.who.int/tdr/publications/essence-framework-2016/en/>

⁴³ <http://www.who.int/tdr/partnerships/essence/en/>

⁴⁴ www.who.int/entity/tdr/publications/topics/capacity-strengthening/en

⁴⁵ www.who.int/entity/tdr/publications/non-tdr-publications/essence-framework/en

⁴⁶ http://www.who.int/tdr/partnerships/essence/Flyer_Essence_2017_web_version.pdf?ua=1

Chapter 6: Research Planning, Strategy and Policy Development

Introduction

This chapter focuses on the Research Management competencies related to the development, implementation, and monitoring and evaluation of research plans, policies and/or strategies.

The Professional Competency Framework describes this key competency as the ability to “Facilitate and support the development, implementation, monitoring and evaluation of research policy and strategy across the competency areas”. The Framework further disaggregates this competency into two logically separate, but related sub-areas, namely:

1. Sub-area: To facilitate and support the development and implementation of research policy and strategy;
2. Sub-area: To monitor and evaluate research policy and strategy.

Some of the material presented in this chapter in support of the planning, strategy and policy development competency is drawn from strategy planning and management that are generically relevant to diverse organisational contexts including, but not limited to research.

Key Concepts

The concepts of strategy, policy and planning can often be confusingly similar and are, in some texts, used interchangeably, which adds to the confusion. There is considerable debate in the literature about the meanings of these concepts and the interested reader is pointed to two such debates amongst *ResearchGate* communities ([debate-1](#)⁴⁷ and [debate-2](#)⁴⁸). Two more formal resources that attempt to resolve the debate are the Management Study Guide (MSG, 2017) and the website called the *DifferenceBetween.com* (Difference Between, 2017). Following the debate certainly gives insight into the meanings of these concepts, but for the sake of simplicity this module of the Handbook will assume⁴⁹ the following meanings:

- **Strategy** is developed primarily to set goals that will be achieved hopefully in the medium to long term;
- **Policy** is then developed or adjusted to support the strategy and to guide frequent or regular decision making;
- **Planning** is used both in the strategic sense (medium to long term planning) and the tactical sense (short term plans aimed at implementing a strategy), with the meaning clearly apparent from the context.

Strategic Planning

Strategic planning and implementation are valuable phases of a continuum that allows managers to conceptualise, plan for, and focus on the organisational goals, outcomes and impact. There are many approaches to developing strategy available and any visit to the literature will reveal an often confusing array of strategic planning approaches and implementation processes. A limited number of these will be summarised below.

⁴⁷ https://www.researchgate.net/post/Which_comes_first-strategy_policy_or_planning

⁴⁸ https://www.researchgate.net/post/What_is_the_difference_in_meaning_of_the_terms_policy_planning_and_strategy

⁴⁹ Similarly to [Shaheen Akter](#) of the Open University, UK

A simple approach to strategic planning can be guided by the notion of an overland journey directed by a road map. The **starting point** for the journey represents the place where the organisation is at present. This is normally determined using a [SWOT](#)⁵⁰ analysis that considers strengths, weaknesses, opportunities and threats. These are best determined using a collective of key role players and goes some way to ensuring buy-in to the final strategic plan. The destination or **end point** on the map is akin to the strategic goals and aspirations of the organisation. These need to be [SMART](#)⁵¹ goals, that is specific, measureable, achievable, relevant and time bound goals that are also inspirational.

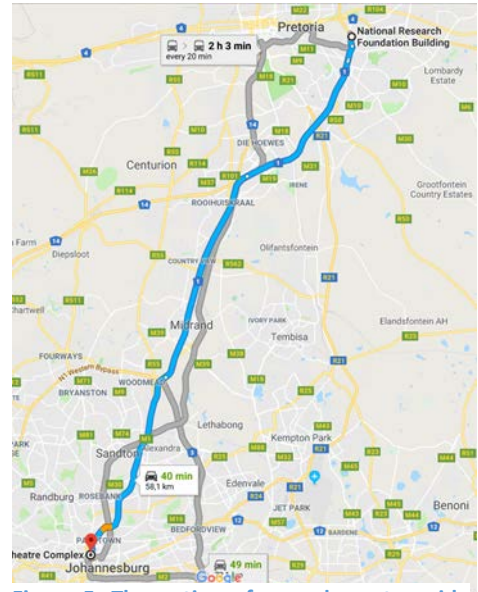


Figure 5: The notion of a roadmap to guide strategic planning

As shown in Figure 5, there is often more than one route between the starting point and the end point. It is these routes that are determined by policy and operational tactics, also referred to as the implementation plan. It is entirely possible that due to changing circumstances that the chosen route is abandoned mid-journey so as to avoid an obstacle. However, to be effective it is important to remain true to the end point so as to realise the agreed goals and strategic aspirations.

More contextually relevant approaches to strategic planning are given in the books by Smith, “Managing the Research University” (Smith, 2011) especially chapter three, and by Jain, Triandis and Weick, “Managing Research, Development, and Innovation”, especially chapter 16 of the third edition (Jain, et al., 2010).

Smith emphasises the need for getting buy-in and broad support for the strategic plan in universities where academic freedom is a highly influential principle. This buy-in is so important that it is probably “more important than including an array of specific intentions”. In this context Smith promotes the concept of opportunism, that is preparing the organisation to respond rapidly and with agility to changing circumstances.

Jain, et al., are more pragmatic and considers strategy using a simple mathematical equation:

$$\text{Strategy} = \text{Ends} + \text{Ways} + \text{Means}$$

where

| Component | Definition |
|-----------|---|
| Ends | = Objectives towards which one strives |
| Ways | = The chosen course of action |
| Means | = Instruments by which some end can be achieved |

Source: (Jain, et al., 2010)

Another excellent resource, which being produced in South Africa is contextually more relevant than those resources discussed above, is the book entitled “[Strategic Planning: A guide for higher](#)

⁵⁰ https://www.mindtools.com/pages/article/newTMC_05.htm

⁵¹ <https://www.mindtools.com/pages/article/smart-goals.htm>

[education institutions](#)⁵² that was published by [CHET](#)⁵³ – the Centre for Higher Education Trust. Chapter two is a free download and shapes the discussion using these headings:

- Why is Strategic Planning Important? • What are the Keys to Strategic Planning Success? • How Does Strategic Planning Focus Institutions? • What is the Role of Leadership in Successful Strategic Planning? • How Does Strategic Planning Fit into the National Policy Framework? • What are the Major Elements of a Strategic Plan? • Who Should Participate in the Strategic Planning Process?

One of the strength of this resource is the use of real examples from local SADC universities (and some international ones), for example, the mission statement of the University of Pretoria is provided as an illustrative example. The text also provides insightful pull-quotes such as “Planning results in decisions” (p 12). The charter also has a section that importantly links strategy to budget and used this quote to illustrate the point: “The primary function of the budget is to span the distance between intent and action” (Jones, 1996).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) provides a comprehensive [overview](#)⁵⁴ of strategic planning techniques and methods with reference to planning for the education sector. What this shows is the systematic and logical nature of strategic planning. It offers techniques and methods such as the **Problem Tree** and **Logical Framework Matrix** for planning.

Some of the best practice points that are paraphrased from the Centre for Applied Research [briefing notes](#)⁵⁵ on strategy development, entitled “A Summary of Best Practice Approaches in Strategic Planning Processes” (Centre for Applied Research, 2005) include:

- Use “stretch goals” to drive strategic out-of-the-box thinking;
- Strategic planning processes should be evolving and flexible – a “continuous improvement” philosophy is helpful;
- Communication of the strategic plan is a formal and significant element of the process;
- Strategic thinking should take place primarily at the business unit level.

Practical guides to strategic planning

The following online resources provide further insight into practical aspects of strategic planning. The Southern African Regional Universities Association, ([SARUA](#))⁵⁶ website provides very useful overviews of strategy and higher education in Southern Africa. The Queen’s University Science Shop has a “Practical Guide to Developing Policy and Strategy” at this [site](#)⁵⁷. Finally the Community Tool Box website has a [Tool Kit](#)⁵⁸ on “Developing Strategic and Action Plans” suitable for community organisations. The principles, however, are relevant to diverse organisational contexts.

Policy Development

Policies, as described above, are developed or amended to support and enable the strategic plan. They are used to guide or direct regular decision making within the organisation. Most institutions

⁵² <http://www.chet.org.za/books/strategic-planning>

⁵³ <http://www.chet.org.za/>

⁵⁴ <http://unesdoc.unesco.org/images/0018/001897/189759e.pdf>

⁵⁵ <http://trugroup.com/whitepapers/TRU-Strategic-Planning-best-practice.pdf>

⁵⁶ <http://www.sarua.org/>

⁵⁷ <http://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Library/Project reports/PERARES Practical guide to developing policy and strategy D7.1 Nov 2013.pdf>

⁵⁸ <http://ctb.ku.edu/en/developing-strategic-and-action-plans>

have a standard policy layout and approval process that will involve at least senior management and governance structures (Senate and/or Council).

Steps and key points to consider while developing a policy are:

- Do not embark on the policy development journey **without management backing**;
- Clearly record **why the policy is needed**, what decisions are to be made and how this will support the current strategy;
- Check for **existing policies** or those in similar and related areas of interest. Map these to be sure that the planned policy does not conflict with existing policy and, if necessary, amend or extend existing policy to deal with the issue in mind;
- Develop a **scope** of issues that the new policy will touch upon. Speak with experts in the field either within your institution or in similar external institutions to get considered inputs into drafting the policy. Beware of unintended consequences and always make sure that you have sufficient resources to implement the policy. Although policy may be desirable, if the institution does not have the resources to implement it, the policy should not be entered into the institution's statutes;
- **Consult, draft and revise**. This cycle may need to be repeated several times. Experience indicates that the development of contentious policy may take many months to complete, if not years;
- After all formal approvals have been given, **implement immediately**. It is important to implement the policy soon after approval process is completed, thus showing your intent and building confidence.

Further information on this process is available at this [website](#)⁵⁹ and at this [website](#)⁶⁰.

Project Management

No discussion of research planning (be it strategic or tactical) would be complete without a mention of the science of project management. Research, partially due to its external funding, is typically performed using a project mode. This implies that the research has a specific brief (a protocol or research plan with well-established quality parameters), a set budget (normally provided by the external funder) and a set timeline (required by the funder). These are the characteristic elements of a project and they need to be managed carefully to deliver a perfect project, meeting all three requirements, namely being 'on brief, on budget and on time'.

Plenty of online information is freely [available](#)⁶¹ about project management and project management courses abound. There are also a wide range of project management styles or theories including the [PMBok](#)⁶² (an acronym for Project Management Body of Knowledge that provides international standard terminology and guidelines), [PRINCE2](#)⁶³ (an acronym for PProjects IN Controlled Environments which is a process-based methodology), [Agile](#)⁶⁴ project management used primarily for software development.

⁵⁹ <http://www.dcc.ac.uk/sites/default/files/documents/publications/DCC-FiveStepsToDevelopingAnRDMpolicy.pdf>

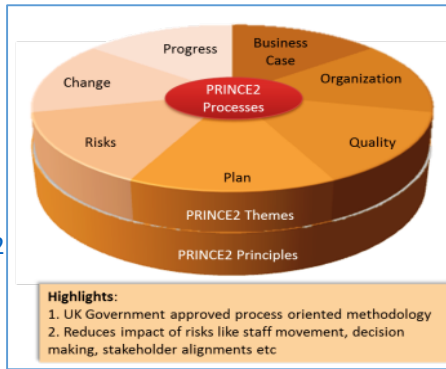
⁶⁰ <http://www.leoisaac.com/policy/top132.htm>

⁶¹ https://en.wikipedia.org/wiki/Project_management#Project_development_stages

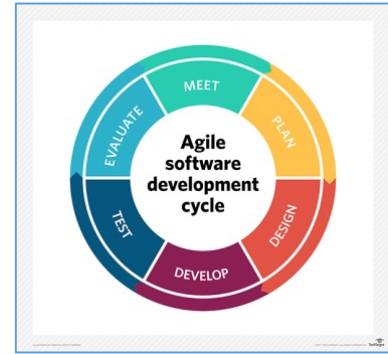
⁶² https://en.wikipedia.org/wiki/Project_Management_Body_of_Knowledge

⁶³ <https://en.wikipedia.org/wiki/PRINCE2>

⁶⁴ <http://searchsoftwarequality.techtarget.com/definition/agile-software-development>



Source: Prince2



Source: Agile

The risk that these project methodologies unintentionally introduce to a research projects is related to not completing tasks on time and according to schedule. This is because research is not like building a house, for example, where all the steps have been repeated over and over. Every research project is different and many uncertainties arise when working on the edge of our knowledge spending much time dipping into areas of ignorance. Time frames for research project activities are incredibly difficult to estimate and so it is important for the research manager to use project management approaches that adapt to this uncertainty.

Agile does offer some flexibility as it is arranged around being highly adaptive to rapid changes. Another research sensitive approach is offered by Carine Galli Marxer (Marxer, 2015). She has developed a project management cube consisting of six important activities that are described on her [website](#)⁶⁵ and paraphrased here:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Why? Consider benefits, stakeholders & systems • What? Consider objectives & deliverables • How? Consider work to be completed, schedules, costs, milestones, costs & risks | <ul style="list-style-type: none"> • Who? Consider team members, roles, communication plan • Act: Consider contracts, soft skills, kick off process & close out • Ok? Consider control, checking & solutions |
|--|--|

Another project management methodology that lends itself to research is the [PDCA](#)⁶⁶ approach. PDCA is an acronym for the **plan–do–check–act** cycle, also known as the Shewhart cycle. The steps include (i) plan a small element of work, (ii) implement this plan, (iii) check that it is yielding the right results, that is the project is moving in the right direction, (iv) depending on the outcome of the check step adjust the plan and repeat work or plan some more work and continue with the cycle. This ‘plan as you go’ method is ideal for the research project which ventures into the unknown.

In bringing this section on project management methodologies to a close, it is worth mentioning a comprehensive project management online resource that covers all aspects of project management including the latest articles and tools; namely [Project Smart](#)⁶⁷. It provides a wealth of information and resources to assist project managers at various levels to enhance their skills and performance. Even more importantly, it provides access to an array of management tools and techniques such as the:

- Delphi Technique a method for forecasting;
- Moscow Technique a prioritisation method; and

⁶⁵ <http://www.cubisma.ch/>

⁶⁶ <https://en.wikipedia.org/wiki/PDCA>

⁶⁷ <https://www.projectsmart.co.uk/tools.php>

- Pareto Principle, also known as the 80/20 rule or the law of the vital few. It states that, “for many events, roughly 80% of the effects come from 20% of the causes”.

Monitoring and Evaluation

Now that we have examined research planning at various levels from strategic to tactical, the question arises: are these plans working? Being able to monitor and evaluate progress of projects, policies and even strategies is a crucial part of good planning. Therefore, it is important for the research manager to understand the theory and basics of M&E (monitoring and evaluation).

The essence of this endeavour is to choose meaningful quantitative and qualitative indicators that truly reflect the progress of the plan towards the stated goal without itself impacting negatively on the plan in the course of the measurement. The evaluation [toolbox](#)⁶⁸ is a very useful resource in guiding one through the M&E framework. Other examples of M&E frameworks include the United National Development Framework, [UNDP](#)⁶⁹ and [UNICEF](#)⁷⁰ handbooks.

One example of M&E that has found a large degree of currency is the [Balanced Scorecard](#)⁷¹ (see p 6). Its architecture is comprehensive, measuring a wide array of organisational factors. Of particular importance, it can be simply modified to different organisational settings, including those present in a research organisation. It is claimed that its use, involving people in the process of deterring suggestions for improvement, is more important than the plan itself. This prompts thinking about how often and when researchers, academics and students are engaged with or in determining policy and relevant processes.

In a commercial organisation the balanced scorecard combines both financial and non-financial factors to measure company performance. Based on their experience, Robert Kaplan and David Norton (Kaplan & Norton, 2017), developed the approach around the idea that impressive financial returns are only one of the important factors to consider when assessing the success of a business. A balanced scorecard evaluation should take into account a range of objectives in different categories, including both leading and lagging indicators. A sample scorecard is provided in Table 3 below.

Metrics relevant to research can be added to the scorecard, for example research publications, patents, research funding, research uptake, major discoveries, spin-off companies, licences, impact, etc. Each of these metrics would include specific quantitative targets to help an organization measure its progress against established goals (e.g., increase research publications by 25%).

Table 3: The Balanced Scorecard

| Strategic Objectives | Strategic Measures |
|------------------------------|-----------------------------|
| Financial | |
| Improve returns | Return on investment |
| Broaden revenue mix | Revenue growth, revenue Mix |
| Reduce cost structure | Service cost change |
| Customer | |

⁶⁸ http://evaluationtoolbox.net.au/index.php?option=com_content&id=20

⁶⁹ <http://web.undp.org/evaluation/documents/HandBook/ME-Handbook.pdf>

⁷⁰ https://www.unicef.org/spanish/evaluation/files/PPP_excerpt_ch5.pdf

⁷¹ <http://trugroup.com/whitepapers/TRU-Strategic-Planning-best-practice.pdf>

| | |
|---|--|
| Increase satisfaction with our products and people | Share of Segment, Depth of Relationship |
| Increase after sale satisfaction | Customer retention, satisfaction survey |
| Internal | |
| Understand our customers | Customer satisfaction score |
| Create innovative products | New product revenue, product development cycle |
| Cross-sell products | Cross-sell ratio, hours with customers |
| Shift customers to cost-effective channels | Channel mix change |
| Minimize operational problems | Service error rate |
| Responsive service | Request for fulfilment time |
| Learning | |
| Develop strategic skills | Strategic job coverage ratio |
| Provide strategic information | Strategic information availability ratio |
| Align personal goals | Employee satisfaction, personal goals alignment, percentage revenue per employee |

Source: [Balanced Scorecard Institute](#)⁷²

Research Measurement Tools

M&E in a research context must include bibliometric and altmetric (alternative metric) indicators to be meaningful. The science of bibliometrics is an actively developing and growing field of research since its inception in 1955 thanks mainly to the contributions of [Eugene Eli Garfield](#)⁷³ (16 September 1925 – 26 February 2017). He helped create the Science Citation Index and thus began the process of counting citations as a measure of impact of peer reviewed publications. The more citations a paper gets the greater its impact and generally this is understood as a proxy indicator of its quality.

Out of the simple counting citations a range of other metrics grew including, at least, the journal Impact Factor (IF)⁷⁴, the [Eigenfactor](#)⁷⁵, SCImago Journal Rank ([SJR](#)⁷⁶) and the Source Normalized Impact per Paper ([SNIP](#)⁷⁷) score. The alternate to the journal IF, namely the h-index, developed by [Jorge Hirsch](#)⁷⁸, indicates primarily the quality of an author by measuring the ratio of the number of publications and the number of citations. These bibliometrics are discussed briefly in this excellent YouTube [video](#)⁷⁹.

Other useful resources to help the research manager learn more about research measurement through bibliometric data, for the purposes of M&E research plans are provided below.

- A PowerPoint [presentation](#)⁸⁰ by Tefko Saracevic of Rutgers University discussing the basics;
- A [paper](#)⁸¹ by Eric T. Meyer on the topic of “What are Bibliometrics and Scientometrics?”
- An [overview](#)⁸² of the laws of bibliometrics and other resources;

⁷² <http://www.balancedscorecard.org/BSC-Basics/About-the-Balanced-Scorecard>

⁷³ https://en.wikipedia.org/wiki/Eugene_Garfield

⁷⁴ https://en.wikipedia.org/wiki/Impact_factor

⁷⁵ <https://en.wikipedia.org/wiki/Eigenfactor>

⁷⁶ https://en.wikipedia.org/wiki/SCImago_Journal_Rank

⁷⁷ https://en.wikipedia.org/wiki/Journal_ranking#SNIP

⁷⁸ <https://en.wikipedia.org/wiki/H-index>

⁷⁹ <https://www.youtube.com/watch?v=Pmw9KKpuqFU>

⁸⁰ <http://cominfo.rutgers.edu/~tefko/Courses/610/Lectures/Bibliometrics.ppt>

⁸¹ <http://microsites.oii.ox.ac.uk/tidsr/kb/48/what-bibliometrics-and-scientometrics>

⁸² <https://www.ischool.utexas.edu/~palmquis/courses/biblio.html>

- A [document](#)⁸³ entitled “Bibliometrics and the World Wide Web” by Don Turnbull;
- Thomson Reuters’ (now Clarivate Analytics’) [guide](#)⁸⁴ on using bibliometric data, and a second [guide](#)⁸⁵ on the various data sets and their significance;

Altmetrics, on the other hand, are non-traditional metrics proposed as an alternative to more traditional citation impact metrics, such as the IF and h-index. “The term altmetrics was proposed in 2010, as a generalization of article level metrics, and has its roots in the **#altmetrics** hashtag” (Wikipedia, the free encyclopedia, 2017). A classification of altmetrics includes:

- **Viewed** - HTML views and PDF downloads;
- **Discussed** - journal comments, science blogs, Wikipedia, Twitter, Facebook and other social media;
- **Saved** - [Mendeley](#), [CiteULike](#) and other social bookmarks;
- **Cited** - citations in the scholarly literature, tracked by [Web of Science](#), [Scopus](#), [CrossRef](#) and others;
- **Recommended** - for example used by F1000Prime.

As with most other topics in Research Management the diversity of metrics can be overwhelming. It is therefore recommended that the reader investigate the so called [Snowball Metrics](#)⁸⁶ developed by a large consortium of universities to standardized research metrics in 2013 (The Sector for the Sector, 2013).

Before closing this section it is necessary to share a word of caution. Impact measures in the form of bibliometric or altmetric data have inherent risks and can be used inappropriately if not understood clearly. For example, while bibliometric data are about the journal, some research managers use them to help select or promote staff. Understanding the nature of the different measures and their purpose is important for research managers. Here are three websites that share some of these dangers or pitfalls.

- A Nature [review](#)⁸⁷ by Jonathan Adams entitled “Bibliometrics: The citation game”;
- An open access journal [article](#)⁸⁸ by Agarwal, et al., and entitled “Bibliometrics: tracking research impact by selecting the appropriate metrics”;
- An Edtage Insights [article](#)⁸⁹ by Sneha Kulkarni entitled “Misuse of bibliometric analysis shifts scientists' focus from their research to pursuing scores”.

Conclusion

Planning in the research context is important; be it at the organisation/administrative level or indeed for research projects. This chapter has briefly introduced the competencies of strategic planning (using a road map analogy), policy development (considering scope, layout and approvals) and M&E (including a brief discussion on bibliometrics and altmetrics). It also discussed various project management approaches that can be used to steer an organisation/administrative project or a research project to completion ‘on time, on budget and on brief’.

⁸³ <https://www.ischool.utexas.edu/~donturn/research/bibweb.html>

⁸⁴ http://ip-science.thomsonreuters.com/m/pdfs/325133_thomson.pdf

⁸⁵ http://wokinfo.com/media/mtrp/UsingBibliometricsinEval_WP.pdf

⁸⁶ <https://www.snowballmetrics.com/>

⁸⁷ <https://www.nature.com/articles/510470a>

⁸⁸ https://www.clevelandclinic.org/reproductiveresearchcenter/miscs/2016_Agarwal_Bibliometrics.pdf

⁸⁹ <https://www.editage.com/insights/misuse-of-bibliometric-analysis-shifts-scientists-focus-from-their-research-to-pursuing-scores>

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Further Resources

A number of examples of university strategic plans are presented below to demonstrate how the principles discussed above take on specific meanings within the context of the history, legacy, setting and trajectory of the institution:

| | |
|--|--|
| South African universities | |
| University of Kwa-Zulu Natal 2017 Strategic Plan ⁹⁰ | University of Fort Hare 2009 – 2016 Strategic Plan ⁹¹ |
| University of Johannesburg 2009 Strategic Plan ⁹² | |
| USA based universities: | |
| Cornel University 2010 - 2015 Strategic Plan ⁹³ | Wayne State University Strategic Plan ⁹⁴ |
| Washington State University 2014 – 2019 Strategic Plan ⁹⁵ | |
| A Canadian university | |
| University of Calgary 2012 Strategic Plan ⁹⁶ | |
| UK based universities | |
| University of Oxford 2013 – 2018 Strategic Plan ⁹⁷ | University of Bristol 2009 – 2016 Strategic Plan ⁹⁸ |
| Here are some examples of university research and other types of policies: | |
| North West University in South Africa: Policy List ⁹⁹ | Alberta University in Canada: Policy List ¹⁰⁰ |
| Stanford University in the USA: Policy List ¹⁰¹ | |

The following are links to websites that give more information about the five step project life cycle. They also provide a source of templates, visualisation tools and other online resources. [Method 123](#)¹⁰²; [Bright Hub Project Management](#)¹⁰³; [MPMM](#)¹⁰⁴ Method 123; (my preferred source) [Smartsheet](#)¹⁰⁵; [Projelogic](#)¹⁰⁶, [BC Open Textbooks](#)¹⁰⁷ Project Management and [Atlassian](#)¹⁰⁸.

Chapter 7: Researcher Development

Introduction

A critical challenge facing SADC countries and indeed countries across the world is the need to continually replace and grow their cohorts of highly skilled human resources needed to fulfil their research and innovation aspirations. Where will the next Nobel Laureate or Bill Gates come from? Unsurprisingly, the Research Management professional has an important catalytic role to play in this

⁹⁰ <https://www.ukzn.ac.za/about-ukzn/vision-and-mission/>

⁹¹ http://www.ufh.ac.za/files/Strategic%20Plan%202009_Final_Nov%202009.pdf

⁹² <https://www.uj.ac.za/research/Documents/Research%20Policy%20and%20Strategy.pdf>

⁹³ <https://www.cornell.edu/strategicplan/>

⁹⁴ <http://research.wayne.edu/about/planning.php>

⁹⁵ <http://www.cornell.edu/strategicplan/docs/060410-strategic-plan-final.pdf>

⁹⁶ <http://www.ucalgary.ca/research/files/research/strategicresearchplan2012.pdf>

⁹⁷ <https://www.ox.ac.uk/about/organisation/strategic-plan?wssl=1>

⁹⁸ <http://www.bristol.ac.uk/media-library/sites/research/migrated/documents/strategy.pdf>

⁹⁹ http://www.nwu.ac.za/content/policy_rules

¹⁰⁰ <http://www.abertay.ac.uk/discover/the-university/governance-and-management/freedom-of-information/management/>

¹⁰¹ <https://doresearch.stanford.edu/policies/research-policy-handbook>

¹⁰² <http://www.method123.com/project-lifecycle.php>

¹⁰³ <http://www.brighthubpm.com/monitoring-projects/1907-successfully-guide-your-projects-to-completion-with-the-pm-life-cycle/>

¹⁰⁴ <http://www.mppmm.com/project-management-methodology.php>

¹⁰⁵ <https://www.smartsheet.com/blog/demystifying-5-phases-project-management>

¹⁰⁶ <http://www.projelogic.com/steps.asp>

¹⁰⁷ <https://opentextbc.ca/projectmanagement/chapter/chapter-3-the-project-life-cycle-phases-project-management/>

¹⁰⁸ <https://www.atlassian.com/>

space of researcher development. They are called upon to continuously stimulate, enable, facilitate and sustain the career development of researchers and innovators.

This chapter discusses the generative, reproductive and catalytic capabilities required of Research Management in knowledge producing institutions. Researcher development is integrally linked to human resource development and so entails setting up appropriate structures, policies and strategies, often in conjunction with the HR department, to facilitate institutional reproductive capacity for research, development and innovation.

The Professional Competency Framework describes this key competency area as: *“Support postgraduate student and researcher development across the research pipeline within different organisational settings”*.

Researcher Development Strategies and Programmes

Training and development in the sense of continual education is a specialist field of education and not something to be undertaken lightly by the research manager. Nonetheless, it is entirely possible for the research manager to draw in professionally trained educators or highly experienced researchers to present a programme of knowledge transfer sessions that will develop research skills and prepare people for the rigours of the research career. The emphasis for the research manager therefore is on programme development, management and evaluation rather than on actual presentation.

The good news is that there are plenty of researcher development strategies, programmes and resources freely available on the Web, some of which will be discussed in the following pages. However, it is necessary to recognise that simply importing a development programme may not necessarily lead to success. Firstly, it is important to recognise that one’s circumstances – the type of research institution, its history and state of development, its current staff’s capacity and capability for research and the overall institutional strategy – will shape the ideal development programme. It will be necessary to establish the exact needs of researchers within the organisation, through some combination of survey and focus group investigation, before deciding on the shape of the development programme. It is also important to recognise that the development needs may well vary across the organisation requiring different interventions in different organisational places. Secondly, it is important to tune the training intervention to match the audience. The [National Institute of Health](#)¹⁰⁹ use five stages to describe their research workforce, but in most research institutions, and especially universities, the target audiences can be conveniently divided into three broad categories, namely:

1. The **next generation of researchers**, that is, postgraduate students enrolled for Master’s by research and PhD degrees. They are generally young (but not as young in Africa as they may be in Europe) and their interests are focused on developing their basic research skills, beginning to publish, graduating, and seeking a job.
2. **Early career researchers**, which typically include academic staff (contract or permanently appointed staff), some still working towards a PhD degree, but others that are recently past (perhaps up to five or six years past) the completion of their PhD degrees. Their interests are on how to make a career out of their research, how to integrate their research with their many other organisational roles, for example teaching, academic citizenship, and administration, and how to continue publishing (despite all these other demands).

¹⁰⁹ <https://researchtraining.nih.gov/>

3. **Established researchers**, that is, those who have more than six or seven years of research experience behind them, and who are looking to take their careers to the next level by developing a significant research reputation.

The review of online resources begins with the excellent services provided by [Vitae](https://www.vitae.ac.uk/)¹¹⁰ that covers all three target audiences. Vitae is a UK based organisation promoting professional and career development of doctoral researchers and staff in higher education institutions and research institutions across the world through the provision of training and events, such as the annual development conference. Membership to Vitae can be arranged at the organisational or individual level and gives access to additional resources and opportunities. It provides many development services, but at its heart is the [Researcher Development Framework](https://www.vitae.ac.uk/vitae-publications/rdf-related/researcher-development-framework-rdf-vitae.pdf/view)¹¹¹ that consists of four domains: (i) knowledge and intellectual abilities, (ii) professional effectiveness, (iii) research governance and organisation, and (iv) engagement, influence and impact. A detailed explanatory PowerPoint can be downloaded from this [site](http://www.rin.ac.uk/system/files/attachments/Regional_wshop_14-02-11_-_RDF_intro.ppt)¹¹² with further documentation available on the Vitae webpage referenced above.

Considering the available online support for each of the three target audiences individually; we begin with the **next generation researchers**. They are interested in honing their research skills, learning how to communicate their research findings, completing their degrees speedily and finding suitable postdoctoral positions. The second edition, updated in 2012, of the Johnson classic entitled “Charting a course for a successful research career” (Johnson, 2012)¹¹³ is very helpful in these circumstances. It gives useful advice on • Career Planning • Selecting a Research Discipline Area • Selecting a Supervisor • Selecting a Mentor • Research Collaboration • Networking • Ethics and Research Integrity • Choosing Your Publication’s Style and Format • Where to Publish • Preparing a Grant Funding Application • Collaborating with Industry and Academia • Attending Conferences • Society Membership • Selling Your Accomplishments • Curriculum Vitae • Applying for Fellowships • Applying for a Job or Promotion.

The University of Kent’s (social sciences) Graduate School provides a [Researcher Development Programme](https://www.kent.ac.uk/graduateschool/skills/programmes/RDP%20handbook%202015.pdf)¹¹⁴ for such postgraduate research students. Their programme is unsurprisingly methodology heavy: for example, it covers topics such as qualitative research methodologies, fundamentals of statistics, scientific writing, preparing for your viva. However, the programme also has elements suitable for the early career academic group, for example, writing an article for international publication, research ethics, team building, time and stress management, and writing a useful CV.

Early Career Researchers will want to focus on establishing themselves as independent researchers, developing a research niche and recruiting good students. In the book entitled “The Science Magpie: A Miscellany of Paradoxes, Explications, Lists, Lives and Ephemera from the Wonderful World of Science” by Simon Flynn (Flynn, 2012) (p 248), Paul Ehrlich, as quoted in M. Perutz, 'Rita and the Four Gs', Nature, 332, 791 (1988), says that early career researchers need is “Glück, Geduld, Geschick und Geld”. These ‘4 Gs’ can be loosely translated to (i) luck – in the sense of being prepared to take opportunities when they arises most often unexpectedly, (ii) patience – in the sense of planning one’s time carefully as it is often the most precious and limited of resources, (iii)

¹¹⁰ <https://www.vitae.ac.uk/>

¹¹¹ <https://www.vitae.ac.uk/vitae-publications/rdf-related/researcher-development-framework-rdf-vitae.pdf/view>

¹¹² http://www.rin.ac.uk/system/files/attachments/Regional_wshop_14-02-11_-_RDF_intro.ppt

¹¹³ <http://www.rmsinternational.com/documents/developing-a-research-career/English.pdf>

¹¹⁴ <https://www.kent.ac.uk/graduateschool/skills/programmes/RDP%20handbook%202015.pdf>

skill – in the sense of knowing the peripheral skills one needs to be a successful researcher, and (iv) money – securing grants that drive most research campaigns.

An example of a specific programme for Early Career researchers is described in this downloadable [document](#)¹¹⁵.

Established researchers aspire to take their careers to the next level by learning how to lead a research team, develop and nurture an international research reputation and securing large collaborative research grants. For this group the University of Aberdeen's management skills [handbook](#)¹¹⁶. The handbook covers topics such as how to lead and manage research projects, manage a research team to deliver projects, secure new research grants, liaise with stakeholders, manage research outputs (publications), respond to institutional issues and agendas and teaching and administrative duties.

The following resource specifically focuses on the challenge of capacity building in **research leadership** in Africa. It was published by the Partnership for African Social & Governance Research, based in Nairobi, Kenya. The [report](#)¹¹⁷ spells out the objectives: (i) to define what research leadership means in the African context, (ii) to identify the attributes and competencies of research leadership, (iii) to identify research leadership development opportunities available in Africa, and (iv) to suggest guidelines for research leadership capacity-building efforts. The survey results showed that the top five qualities of research leadership in Africa included: (i) communication skills, (ii) delivering outputs on time, (iii) time management skills, (iv) competency in leadership, and (v) good vision and strategic thinking. The focus group discussions revealed similar important attributes, namely: (i) effective communication skills to present projects to external constituencies and to facilitate internal communication among research team members, (ii) research leaders should not see themselves as the boss, but as part of a team, (iii) team-building skills and social qualities to lead and manage a team socially and technically, and (iv) financial competencies to deal with budget issues related to research projects.

The World Health Organisation has developed a comprehensive research capacity development [strategy](#)¹¹⁸ for low- and middle-income countries. This strategy is an example of a targeted approach which focuses on research capacity to address health problems in these countries. They aim to:

- Analyse gaps and needs for agenda setting in research and capacity building
- Facilitate translation of evidence into action
- Strengthen capacity to conduct high quality interdisciplinary priority research needs
- Promote leadership in health research
- Foster harmonization and alignment of efforts for global health research and goals
- Engage with key stakeholders around research and capacity needs.

Their guiding principles are:

| TDR | promotes the values of being |
|-----|---|
| E | Effective and equitable in responding to needs and accessible to all |
| Q | Quality assured in promoting excellence, innovation and best practices |
| U | Useful in function, bringing practical solutions to priorities |
| A | Aligned with priorities and needs, adapted to developing countries' settings and values |
| L | Linked with partners for synergies and interdisciplinary competencies |

¹¹⁵ http://remat.tutech.eu/wp-content/uploads/2014/12/ReMaT_FinalReport2009.pdf

¹¹⁶ <http://www.abdn.ac.uk/develop/managers/>

¹¹⁷ http://www.pasgr.org/wp-content/uploads/2016/05/PASGR-Research-Leadership-Commissioned-Study_Mar-25.pdf

¹¹⁸ <http://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0004631>

Source: WHO

Many research development resources are available at various Australian, UK and USA university websites; four chosen more or less at random include [University of Queensland](https://researcher-development.uq.edu.au/)¹¹⁹ in Australia, [University of Manchester](https://www.manchester.ac.uk/research/researcher-development/)¹²⁰ and [UCL](http://www.ucl.ac.uk/hr/od/research/)¹²¹ in the UK, and [Yale University](https://your.yale.edu/work-yale/career-development)¹²² in the USA. But perhaps more important are the active researcher development programmes in Africa. Many of these have disciplinary foci which may match your institution's strategic focus; if not much still can be learnt from these successful programmes.

- The Consortium for Advanced Research Training in Africa ([CARTA](http://cartafrica.org/))¹²³. Their vision is to be a “catalyst for the emergence of a vibrant African academy able to lead world-class multidisciplinary research that makes a positive impact on population and public health”. It is a “south-south partnership with a south-north collaboration jointly led by the African Population and Health Research Center (APHRC), Kenya, and the University of Witwatersrand (Wits), South Africa”. “The consortium is built on a merit driven system that ensures transparency and accountability to its members. It was formed with a mandate of establishing a vibrant African academy able to lead world-class multidisciplinary research that impacts on population and health”. “CARTA was formed in 2008 out of the realization that individual African universities lack the human and financial resources and infrastructural capacity to tackle the challenges of doctoral training on the continent”. Figure 6 below illustrates the CARTA strategy for successful researcher development.
- Consortium of International Agricultural Research Centers ([CGIAR](http://www.cgiar.org/))¹²⁴. “Science for a food secure future” is their slogan which brings together agricultural research for the benefit of people across the globe, including in Africa, especially where food security is in question. Their vision is a “world free of poverty, hunger and environmental degradation.” They have ambitious targets for 2030: their research will “result in 150 million fewer hungry people, 100 million fewer poor people – at least 50% of who are women and 190 million HA less degraded land”. Their strategic commitment to capacity development is described in this [document](https://cgspace.cgiar.org/bitstream/handle/10947/3414/CGIAR%20Capacity%20Development%20Framework%20Working%20Draft.pdf?sequence=4)¹²⁵. The example provides insights into developing strategies for institutionalising research capacity development, strengthening gender sensitivity approaches and setting up monitoring and evaluation frameworks and indicators to ensure the effectiveness and benefits of capacity development programmes. Of great importance in the development of researchers is strengthening gender sensitivity in research capacity development, for more information visit this [webpage](http://gender.cgiar.org/)¹²⁶.

¹¹⁹ <https://researcher-development.uq.edu.au/>

¹²⁰ <https://www.manchester.ac.uk/research/researcher-development/>

¹²¹ <http://www.ucl.ac.uk/hr/od/research/>

¹²² <https://your.yale.edu/work-yale/career-development>

¹²³ <http://cartafrica.org/>

¹²⁴ <http://www.cgiar.org/>

¹²⁵ <https://cgspace.cgiar.org/bitstream/handle/10947/3414/CGIAR%20Capacity%20Development%20Framework%20Working%20Draft.pdf?sequence=4>

¹²⁶ <http://gender.cgiar.org/>

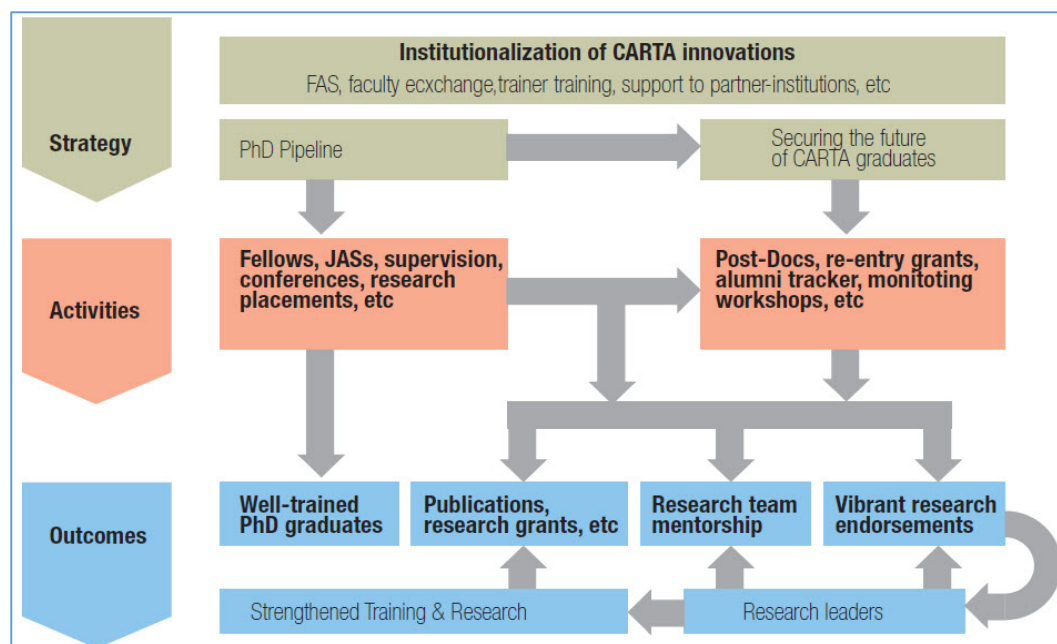


Figure 6: The CARTA strategy for successful researcher development

Research into Research Capacity Development

The literature is fairly rich with studies of researcher development programmes. Reading these will give insight on the development of the ideal programme to fit your current context and even more valuable, it will guide you in the monitoring and evaluation of the programmes you establish.

1. **UWC and North-South Collaboration:** We begin with a study by JM Franz, et al (Frantz, et al., 2014), who investigate research capacity development at University of the Western Cape, South Africa, through a north-south collaboration. "Through this north-south collaboration, members of the collaboration were able to develop intra- and inter-disciplinary partnerships that resulted in maximising the capacity-building efforts. The exposure to this collaboration improved both individual and institutional research capacity in the south."

This thorough study followed the [UNDP](http://www.undp.org/)¹²⁷ 2007 capacity development strategy that includes these steps: (i) engage partners and build consensus, (ii) assess capacity assets and needs, (iii) define capacity development strategies, and (iv) implement capacity development strategies monitor and evaluate capacity development strategies. Step two revealed an interesting array of staff needs, probably not uncommon to most developing research institutions, and their selected strategies to address them, as illustrated in Table 4.

Table 4: Developmental needs and simply strategies to realise these needs

| Needs | Strategies |
|----------------------|--|
| Capacity Development | Postgraduate qualifications for staff |
| | Staff relief |
| | Postgraduate qualifications for students |
| | Scholarships |
| | Enhanced research productivity |
| | Writing retreats for publication |
| | Skills training |

¹²⁷ <http://www.undp.org/>

| | | |
|-----------------------------|---|---|
| | | Special editions Conference presentations Conference organization |
| | Networking and collaboration | North-south staff exchange |
| | Niche area development | Centres of excellence |
| | Supervision skills and capacity | Co-supervision |
| Skills Development | Training | Short courses Curriculum development – master’s programme |
| | | |
| Resource Development | Exposure to and quality resources and research infrastructure | Staff and student exchanges |
| | Acquisition of quality resources and research infrastructure | Funding |

Source: [Research Capacity Development in an SA HEI through a north-south collaboration](#)¹²⁸

The results of this ten year experiment included 21 higher degrees, ten academic qualifications attained by staff, and 34 publications in national (n = 11) and international (n = 23) journals. Six theses completed in partial or total fulfilment of higher degree requirements were also converted into publications. Three conferences were organised which provided opportunities for networking with local and international scholars. In addition, three niche areas and two centres of excellence were developed.

2. **Another north-south developmental collaboration:** The South Africa–Netherlands Research Programme on Alternatives in Development (SANPAD), a doctoral research preparation programme for candidates on the African continent, evolved from an aid programme to an exemplary model of innovation, namely [SANTRUST](#)¹²⁹, an ownership-driven partnership within the framework of internationalization. “This model of innovation includes a programme with a novel approach to focus on redress in South Africa, particularly for Black women researchers. The research design for this inquiry used an intrinsic case study, with interviews, observations and document analysis as data collection strategies. The case study revealed how SANTRUST, the innovation model, which is now the fully-fledged South-owned programme, sustained the SANPAD aid programme. The key finding revealed that SANTRUST in its relationship with research universities has matured into an example of sustainable national and international cooperation within a knowledge network paradigm”. While the programme has ended, there are publications available that record the models used for developing scholarly competence, through methodology in preparation for the PhD proper.
3. **A value chain approach to capacity development:** Lise Andreasen and colleagues (Andreasen, et al., 2014) make the point that a “value chain approach” can be used in research capacity development with reference to innovation and capacity building through research for innovation. They indicate that in the research and capacity building project “ProGrOV” 9 PhD and 6 MSc studies – at Makerere University in Uganda, University of Nairobi in Kenya and Sokoine University of Agriculture in Tanzania – are “addressing farm level production and market integration. The overall aim of ProGrOV is to strengthen research based knowledge for supporting increased productivity and sustainable growth in organic production and value chains ...”

¹²⁸ https://repository.uwc.ac.za/bitstream/handle/10566/2250/Frantz_Research%20capacity_2014.pdf?sequence=1&isAllowed=y

¹²⁹ <http://www.tandfonline.com/doi/abs/10.1080/03075079.2013.773218>

4. A second value chain approach is described at this [website](#)¹³⁰. This study of research conducted in Ethiopia indicates that graduate programmes which tend to be closely linked to applied research tend to be stronger in their disciplinary focus. But capacity building needs to be extended into building capacity of multi and inter-disciplinary teams to derive the full potential and benefit of capacity building.

The PhD and Entrepreneurship

In bringing this chapter to a close it is worth considering briefly how a PhD may help people get a job or better still create a job; given high unemployment, poverty and inequality in low- and middle-income countries where society may often question the value of the PhD. This is an interesting question, given that the nature of the PhD is often focused on a contribution to knowledge with a traditional emphasis on fundamental knowledge – ‘an academic study’. The implication is that some see it as so separated from the real world that its value is not immediately clear. The following websites are discussions and reflections on the value and benefit of the PhD often lead by young PhD graduates and are shared to dispel the erroneous notion that the PhD does not help in equipping people for a life of entrepreneurship.

- [“The Professor Is In: The Essential Guide to Turning Your Ph.D. Into a Job”](#)¹³¹
- [“What do a PhD scholar and an entrepreneur have in common?”](#)¹³²
- [“Is it worth it for someone planning to be an entrepreneur to get a PhD?”](#)¹³³
- [“A Ph.D.’s Path to Entrepreneurship”](#)¹³⁴
- [“How my PhD unexpectedly carried over to entrepreneurship”](#)¹³⁵

From the perspective of Research Management, the question would be how could the Research Office support initiatives and efforts to enhance the innovation, commercialisation and entrepreneurship potential of PhDs and whether this should be included as part of capacity building and thinking about postgraduate study and post PhD life and work expectations.

Conclusion

The research manager is often called upon to establish and implement a researcher development strategy with its associated programme of activities. Although there are plenty of resources available, it is important to tailor them for the institution and the audience. Audiences consist of the next generation, early career and established researchers, each requiring different types of support. Finally, we saw that the PhD does not only prepare people for an academic or research focused career, indeed it can be a stepping stone into the world of the entrepreneur.

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Further Resources

The following resources are free and downloadable and give in depth insight into the creation of researcher development programmes.

¹³⁰ <https://www.researchgate.net/publication/304771779> Linking graduate research to development Opportunities and challenges for value-chain oriented graduate training and research in Ethiopia

¹³¹ <http://theprofessorisin.com/buy-the-book/>

¹³² <https://yourstory.com/2014/04/phd-scholar-entrepreneur/>

¹³³ <https://www.quora.com/Is-it-worth-it-for-someone-planning-to-be-an-entrepreneur-to-get-a-PhD>

¹³⁴ <https://chroniclevitae.com/news/331-a-ph-d-s-path-to-entrepreneurship>

¹³⁵ <https://alexshye.com/2012/10/17/how-my-phd-unexpectedly-carried-over-to-entrepreneurship/>

Capacity building programmes at research institutes

The following provides a list of links to various kinds of capacity building programmes at universities and across the SADC region. This provides an indication of the kinds of capacity building available and is an indication of institutional development, regional development and focus with reference to research. The programmes offered within the region tend to be focused on capacity building within specific areas of specialisation.

- African Economic Research Consortium, established in 1988, is a premier [capacity building institution](#)¹³⁶ in the advancement of research and training to inform economic policies in sub-Saharan Africa.
- Strengthening Capacity for Agricultural Research and Development in Africa (SCARDA) case study on institutional change of the National Agricultural Research System in [Lesotho](#)¹³⁷.
- The KEMRI/Wellcome Trust Research Programme was formed in 1989 when the Kenya Medical Research Institute formed a partnership with the Wellcome Trust and the University of Oxford. Research Capacity in Africa remains very low in part due to the failure of many capacity building initiatives to address long term sustainability. Emphasis is often laid on training alone without regard to the full career path needed to generate research leaders. KEMRI – Wellcome Trust [Research Programme](#)¹³⁸ has therefore developed a framework for the long-term development of local research leadership.
- The Irish-African Partnership for Research Capacity Building ([IAPRCB](#))¹³⁹
- United Nations University, Institute for the Advanced Study of Sustainability: [Japan's contribution to Capacity Building of Agricultural researchers in Africa](#).¹⁴⁰
- [Improving food security in West and East Africa through capacity building in research and information dissemination](#)¹⁴¹, "Food Africa"; Embassy of Finland, Nairobi

Capacity building programmes at universities

The following provides a list of links to various university based capacity building programmes.

- [University of Nairobi](#)¹⁴²
- [University of Botswana](#)¹⁴³
- [Makerere University](#)¹⁴⁴ and a Swedish partnership in capacity development
- [Durban University of Technology](#)¹⁴⁵
- [Vaal University of Technology](#)¹⁴⁶

¹³⁶ <http://www.aercafrica.org/>

¹³⁷ <http://faraafrica.org/wp-content/uploads/2015/04/Lesotho-case-study-final-draft-29-Aug-2011.pdf>

¹³⁸ <http://kemri-wellcome.org/capacity-strengthening/>

¹³⁹ <http://universitiesireland.ie/the-irish-african-partnership-for-research-capacity-building-iaprcb/>

¹⁴⁰ <https://ias.unu.edu/en/events/archive/side-event/japans-contribution-to-capacity-building-of-agricultural-researchers-in-africa.html#overview>

¹⁴¹ <http://www.finland.or.ke/public/default.aspx?nodeid=46424&contentlan=2&culture=en-US>

¹⁴² <https://implementationscience.biomedcentral.com/articles/10.1186/s13012-016-0395-5>

¹⁴³ <http://www.ub.bw/content/id/1958/pid/1800/ac/1/fac/8/Research-Capacity-Development/>

¹⁴⁴ <https://sida.mak.ac.ug/>

¹⁴⁵ http://www.dut.ac.za/research/research_capacity_development/

¹⁴⁶ <http://www.vut-research.ac.za/research-capacity-development/>

- [Stellenbosch University](#)¹⁴⁷

Capacity building programmes arranged by Associations

The following provides a list of links to capacity building programmes in Africa organised by different Associations.

- [SARIMA](#)¹⁴⁸
- [SARUA](#)¹⁴⁹

¹⁴⁷ <http://www.sun.ac.za/english/faculty/healthsciences/rdsd/Pages/Capacity-and-Funding.aspx>

¹⁴⁸ <http://www.sarima.co.za/africa-engagement-vice-president/>

¹⁴⁹ http://www.sarua.org/files/publications/RDFund/SARU_RD%20Fund_May%202011%20Ver%201.pdf

Chapter 8: Partnerships and Collaboration

Introduction

It is well understood that research benefits from collaboration, mainly in terms of quality, but also in terms of capacity development (Lamberts, 2013) (Zepeda, 2007). This chapter discusses the various considerations of the initiation, maintenance and development of partnerships and collaborations. It takes into account the different kinds of co-operative relationships and how they support the research agenda and the role players with whom partnership and collaborative relations are developed. It also gives consideration of the legal agreements needed to manage partnerships and collaborations, and the necessity for special organisational arrangements.

The Professional Competency Framework describes this competency area as follows: to “*facilitate and manage national, regional, international partnerships and collaborations to advance research including with research organisations, funders, industry, government and society*”.

What do Partnerships and Collaboration Entail?

Let us begin by confirming that the words ‘partnership’ and ‘collaboration’ are used in this module of the Handbook to mean largely the same thing, namely they describe co-operative work involving more than one party to achieve pre-agreed and common research goals. The partnership status will be used to indicate a wider agreement involving co-operation at the faculty¹⁵⁰ or university level and in relation to multiple research projects involving multiple contributors, probably from different countries. The term collaboration will be used to indicate a more isolated concept of co-operation between individual researchers on a single or small number of research projects from within one university or possibly more than one. The essence of both, however, is the sharing of costs, resources and work in order to achieve pre-agreed and common research goals. Often co-supervision of postgraduate students lies at the heart of most collaborative research projects.

Reasons to form research partnerships or collaborations would include increasing access to (i) financial resources, (ii) human resources, (iii) research subjects/data, (iv) facilities/utilities, (v) background and specialised knowledge, and/or (vi) critical mass. These benefits are discussed briefly below relying on two sources for insight: firstly the document entitled “Effective Community Collaboration” (National Coalition for Homeless Veterans, n.d.), which provides general information, and, secondly, the Committee on Institutional Cooperation’s report on inter-university co-operation in the USA (Zepeda, 2007) for research specific information.

1. In the research world financial resources usually refer to external funding. Increasingly funders require universities to form consortia to address cross-regional research questions or research projects that require combined resources to fulfil. Thus partnerships and collaborations are often driven by funding agencies, but in a developmental sense a partnership could lead to financial benefits for a smaller, less developed university partnering with a larger well-endowed university.
2. Human resource sharing can happen on many levels: the academic level to increase postgraduate supervision capacity and/or secure unique academic expertise needed for a specific research project (for example, the services of a bio-statistician), or at the student level where access to postgraduate students is enabled, or finally at the professional level where, for example, Research Management capacity could be shared.

¹⁵⁰ As in multiple schools or departments

3. Sharing research subjects (that is human, animal or physical subjects – e.g., access to natural phenomenon, geographic advantages, unique communities, rare sample collections, cohort studies, etc.) and/or data collected previously often enable research projects.
4. Facilities and/or utilities would include research equipment, e.g., a synchrotron that is vital for project execution but is not available to all because of excessive cost or lack of skilled operators, enable research projects.
5. Background or specialised knowledge shared can enable a new research projects that would simply not get off the ground without the collaboration. Much of the multi-disciplinary research gets done through such collaborations.
6. Critical mass, a somewhat vague term, which indicates that a planned project is better pursued by a consortium rather than an individual. It includes concepts of avoiding duplication and/or ensuring sufficient capacity of whatever the limiting resource is to ensure that the project is completed.

[Here](#)¹⁵¹ is an example of an international clinical research collaboration that introduces two important concepts: (i) active management needed for large (i.e., many contributing members) and complex (i.e., many types of institutions in many different countries) partnerships and (ii) diplomacy. Research Management professionals are cautioned that seldom can a Research Office take on the additional work of managing a large and complex partnership without running into trouble due to a lack of capacity. These partnerships require dedicated and committed management and administrative resources. The concept of diplomacy, the importance of which cannot be overemphasised in multi-cultural partnerships, is vital for sustaining complex partnerships. The problem is to find ‘partnership managers’ with the necessary skill and knowledge of diplomacy. One useful tip here is to consider asking for training support from the university’s International Relations academic department (if one exists) or to approach an embassy and ask them for assistance.

Depending on the quantity of the collaborative work special institutional arrangements may be needed. This might involve setting up a special division to support and manage partnerships and collaborations, such as the [Office of International Education](#)¹⁵² at Nelson Mandela University or the [Strategic Partnerships Office](#)¹⁵³ at Wits. It is important to note though that both of these organisations form part of the universities’ Research Offices.

While on the topic of large and complex partnerships it is worth noting that co-operation can also happen at a level above a partnership. **Alliances** of large numbers of universities focused on general co-operation and not necessarily built around specific projects, although they are hoped to yield specific research projects, abound in the global higher education scene. Consider the following four examples.

1. In the USA: the Committee on Institutional Cooperation, or the so called [Big Ten Conference](#)¹⁵⁴ consisting of:
 - i. Indiana University
 - ii. University of Illinois at Urbana-Champaign
 - iii. Michigan State University
 - iv. University of Iowa
 - v. Northwestern University
 - vi. University of Maryland
 - vii. Ohio State University
 - viii. University of Michigan
 - ix. Pennsylvania State University
 - x. University of Minnesota

¹⁵¹ <https://www.omicsonline.org/open-access/international-collaborative-research-partnerships-blending-science-with-management-and-diplomacy-2155-6113.1000385.php?aid=36025>

¹⁵² <http://research.mandela.ac.za/>

¹⁵³ <https://www.wits.ac.za/research/strategic-partnerships/>

¹⁵⁴ https://en.wikipedia.org/wiki/Big_Ten_Academic_Alliance

- | | |
|--------------------------|--------------------------------------|
| xi. Purdue University | xii. University of Nebraska–Lincoln |
| xiii. Rutgers University | xiv. University of Wisconsin–Madison |
2. In the UK: the [Russell Group](#)¹⁵⁵ of universities consisting of:
- | | |
|------------------------------|-----------------------------|
| i. University of Birmingham | ii. University of Bristol |
| iii. University of Cambridge | iv. Cardiff University |
| v. Durham University | vi. University of Edinburgh |
| vii. University of Exeter | viii. University of Glasgow |
3. In Australia: the [Group of Eight](#)¹⁵⁶ universities consisting of:
- | | |
|----------------------------------|--|
| i. University of Adelaide | ii. The Australian National University |
| iii. University of Melbourne | iv. Monash University |
| v. University of New South Wales | vi. University of Queensland |
| vii. University of Sydney | viii. University of Western Australia |
4. In Africa: the newly formed African Research University Alliance ([ARUA](#))¹⁵⁷ consisting of:
- | | |
|-------------------------------------|---------------------------------|
| i. University of Addis Ababa | ii. University of Dar es Salaam |
| iii. University of Ghana | iv. University Ibadan |
| v. Makerere University | vi. University of Nairobi |
| vii. Obafemi Awolowo University | viii. Rhodes University |
| ix. University of Rwanda | x. Stellenbosch University |
| xi. Cheikh Anta Diop University | xii. University of Cape Town |
| xiii. University of KwaZulu-Natal | xiv. University of Pretoria |
| xv. University of the Witwatersrand | |

For more insight into “Collaborative Approaches to Research” (the title of a Higher Education Funding Council of England commissioned review), it is worth reading this [report](#)¹⁵⁸. The study is comprehensive and contributes to deepening understanding of individual and institutional approaches to collaborative research with particular reference to the relationship between collaboration and the mission of higher education institutions. The report provides a detailed engagement of the notion of collaboration, the experience and case studies of collaboration, approaches to collaboration and ways in which collaboration can be improved.

Building Partnerships and Collaboration across Disciplines and with Industry

Partnerships and collaboration is not of course limited to universities. Universities often seek to partner with industry and vice versa. This European Association of Universities (EAU) [report](#)¹⁵⁹ published in 2014 discusses university-industry partnerships in detail. Furthermore, this University of Griffith 2002 [report](#)¹⁶⁰ picks up on some of the challenges and introduces the notion of risk management in university-industry partnerships. Trust building is regarded as very important and therefore is something that research managers need to be aware of.

The South African Department of Trade and Industry invests in a funding programme called the Technology and Human Resources for Industry Programme ([THRIP](#))¹⁶¹ which aims to support technology rich industry through promoting research collaboration with local universities and the

¹⁵⁵ https://en.wikipedia.org/wiki/Russell_Group

¹⁵⁶ [https://en.wikipedia.org/wiki/Group_of_Eight_\(Australian_universities\)](https://en.wikipedia.org/wiki/Group_of_Eight_(Australian_universities))

¹⁵⁷ <http://arua.org.za/>

¹⁵⁸ <http://users.sussex.ac.uk/~sylvank/pubs/colic.pdf>

¹⁵⁹ http://eua.be/Libraries/publications-homepage-list/EUA_EUIMA_Publication_web.pdf?sfvrsn=2

¹⁶⁰ https://research-repository.griffith.edu.au/bitstream/handle/10072/1591/19962_1.pdf;sequence=1

¹⁶¹ https://www.thedti.gov.za/financial_assistance/THRIP.jsp

exchange of skilled people. It was an extremely successful funding programme giving practical support and financial encouragement to cement university-industry relations, which can be difficult. The obstacle to harmonious relationships often arises from the opposing rhythms of the two types of organisation: industry being driven by profit and competition needs rapid results and when they are forthcoming wants to move onto the next problem; universities on the other hand train students who register in February each year, have orientation, spend time in the library, attend lectures and then have time for research, and once they get their teeth into an interesting problem they never want to let it go. It is the responsibility of Research Management to try to harmonise these rhythms as far as possible. Unfortunately, THRIP recently changed its operating mode significantly and the jury is still out on its continued efficacy.

Guidance from the Science|Business Innovation Board (a European organisation) (Edmondson, 2012)¹⁶² indicates that “universities and industry have been collaborating for over a century, but the rise of a global knowledge economy has intensified the need for strategic partnerships that go beyond the traditional funding of discrete research projects”. The author goes on to say that “it’s a big leap” that call upon both parties to engage far beyond the conventional exchange of research for funding. “When they work well, strategic partnerships merge the discovery-driven culture of the university with the innovation-driven environment of the company”. But to make the chemistry work, “each side must overcome the cultural and communications divide that tends to impair industry-university partnerships of all types and undercut their potential.”

Multi-disciplinary research arises by definition from collaboration. Given the existing complexities of quality research, multi-disciplinary research adds an additional layer of complexity. Confusion can arise from factors such as the (i) use of disciplinary specific language with different definitions of commonly used concepts, (ii) varying research methodologies, (iii) which discipline should the postgraduate students be drawn from to work on the multi-disciplinary project? and (iv) where should the research results be published? If these factors are not discussed and agreed upon before the collaborative project is initiated, problems will rear their ugly heads often requiring Research Management to help sort out the confusion. The good news according to this [paper](#)¹⁶³, is that the “benefits reported by practitioners were suggested to far outweigh the challenges associated with the approach”. What this points to is the importance of working closely with the nature of evolving collaborate processes and enabling the realisation of positive goal accomplishment.

Role of Research Management in Partnerships and Collaborations

Besides the pointers given above, Research Management should consider carefully how it can facilitate and support research collaboration because it offers the potential to increase research funding. The Zepeda report (Zepeda, 2007) considers this trend and highlights benefits, opportunities and considerations of enabling collaborative research. A further important dimension of collaboration is capacity building, which again is something Research Management should be interested in promoting. This [study](#)¹⁶⁴ considers how capacity building can be achieved through partnerships.

The study discusses the role of research management within a large scale complex project and indicates the important dimension of project management skills and communication skills in ensuring

¹⁶² <http://sciencebusiness.net/sites/default/files/archive/Assets/94fe6d15-5432-4cf9-a656-633248e63541.pdf>

¹⁶³ <https://iims.uthscsa.edu/sites/iims/files/Relationships-4.pdf>

¹⁶⁴ <https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-016-0132-1>

the coherence in the process and delivery of the project. The aim of this [paper](#)¹⁶⁵ is to “discuss the strategies that have been followed during the RN4CAST study, the largest nursing multi-country research project ever conducted in Europe”.

A major role for the research manager is to oversee the **contractual arrangements** that underpin the partnerships and collaboration. Although trust and diplomacy are important the need for contractual agreements cannot be overemphasised. A guideline on developing a Memorandum of Understanding (MoU), the starting point for most partnerships before they become binding legal agreements, can be down loaded from this [website](#)¹⁶⁶. Furthermore, Imperial College London’s [website](#)¹⁶⁷ has a good database of standard agreements which can be adapted to suite the current context. However, it may not be necessary for the research manager to write such agreements, if he or she has access to a well-informed lawyer, sensitive to the research process, who can do this on behalf of the Research Office.

Another role for the research manager is to **maintain a database of active collaborations** on behalf of the institution: consider this visual [example](#)¹⁶⁸. The database can be used to renew agreements before they lapse, keep track of outcomes of existing collaborations and where necessary trigger actions to improve the value of existing partnerships and collaborations. The European Commission [provides](#)¹⁶⁹ insights into the experience of research institutions building collaborative relations with industry across Europe and how such collaborations can be improved.

Building Partnerships and Collaboration with Communities

Another aspect of research collaboration is the need for universities to build relationships with various communities, either for the purposes of furthering the research or for providing a channel for engagement to effect research findings. These relationships are overlooked at one’s peril. Thus, the research manager is encouraged to consider this [academic-community roadmap](#)¹⁷⁰ that enables sustained partnership development. The University of Utah provides [guidelines](#)¹⁷¹ on how to develop partnerships for universities with their neighbourhoods. And in closing the [MRC/Wits Rural Public Health and Health Transitions Research Unit](#)¹⁷² (School of Public Health in Wits) is an example of the dependency of research on community co-operation. This unit operates the Agincourt Health and Socio-demographic Surveillance system which undertakes an annual census spanning 31 villages, 21 000 households and 110 000 people in southern Bushbuckridge (since 1992). None of this would be possible without the full participation and co-operation of the community.

Conclusion

Partnerships and collaborations describe co-operative work involving multiple parties aimed at achieving pre-agreed and common research goals. The driving force for establishing them is to increase access to resources in the full knowledge that they often add complexity. An important success factor is having sufficient management capacity with a working knowledge of diplomacy.

¹⁶⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3524625/>

¹⁶⁶ <http://www.londonmuseumsgroup.org/wp-content/uploads/2013/06/Memorandum-of-Understanding-Guidance.pdf>

¹⁶⁷ <http://www.imperial.ac.uk/research-and-innovation/research-office/contracts/types-of-contract/>

¹⁶⁸ <https://www.wits.ac.za/research/strategic-partnerships/>

¹⁶⁹ http://ec.europa.eu/invest-in-research/pdf/download_en/knowledge_transfe_07.pdf

¹⁷⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2946316/>

¹⁷¹ <http://research.utah.edu/documents/funding/pdf/guide-comm-based-research.pdf>

¹⁷² <http://www.agincourt.co.za/>

The types of partnerships discussed included individual, university wide, alliances of many universities and university-industry partnerships. It was noted that these partnerships are most often multi-disciplinary in nature, which adds to the complexity. Finally, the all-important university-community relationships, which support research and provide a channel for engagement to effect research findings, were discussed.

Research Management plays a number of crucial roles in establishing and maintain these relationships and to oversee the contractual arrangements that underpin the partnerships and to maintain databases of active partnerships.

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Further Resources

The following resources are free and downloadable and give insight into partnerships that benefit research.

- [How to Meet the Needs of Both Academic and Industry Partners](#)¹⁷³
- [The Cyprus Institute: Partnerships and Collaborations](#)¹⁷⁴
- [Some ethical and cultural elements of partnerships and collaborations](#)¹⁷⁵
- [Effectively engaging multiple stakeholders](#)¹⁷⁶
- [Different stakeholder groups and their perceptions of project success](#)¹⁷⁷
- [Stakeholder power analysis](#)¹⁷⁸

¹⁷³ <https://nbs.net/p/how-to-meet-the-needs-of-both-academic-and-industry-par-227bb6f3-2703-45e1-abbd-be97682f45e0>

¹⁷⁴ <https://www.cyi.ac.cy/index.php/eewrc/about-the-center/eewrc-partnerships-collaborations.html>

¹⁷⁵ <http://aiatsis.gov.au/research/ethical-research/guidelines-ethical-research-australian-indigenous-studies/participation-collaboration-and-partnership>

¹⁷⁶ <http://scalingupnutrition.org/wp-content/uploads/2014/03/Sun-in-Practice-issue-1.pdf>

¹⁷⁷ <http://www.sciencedirect.com/science/article/pii/S0263786313000276>

¹⁷⁸ http://www.policy-powertools.org/Tools/Understanding/docs/stakeholder_power_tool_english.pdf

Chapter 9: Research Funding

Introduction

This chapter discusses the Research Management competencies related to securing and managing research funding. Funding is a critical and strategic component necessary to fuel and drive most research forward. It is important to note, though, that different types of research in different disciplines have different funding requirements. Consider, by way of example, the needs of a large clinical trial and a one researcher, one student philosophy project. Nonetheless, funding is important even if it is restricted to finding postgraduate student bursaries.

As with other parts of Research Management, securing research funding is not as simple as it may at first seem. Complicating factors include, at least, (i) the competition related to securing decent funding, (ii) the ethics related to certain funding sources, (iii) the inflexibility of external funding rules, (iv) the resource hungry financial control and auditing requirements funders demand and (v) the very real threat that it can pose to academic freedom. On the other hand, the amount of research undertaken without it would be hugely diminished – consider that the internal funding¹⁷⁹ for research in a typical South African research intensive university, such as the [University of the Witwatersrand](#)¹⁸⁰, is about one tenth of what it receives from external sources. The size of this external income stream is so large and important that in university parlance it is given a special name – ‘third stream income’. Of course, the ratio between internal to external funding for research will change depending on the nature of the research organisation: consider the continuum from university through NGO, to science council and privately funded research institution. Nonetheless, in each case the role of Research Management, working closely with researchers, is vital for securing and managing research funding.

This chapter discusses the broad funding contexts and landscapes, organisation strategic positioning, grant proposal writing, as well as the cycles of research funding and the management capacities to support the development of research funding.

The Professional Competency Framework describes this key competency area as follows: to *“identify and disseminate funding opportunities; develop and implement funding optimisation strategies; support the writing of funding proposals, including alignment with stakeholder requirements, budgeting and costing and review; coordination of approvals and submissions (usually associated with pre-award activities)”*.

The Framework further disaggregates this competency into two sub-areas:

1. Sub-Area – Identifying and disseminating research funding opportunities and optimise research funding strategies;
2. Sub-Area – Developing, approving and submitting research funding proposals.

¹⁷⁹ Internal funding is derived from the institution’s own resources

¹⁸⁰ <https://www.wits.ac.za/about-wits/governance/annual-reports/>

Funding Life Cycle

Some terminology in common use will help position the contents of this chapter with that of Chapter 11: Managing Funded Research . To this end, Figure 7, adapted slightly from the University of Kansas’s website, describes the funding life cycle showing a clear distinction between pre-award and post-award activities. This chapter focuses on pre-award work, while Chapter 11: Managing Funded Research covers the post-award work. It is important to understand, though, that Research Management plays a key stewardship role in maintaining good working relations with the funder, also called the sponsor, and that this work spans both parts of the life cycle.

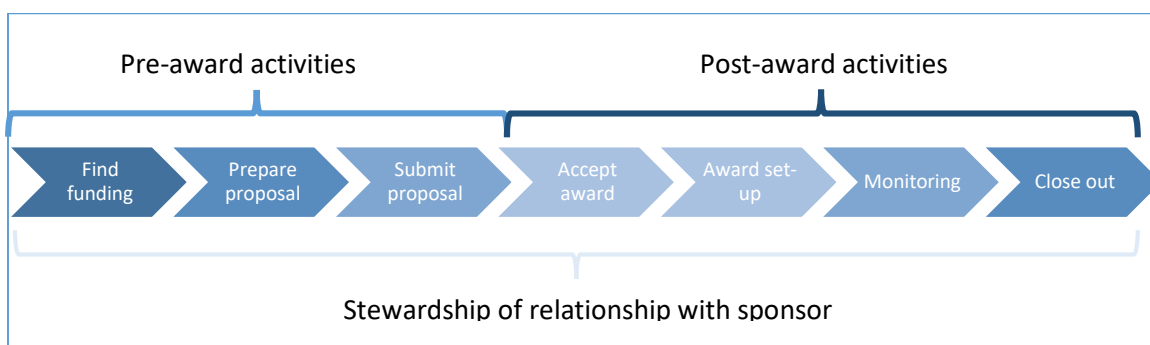


Figure 7: Award life cycle

Source: Adapted from the [University of Kansas Research Office](#)¹⁸¹

Research Funding: The Strategic Role of Research Management

During November 2010, the European Association of Research Managers and Administrators (EARMA), NCURA and Elsevier hosted a series of roundtable discussions on critical issues related to the future of Research Management. The resulting [report](#)¹⁸² indicated that the critical nature of research funding and the related need for research collaborations. It also emphasised the strategic role research managers play in securing and managing research funding and establishing and maintain collaborations at the institutional level.

Given this understanding of the importance of the role played by Research Management, it is necessary to lay bare what the role consists of.

Finding Suitable Research Funding Sources (Sponsors)

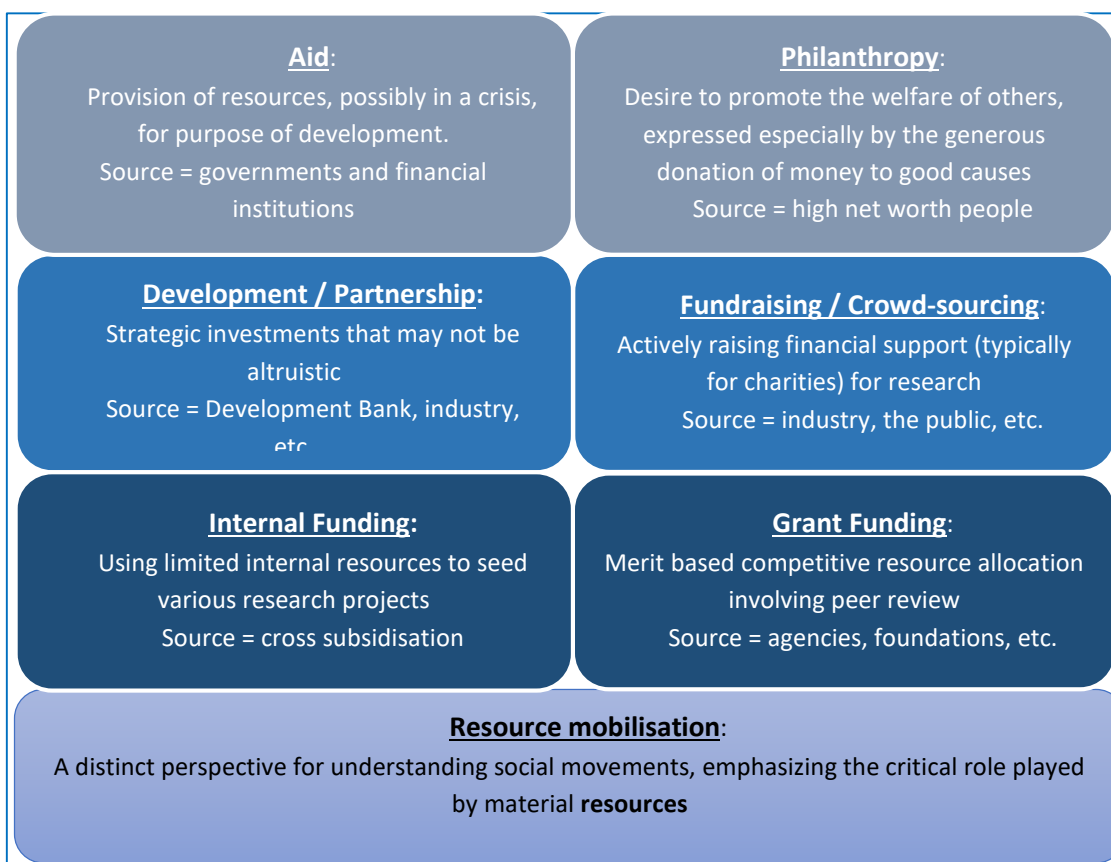
Finding funding should not be limited by our understanding of the local funding landscape. Funding is not limited to grants provided by government agencies or foundations. We need to adopt a wider perspective, as shown in Figure 8 below, which considers aid, philanthropy, partnership funding, crowd funding and internal resources as possible sources of research funding besides the normal grant funders. All of these funding sources have a common unifying description, namely resource mobilisation. This terminology is referenced to in works on community empowerment and social movements, but the term has become popular in funding circles because it encompasses a range of resources that may be assembled: from student bursaries, people mobility, equipment, and operating costs. It is also considered a user-friendly term when discussing funding needs with a sponsor.

Resource mobilisation is aimed at improving organisations capacity to mobilise funds and involves engagement with stakeholders and management processes and not only the securing of funds.

¹⁸¹ https://research.ku.edu/grants_process

¹⁸² https://www.elsevier.com/data/assets/pdf_file/0003/53193/Future_of_Research_Mngmnt_White_Paper_LO.pdf

Figure 8: Resource mobilisation as a general concept covering a wide range of potential sources for research funding



Source: Adapted from Williamson, 2010

An important question all research managers should consider deeply, so that they can advise researchers when the need arises, is: would you take funding for your research from any source? Hopefully, the answer is no and that there will be sources that you would deem as unethical or unsuitable. A trivial, but illustrative, example is the ethics related to an organised crime syndicate wanting to support research into the use of a crypto-currency for the purposes of money laundering. As always with ethical considerations they rapidly become more complex making the difference between good and bad far more subtle and difficult to distinguish than the example provided.

One last thought on this matter of the ethics of selecting funding sources would be the advice to always test the suitability of a sponsor by imagining that its financial commitment to your institution is advertised in large letters on a bill-board along a main highway. If you feel at all uncomfortable with this knowledge being made public, it best not to accept the funding. It is important for the research manager to understand that all external research funding has 'strings' attached, so select the sponsor carefully in such a way that you can live with their 'strings'.

On a more practical level, there is a range of subscription based tools that are very helpful to the research manager in the process of finding suitable sponsors to maintain the organisation's current research effort and to grow this to its full potential. It is fairly simple to justify the cost of these subscriptions as, if used diligently, they should bring in considerable third stream income.

One such tool that is very valuable to researchers and research managers alike is provided by the research focused communication company called “*Research”¹⁸³ and its [ResearchProfessional](#)¹⁸⁴ service that is billed as providing “Total Funding Awareness”. This company has a spinoff in South Africa that provides information of funding opportunities available specifically to researchers working in Africa and it is called [ResearchAfrica](#)¹⁸⁵.

Some other sources of information about research funding include:

- European Union Calls for funding proposals, such as Horizon 2020, can be sourced at this [website](#)¹⁸⁶;
- The [ESASTAP 2020](#)¹⁸⁷ provides funding opportunities for South Africa to partner with researchers in Africa on a number of funding instruments which have been created by the DST to enable the EU Programme in Science and Innovation Development;
- [InfoEd Global's](#)¹⁸⁸ Spin provides information concerning research funding opportunities (not necessarily all available to SADC based researchers) as well as support throughout the funding cycle and financial tracking;
- Most SADC governments have some sort of funding agency in place, for example, the National Commission on Research Science and Technology ([NCRST](#)¹⁸⁹) in Namibia and the [NRF](#)¹⁹⁰ in South Africa.

While it might be anticipated that the Research Management module of the Handbook should provide a very long list of funding sources, this is regarded as self-defeating. Given the ever changing nature of the funding landscape it is far better to provide the research manager with the tools to find suitable sponsors. To this end, besides the above mentioned tools, the power of Google (or similar Web browsers) should not be overlooked. To assist with such searches for suitable research funding sources the following generic model for aggregate sources of funding is provided: ‘Calls/Requests/Expressions of Interests/Solicitations around research funding’.

Communication of Research Funding Opportunities

It is important that the Research Office arranges for a dedicated person/s to keep abreast of the latest funding trends and active calls and to disseminate this information to the right people in the organisation timely enough to allow them to prepare winning proposals. This in itself poses a significant challenge for Research Management, as simply emailing out messages about funding opportunities to all in the institution may not be enough to actually catch someone’s eye and spur them on to plan a project and apply for the funding.

The best advice to deal with this situation is to use as many communications channels as are available to the Research Office – email, web, physical notice boards, Twitter, Facebook, etc. – and to tailor the messages to those who need to hear them. Avoid sending funding opportunities advertised by the [Simons Foundation](#)¹⁹¹, who fund mathematics and theoretical physics, to the Department of

¹⁸³ <http://www.researchresearch.com/>

¹⁸⁴ <http://info.researchprofessional.com/>

¹⁸⁵ <http://info.researchprofessional.com/research-africa/>

¹⁸⁶ <https://www.ox.ac.uk/research/support-researchers/research-funding?wssl=1>

¹⁸⁷ <http://www.esastap.org.za/funding/sa.php>

¹⁸⁸ <http://infoedglobal.com/solutions/grants-contracts/spin-funding-opportunities/>

¹⁸⁹ <http://www.ncrst.na/>

¹⁹⁰ <http://www.nrf.ac.za/funding>

¹⁹¹ <https://www.simonsfoundation.org/funding-opportunities/>

Arts, for example. Rather send them the opportunities from the National Institute for the Humanities and the Social Sciences ([NIHSS](#))¹⁹².

Proposal Writing For Research Funding

There is increasing demand for more sophisticated proposal writing skills. In many cases, there are specialised grant writers who are part of organisational staff. External grants writers are also often contracted in to write for a specialised granting source. Should resources not be available to have such specialised expertise, organisations often go the route of being trained on Proposal Writing for research funding. Research Offices and researchers themselves attend such training interventions.

Given the competitiveness of funding, the writing of proposals in response to the public announcement of a Call/Request/Solicitation requires a range of support from research managers. These include:

- Ensuring eligibility and administrative alignment before resources are committed further on grants that are not within the eligibility or administrative domains of the organisation/research area, etc.;
- Advising that the proposal is aligned to the organisational vision and mission;
- Leveraging the organisation's track record towards proposing for the grant and securing the funds;
- Working with the researchers to ensure alignment to the research strategy/priorities;
- Advising on/harnessing infrastructure in the organisation to support the proposal process: this includes governance, legal and financial support structures to enhance the efficiencies and effectiveness of the proposal process;
- Being knowledgeable about the lobbying and informal agendas around research funding;
- Advising on alignment of the actual criteria of the call and its fit to the researchers' needs;
- Support for the criteria for submission and quality assurance;
- Shifting the focus from proposal writing to managing research funding (assuming an award is made the emphasis shifts from pre-award activities to post-award activities);
- Exit, closure and sustainability concerns around research funding and proposing of the same.

Various Web-based resources are available on how to write a competitive grant proposal:

- The following is a [proposal template](#)¹⁹³ for grant proposal writing. It sets out the basic logic of the grant proposal format;
- Further detail regarding the grant proposal format, its various sections and tips are provided by this [link](#)¹⁹⁴;
- And yet another source of grant writing information from an [unlikely source](#)¹⁹⁵;
- Tips can be useful as an overview of key issues researchers and research managers need to consider in writing a grant proposal. [Here](#)¹⁹⁶ are some tips provided by grant application reviewers and researchers;
- Finally, YouTube videos are also available which will take you through the basic elements of grant proposal writing. By following this [link](#)¹⁹⁷, you will be able to navigate other links to grant proposal

¹⁹² <http://www.nihss.ac.za/>

¹⁹³ <http://theprofessorisin.com/2011/07/05/dr-karens-foolproof-grant-template/>

¹⁹⁴ <https://writingcenter.unc.edu/tips-and-tools/grant-proposals-or-give-me-the-money/>

¹⁹⁵ <https://www.arc.gov/funding/howtowriteagrantproposal.asp>




¹⁹⁶ <https://www.theguardian.com/higher-education-network/2015/may/10/how-to-apply-for-research-funding-10-tips-for-academics>

¹⁹⁷ <https://www.youtube.com/watch?v=hFBRgyTt7E&t=24s>

writing. The discussion covers the basic structure and elements of a grant proposal, the process involved as well as the review of grant proposals.

In closing this section, three suggestions may be considered by the Research Office as potential value adding steps in this competitive and often stressful process of securing grant funding. Arrange 'internal peer improvement' sessions where your experienced researchers help less experienced ones improve their proposals. Use Table 5 as a useful summary of tips that should be remembered when writing grant funding proposals. And finally offer chocolates to all involved – as mentioned before this can be stressful for all concerned.

Table 5: Ten tips to writing winning research funding proposals

| | |
|---|--|
|  | 1. Read the 'Call documents' carefully – understand what the funder wants and then be sure to give this to them |
|  | 2. Winning proposals consist of a novel idea that aligns with the needs of the funder and has a detailed work plan and budget |
|  | 3. Make sure you quote the literature in the proposal and give full references |
|  | 4. Collaborate to add appropriate research experience to your proposal |
|  | 5. Never assume that the peer reviewers will understand your work; gently lead them to the conclusion you want |
|  | 6. Think about the layout of your of your proposal; open the text up with blank spaces and use sub-headings to add emphasis and improve the speed reading of your proposal |
|  | 7. Make sure your proposal is properly edited |
|  | 8. Balance risk and reward: Persuade the funder that your work is worth the risk by emphasising the reward – expected outcomes |
|  | 9. Be sure to match the proposal with the funder's needs |
|  | 10. Remember when using an Online Submission system to: <ul style="list-style-type: none"> a. Write the proposal in MS Word, then copy & paste into the database b. Write clearly, economically and coherently c. Save your work as you go along d. If you do not hit an action button in 10 minutes you will be logged off |

Costing of Research

Preparing an accurate budget to cover all the costs of a research project is an integral part of writing the funding proposal. Indeed, it gives the clearest picture of what the researcher intends to do. It may be simple to couch the narrative part of the proposal in convincing, but vague language; the numbers in the budget, on the other hand, are more difficult to fudge. Thus, it is imperative that a suitable budget is included with each proposal.

This is one place where the Research Management professional can really play a proactive and supportive role, as the ability to be a top researcher does not necessarily coincide with being able to prepare suitable budgets. Matters to consider while preparing a budget include:

- Adherence with the funder's financial requirements;
- Adherence with the institution's financial requirements;
- Match between proposal narrative and budget commitments;
- Providing sufficient detail for a reviewer to assess;
- Avoid trying to win the grant by making the budget too small;
- Avoid 'padding' the budget to cover contingencies you may not have thought of.

Some web based resources that may be of value in the budgeting process include:

- The European Commission, Directorate General for Research, released a report in 2009 on external project based research funding on financial management in universities. This was part of a process to ensure that universities ensure financial sustainability through and awareness and understanding of their direct and indirect costs related to securing external research funding. The [report](#)¹⁹⁸ provides insight into the nature of costing related to external funding to universities;
- The Research Whisperer, as useful website, provides this [guidance](#)¹⁹⁹;
- The NRF, as do many funding agencies, provides a [sample budget](#)²⁰⁰ for use by applicants;
- Finally, there are many resources that are disciplinary specific that give insight into budgeting. This guidance can be very valuable as it is specific. [Here](#)²⁰¹ is one in the field of nursing research.

Any writing on the topic of research budgets cannot avoid including some remarks on the topic of full cost recovery. Previously, universities and science councils only recovered the direct costs related to their externally funded research projects, thus ignoring the real, but less obvious indirect costs – like the cost of the library, necessary utilities and indeed the cost of the Research Office.

Thankfully, modern practice is that most external funders are prepared to cover at least some of the institution's indirect costs, thus giving rise to the notion of full cost recovery (direct + indirect costs). It is vital that Research Management plays a major role in, firstly, ensuring that the institution has a policy on this matter and, secondly, in recovering the full costs (through what is sometimes called full effort costing). Guidance in this area of Research Management is provided by the WHO's Essence for Health Research and their publication called [Five Keys to Improving Research Costing in Low- and Middle-Income Countries](#)²⁰². This website has some other useful manuals plus a training module on full cost recovery.

Conclusion

This chapter began with an overview of the funding life cycle that includes two parts, namely pre- and post-award activities. As research funding is perhaps one of the most important issues for Research Management to address to promote research, a whole chapter is dedicated to the pre-award activities, including finding suitable sponsors. This search needs an open mind because sponsorship can come in the form of aid, philanthropy, partnership funding, crowd funding, internal funding as well as the normal grant funding. The ethics of sponsor choice was discussed briefly and a range of subscription based tools to help find sponsors was shared.

¹⁹⁸ http://ec.europa.eu/invest-in-research/pdf/download_en/external_funding_final_report.pdf

¹⁹⁹ <https://theresearchwhisperer.wordpress.com/2014/10/07/simple-research-budget/>

²⁰⁰ <http://www.nrf.ac.za/sites/default/files/documents/Sample%20Budget.pdf>

²⁰¹ <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.628.6530&rep=rep1&type=pdf>

²⁰² <http://www.who.int/tdr/partnerships/essence/members/en/>

The chapter concluded with some notes on how to communicate and encourage the uptake of messages about funding opportunities. The role that Research Management can play in the support of proposal writing and budgeting was also discussed.

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Further Resources

The following resources are free and downloadable and give insight into research funding.

- The Research in Germany [website](#)²⁰³ has a number of useful guides related to research funding;
- The [Essence](#)²⁰⁴ for Health research website has many high quality Research Management guides.

The following are websites of funding agencies and foundations:

- Water Research Commission ([WRC](#)²⁰⁵) in South Africa;
- Technology and Innovation Agency ([TIA](#)²⁰⁶) that funds innovation in South Africa;
- [Ford Foundation](#)²⁰⁷ active in Southern Africa.

²⁰³ http://www.research-in-germany.org/en/?wt_ga=2242695090_39318809130&wt_kw=2242695090_research%20funding

²⁰⁴ <http://www.who.int/tdr/partnerships/essence/members/en/>

²⁰⁵ http://www.wrc.org.za/pages/Research_Funding.aspx

²⁰⁶ <http://www.tia.org.za/>

²⁰⁷ <https://www.fordfoundation.org/regions/southern-africa/>

Chapter 10: Research Ethics and Integrity

Introduction

This chapter discusses the many issues related to research ethics and research integrity. Research, being the systematic search for truth and investigation of the unknown to improve our understanding, is intimately and inherently connected with the virtues of honesty, veracity and reliability. Integrity in a research context includes the trustworthiness of researchers in the ways in which they conduct themselves and their research. But most importantly for Research Management it includes the assurance that research conducted in the name of the institution is deemed to be ethical.

This chapter, therefore, is focused mainly on the practical arrangements which need to be taken into consideration in the enactment and practice of research ethics. Various components include the establishment of policies, structures and knowledge and information to enable consistent practice in the understanding and lived experience of research ethics and integrity within the research community and its relation and engagement with the broader society.

The Professional Competency Framework describes this key competency area as follows: to *“promote, foster and support research ethics and integrity, compliance and responsible research conduct”*.

Research Ethics and Integrity: Are they Different?

Before we begin, it is necessary to consider the relationship between research ethics and research integrity. They are, of course, related concepts, but ethics involves the relation between the researcher and the people, animals and environment around them. This would, for example, include the research subjects, respondents or participants. Research integrity is a broader concept related to the researcher’s personal conduct while performing research and could include data falsification and manipulation, plagiarism and misleading communication of results. For more on this difference visit [DifferenceBetween.com](http://www.differencebetween.com)²⁰⁸.

Despite this distinct difference, the understanding that they are inherently interlaced, especially in relation to policy and procedure development, means that they will be discussed simultaneously and will not be addressed separately.

Basic Principles and Useful Guidelines

Responsible research conduct is the guiding principle in the management or stewardship of research ethics. Consider for a moment the advice given by Dean Smith (Smith, 2011) who speaks, firstly, in chapter nine about the need for institutional policy which sets a standard for ethical research and expects all employed by or affiliated with the institution, including postgraduate students in universities, to be knowledgeable of and compliant with the standards. Secondly, he mentions that responsibility also needs to be delegated to individuals. Individual researchers need to take responsibility for their own conduct ensuring that compliance is not simply a ‘tick-box exercise’, but an inherent part of the practice of quality research. Thirdly, Smith addresses the issues of conflict of commitment and interest. Conflict of commitment can arise, for example, when funded by an interest or lobby group to produce research to support their cause, will raise the question, can the researcher thereafter ever be regarded as independent? Conflicts of interest ultimately involve money even

²⁰⁸ <http://www.differencebetween.com/difference-between-ethics-and-vs-integrity/>

though they may play out in peer review, publishing, hiring and promotions, and procurement decisions.

Smith (Smith, 2011) also makes it clear that it is the responsibility of Research Management to set the standards for research ethics and provide leadership for the benefit of the individuals and the reputation of the institution. Besides the more policy orientated approach to this responsibility it also behoves the research manager to investigate and act (where necessary) against research misconduct. Letting such matters slip has significant and often irreparable consequences.

Smith quotes the NIH's ethical standards. An invaluable document discussing these is found at this [webpage](https://www.niehs.nih.gov/research/resources/bioethics/whatis/)²⁰⁹ and is entitled "What is Ethics in Research & Why is it Important?" by David B. Resnik. The "SKILLSYOU NEED" website on "[Ethical Issues in Research](https://www.skillsyouneed.com/learn/research-ethics.html)"²¹⁰ is also based on Resnik's work. It has a useful code of conduct which can be used as a basis for customization to your own circumstances.

If you are called upon to give a talk on research ethics, this [website](https://www.kcl.ac.uk/sspp/policy-institute/scwru/pubs/2013/conf/stevens14feb13.pdf)²¹¹ provides a useful presentation in PDF format that provides an overview including interesting historic background. Remember if you do use it (or even part of it) you must acknowledge Martin Stevens of King's College London, otherwise you will be guilty of plagiarism: an ethical misconduct!

Digging now into the detail, the following are commonly referred to as the guiding principles for research ethics:

- **Honesty:** Strive for honesty in all scientific communications. Honestly report data, results, methods and procedures, and publication status. Do not fabricate, falsify, or misrepresent data. Do not deceive colleagues, research sponsors, or the public.
- **Objectivity:** Strive to avoid bias in experimental design, data analysis, data interpretation, peer review, personnel decisions, grant writing, expert testimony, and other aspects of research where objectivity is expected or required. Avoid or minimize bias or self-deception. Disclose personal or financial interests that may affect research.
- **Integrity:** Keep your promises and agreements; act with sincerity; strive for consistency of thought and action.
- **Carefulness:** Avoid careless errors and negligence; carefully and critically examine your own work and the work of your peers. Keep good records of research activities, such as data collection, research design, and correspondence with agencies or journals.
- **Openness:** Share data, results, ideas, tools, resources. Be open to criticism and new ideas.
- **Respect for Intellectual Property:** Honour patents, copyrights, and other forms of intellectual property. Do not use unpublished data, methods, or results without permission. Give proper acknowledgement or credit for all contributions to research. Never plagiarize.
- **Confidentiality:** Protect confidential communications, such as papers or grants submitted for publication, personnel records, trade or military secrets, and patient records.
- **Responsible Publication:** Publish to advance research and scholarship, not to advance just your own career. Avoid wasteful and duplicative publication.
- **Responsible Mentoring:** Help to educate, mentor, and advise students. Promote their welfare and allow them to make their own decisions.
- **Respect for colleagues:** Respect your colleagues and treat them fairly.

²⁰⁹ <https://www.niehs.nih.gov/research/resources/bioethics/whatis/>

²¹⁰ <https://www.skillsyouneed.com/learn/research-ethics.html>

²¹¹ <https://www.kcl.ac.uk/sspp/policy-institute/scwru/pubs/2013/conf/stevens14feb13.pdf>

- **Social Responsibility:** Strive to promote social good and prevent or mitigate social harms through research, public education, and advocacy.

A different statement of these principles can be found at the so-called [Singapore Statement](#)²¹² on research integrity that arose from the [2nd World Conference on Research Integrity](#)²¹³ held in 2010. Another useful world conference on research integrity is [Ethics and Integrity](#)²¹⁴. Local SADC research institutions also have an array of useful information on their websites, for example:

- [Ethics Institute](#)²¹⁵ is an independent South African public institute producing original thought leadership and offering a range of ethics-related services and products;
- Human Sciences Research Council (HSRC) – [click here](#)²¹⁶ for a wide variety of relevant resources from an institute that is well placed to develop high quality research integrity and ethics materials;
- Nelson Mandela University – [click here](#)²¹⁷ for ethics capacity development guidance;
- Stellenbosch University – [click here](#)²¹⁸ for general information;
- University of Botswana – [click here](#)²¹⁹ for their ethics policy;
- University of Cape Town – [click here](#)²²⁰ for an introduction to their human subjects research committee, something each institution will need at some stage;
- University of Limpopo – [click here](#)²²¹ for their animal ethics policy.

In South Africa there exist a number of laws and statutes that govern research ethics. The South African [Health Research Guidelines and Regulations](#)²²² is an important document to read and understand. The following [article](#)²²³, entitled “Implementing Ethics Policies in Developing Countries: Ploughing on Parched Ground?” by Isaac N. Mazonde, José Jackson-Malete and Jeremy Sugarman, provides an interesting perspective on the challenges of applying research ethics in developing countries in Africa.

Ethical Dilemmas

Despite all of this information and clear articulation of the guiding principles, the challenge is always how these principles are interpreted and applied within context and how competing elements are balanced. This [website](#)²²⁴ provides extensive and comprehensive examples of ethical guidelines and case studies on ethical dilemmas in various areas of research and with reference to the various principles of research ethics and integrity such as confidentiality and authorship. The value of this website is that it offers YouTube videos as well as podcasts which can be drawn upon when conducting research ethics and integrity workshops or information sessions within institutions as part of stimulating conversations on specific topics. It also highlights the value of developing similar media

²¹² [2nd World Conference on Research Integrity](#)

²¹³ <http://www.researchintegrity.org/>

²¹⁴ <http://ethics-and-integrity.net/>

²¹⁵ <https://www.tei.org.za/index.php>

²¹⁶ <http://www.hsrc.ac.za/en/about/research-ethics>

²¹⁷ [http://health.mandela.ac.za/Committees/Faculty-Research,-Technology-Innovation\(FRTI\)/Ethics-and-Research-Capacity-Development](http://health.mandela.ac.za/Committees/Faculty-Research,-Technology-Innovation(FRTI)/Ethics-and-Research-Capacity-Development)

²¹⁸ <http://www.sun.ac.za/english/research-innovation/Research-Development>

²¹⁹ http://ub.bw/download/doc_id/1780

²²⁰ <http://www.health.uct.ac.za/fhs/research/humanethics/about>

²²¹ <https://www.ul.ac.za/research/application/downloads/AREC%20Application%20for%20approval%20for%20practicals-PRA-02.pdf>

²²² <http://www.mrc.ac.za/ethics/DOHEthics.pdf>

²²³ <https://files.eric.ed.gov/fulltext/EJ902229.pdf>

²²⁴ <http://georgiactsa.org/discovery/ethics-center.html>

tools as well as sharing negative stories as part of learning and professional development within the context of Southern Africa and beyond.

Training and Capacity Development

Training and skills development is important in the process of developing and maintain a culture of ethical research in any organisation. The following are some useful places to read more about or to organise capacity development workshops:

- Advancing Research Ethics Training in Southern Africa (ARESA) is focused on research ethics training across the region and more information can be gained from their [website](#)²²⁵;
- The [Steve Biko Centre for Bioethics](#)²²⁶ at the University of the Witwatersrand;
- [Continuing Education](#)²²⁷ programme at the University of Pretoria.

Free online training is available at:

- [Global Health Training Centre](#)²²⁸;
- [360 Training.Com](#)²²⁹;
- [Open Culture](#)²³⁰;
- [LearningPath.org](#)²³¹;
- And finally the online [book](#)²³² by Stanley Korenman is a valuable resource.

Conclusion

Research ethics and integrity are vital to ensuring the good reputation and quality of research of individuals and the institution. Thus, it is of great importance to Research Management to ensure a good policy framework and standards are in place to enable ethical research. In this chapter the guiding principles for research ethics including honesty, objectivity, integrity, carefulness, openness, respect for intellectual property, confidentiality, responsible publication and mentoring, respect for colleagues and social responsibility were discussed. To assist the research manager with this competency various online policies, codes of conduct, strategies and training opportunities were shared.

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Further Resources

The following resources are free and downloadable and give in depth insight into research ethics and integrity.

- American Psychological Association – [click here](#)²³³ for their five principles;
- Northumbria University – [click here](#)²³⁴ for research ethics and governance handbook;
- University of Edenborough – [click here](#)²³⁵ for a code of ethics and a procedure;

²²⁵ <http://www.sajbl.org.za/index.php/sajbl/article/view/166/166>

²²⁶ <https://www.wits.ac.za/bioethics/>

²²⁷ <http://www.ce.up.ac.za/Course?tabid=58&Course=122e86f3-b8f2-df11-9e88-0050569b0004>

²²⁸ <https://globalhealthtrainingcentre.tghn.org/elearning/research-ethics/>

²²⁹ <https://www.360training.com/free-online-courses/free-online-courses-old/hr--ethics---compliance>

²³⁰ <http://www.openculture.com/professional-ethics-a-free-online-course>

²³¹ <http://learningpath.org/articles/Free Online Ethics Courses from Top Universities.html>

²³² <https://ori.hhs.gov/education/products/ucla/default.htm>

²³³ <http://www.apa.org/monitor/jan03/principles.aspx>

²³⁴ <https://www.northumbria.ac.uk/static/5007/research/reghandbook.pdf>

²³⁵ <https://www.ed.ac.uk/informatics/research/ethics>

- University of Oxford – [click here](#)²³⁶ for an all-round useful resource on ethics.

The following resources are available to order at cost.

- Research ethics and integrity for social scientists: Beyond regulatory compliance, Edition 2, SAGE: https://play.google.com/store/books/details?id=Ld_SAwAAQBAJ&rdid=book-Ld_SAwAAQBAJ&rdot=1&source=gbs_vpt_read&pcampaignid=books_booksearch_viewport.

²³⁶ <https://researchsupport.admin.ox.ac.uk/governance/integrity>

Chapter 11 Managing Funded Research

Introduction

This chapter discusses the post-award research funding activities and is the logical extension of Chapter 9: Research Funding. The focus is on the contractual arrangements of award acceptance, the essential components of financial management in a project setting, project management in the sense of delivering on the proposal, especially progress reporting, and the important project closeout done in such a way that the sponsor is likely to fund another project. Part of the responsibility of Research Management in this process is to train, develop and manage relevant human resource capacity to support the effective implementation of sponsored projects.

The Professional Competency Framework describes this key competency area as follows: “*Research contracts negotiation and management; research financial management; funder/sponsor engagement and liaison; research project management (usually associated with post-award activities)*”.

The Framework further disaggregates this competency into two sub-areas, namely:

1. Sub-Area – Research contracts negotiation and management;
2. Sub-Area– Research financial and project management

Post-award Activities

Securing research funding is only half of the challenge, using it wisely constitutes the other, arguably more important, half of the funding life cycle (see Figure 7: Award life cycle in Chapter 9). Once again this offers a rich opportunity for Research Management value addition.

A variety of Research Office members get involved with the post-award activities. As illustrated in Figure 9, these include the (i) **legal services** guiding the contracting phase of award acceptance, including agreements on intellectual property arrangements, (ii) **finance division** accepting the funds,

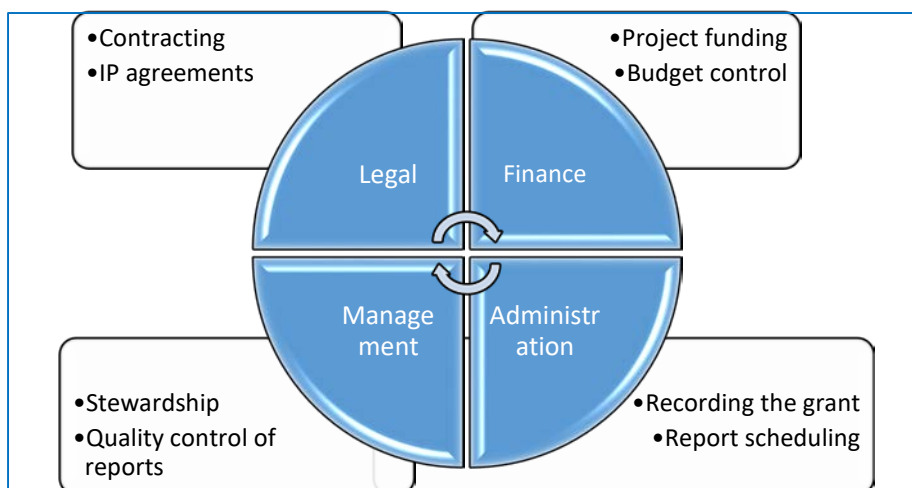


Figure 9: Function within the Research Office to deal with post-award activities

prosecuting processes related to the accounting of their expenditure, financial controls, etc., (iii) **general administration** which will set up reporting schedules to remind the researchers of their requirements and record the grant in the external funding database, and (iv) **management** who will take on the responsibility of

stewardship of the relationship of the institution with the funder – writing thank you letters, inviting key people to important institution functions, etc. – and providing for quality control of the entire process including reports sent by the researchers to the funder.

The Scope of Research Office Responsibilities

Once a researcher has secured funding, the institution accepts regulatory and fiduciary responsibility for managing and reporting on the use of the funds. This is because research funding is normally always given to the institution in the name of the researcher, and when this is not the case, that is when the funder gives the award directly to the researcher, be on high alert for potential malpractice.

The Research Office plays a pivotal role in the management of the funds on behalf of the institution and the individual researcher and it is important that the research manager ensures that there are a sufficient number of high quality finance officers available to manage this work – including ensuring that the conditions and time-lines of the grant are adhered to and the management of the funds within the institution’s management structure and financial system.

Although financial management is largely centred on institutional rules and processes, and therefore beyond the scope of this module of the Handbook, here are some processes from various institutions that may help one to set up your own processes or for benchmark against a good standard:

- Wellcome Trust – [click here](#)²³⁷ for guidelines on managing grants;
- University of California: San Diego – [click here](#)²³⁸ for basic responsibilities;
- University of New Hampshire – [click here](#)²³⁹ for financial management guidelines;
- University of Texas, Dallas – [click here](#)²⁴⁰ for award management guidelines;
- Harvard University – [click here](#)²⁴¹ for guidelines for managing an award.

Financial management, especially of external funding, will most often be subject to **audit**. A word of advice here is to ask for a previous audit scope so that you can be sure that the Research Office is covering all the bases. Clean audit reports are an important aspect of sponsor-relationship stewardship and so the pressure is on the Research Office to ensure that no irregular transactions occur. This YouTube [video](#)²⁴², although strongly USA focused, does give some insight into the level of attention to detail that is required.

In addition to the Research Office taking responsibility for financial management of research funding, the researcher too has responsibility for using the funds appropriately. Too often researchers are heard saying “but this is my money” implying they can use it to achieve their project needs no matter how they change. Although it is true that it was their intellectual capacity that secured the funding, its expenditure must be within the framework of the approved proposal and both the institutional and funder’s regulations. It is the responsibility of Research Management to ensure this happens.

²³⁷ <https://wellcome.ac.uk/funding/managing-grant>

²³⁸ <https://blink.ucsd.edu/research/managing-awards/financial/responsibilities.html>

²³⁹ <https://www.unh.edu/research/financial-management-0>

²⁴⁰ <https://research.utdallas.edu/opm>

²⁴¹ <https://osp.finance.harvard.edu/managing-award>

²⁴² <https://www.youtube.com/watch?v=Q9pQYu1hX7c>

Good Practice Guides for Financial Management of Research Grants

The following guides: [one](#)²⁴³ and [two](#)²⁴⁴, are relevant right from the inception and planning phase of the grant through the entire grant cycle. They are, therefore, relevant both in the administration of external grants received as well as the initiation and development of an internal grant cycle.

Given the number of research grants and contracts managed by a Research Office suitable software will, at some stage, become necessary. Two possibilities are presented by way of example, but great care must be exercised by the Research Management in implementing such systems because they are expensive and must integrate seamlessly with existing institutional software. This can be tricky, to say the least. The possibilities include [itworks](#)²⁴⁵ and [InfoEd](#)²⁴⁶. The benefits of such software are that they can ensure effective access to information, track funding and manage incoming funding in a more effective manner. It also allows for the better integration of research management information for planning.

Grants and Contracts

Given the importance of the contractual arrangements in post-award activities, it is important to consider the difference between grants and contracts. Although used interchangeably by some, there is a difference, which lies in the legal obligation of the contract to produce results from the research project (CapturePlaning.com, 2015). Thus, a grant is awarded to advance research and knowledge (and to train students), while a research contract is a binding agreement to produce specific knowledge. Thus, in the case of a grant there may be no contractual or legal consequences when results are not forthcoming, but in the case of a contract there are likely to be. However, even if no legal consequence arises, non-delivery means it is unlikely that a recipient will receive further contract funding.

It is clear, therefore, that contract management is very important for the reputation of the researcher and the institution. Furthermore, a large proportion of the responsibility to steward this process successfully lies at the door of the Research Office. To provide support in this arena the reader is directed to a best practice guide for Research Contract Management, developed with the support from the EU funded [RIMI4AC](#)²⁴⁷ project. While the booklet is relevant to Stellenbosch University (where it was developed), it is also of value to a broader audience. It includes compliance, risk assessment, human resources and financial-related issues and clarifies the roles and responsibilities involved in each role for effective research contract management. It can be downloaded from this [website](#)²⁴⁸ using “RIMI4AC” as the keyword search criterion.

Diverse Types of Contracts

There is a wide range of contracts that may be needed to protect the various parties in contract research agreements. Some examples include (i) the commissioned research agreement, (ii) the grant agreement, often referred to as the ‘Conditions of Grant’ (which are often not negotiable), (iii) the consortium agreement and (iv) the collaboration agreement. It is important to use the most appropriate agreement template with its attendant legal language to begin the negotiation process that will culminate in a binding agreement. Once again this may be beyond the delegation authority

²⁴³ https://www.dpc.nsw.gov.au/_data/assets/pdf_file/0009/92349/101117_Good_Practice_Guide_Nov_2010_Revision.pdf

²⁴⁴ <http://archives.gadoe.org/DMGetDocument.aspx/EssentialsofGrantsManagement.pdf?p=6CC6799F8C1371F66CEF72E8CD67388DDE32B5705066C91D2CAA546454A0CF7A>

²⁴⁵ <http://www.itworks-inc.com/>

²⁴⁶ <http://infoedglobal.com/>

²⁴⁷ <http://www.sarima.co.za/projects/rimi4ac/>

²⁴⁸ <https://www.acu.ac.uk/publications/>

or even the knowledge of the research manager, in which case it is important to secure the services of a suitably briefed lawyer. The implication of suitably briefed is that the lawyer understands the research process, particularly its fragility, and is therefore willing to take some risk in order to advance knowledge.

Imperial College London and the University of Cambridge have useful databases of contract templates on their respective websites: [ICL](#)²⁴⁹ and [CAM](#)²⁵⁰. It is important to remember though that all contracts are in principle negotiable. Typically this negotiation is carried out by the Research Office on behalf of the researcher. Therefore, negotiation skills are an important competency for research managers.

There are a host of online resources to support one's negotiation efforts, [here](#)²⁵¹ is one. But these seven thoughts may be helpful to remember before and during the negotiations.

1. **Preparation:** Always prepare thoroughly by studying the person/organisation that will sit on the other side of the negotiating table and understand the options available to both parties;
2. **Breakeven point:** Understand exactly what the minimum you can afford to come out the negotiations with. Never compromise this point, rather walk away without an agreement;
3. **Go first:** Where possible, put your offer on the table first and thus begin talks around your terms and not someone else's terms;
4. **Discuss:** Discuss the offer on the table diligently: be sure to understand the offer on the table;
5. **Deal:** Make a genuine attempt to strike a deal through making compromises, but ensure point 2 is never violated;
6. **Agreement:** Reach an agreement, but be sure there are no untested assumptions in the agreement;
7. **Integrity:** Always conduct the negotiations with integrity and leave the negotiating table without compromising your respect for and the dignity of your negotiating partner – no matter the outcome.

Intellectual Property and Licensing Agreements

Research institutions regularly enter into intellectual property and licencing agreements. These relate to knowledge and technology transfer and thus fall beyond the scope of this module. They are covered in detail in the TT/IM module of the Handbook.

Conclusion

The best possible management of funded research is crucial in an environment where reputation and integrity are important. Thus, high quality management of funded research is not only a necessity for public good and an exemplar of good governance; it is also a precursor for repeat or additional funding of research. Clearly team efforts are needed to ensure the exemplary management of funded research including well trained finance officers and well briefed lawyers. Again, Research Offices should explore the role of technology and grant management systems in order to create a more optimum environment for managing public and private funds endowed by others for the sake of research.

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²⁴⁹ <http://www.imperial.ac.uk/research-and-innovation/research-office/contracts/types-of-contract/>

²⁵⁰ <https://www.research-operations.admin.cam.ac.uk/research-contracts/types-contracts>

²⁵¹ <http://smallbusiness.chron.com/top-ten-effective-negotiation-skills-31534.html>

Chapter 12: Research Data and Research Information Management

Introduction

Data, and increasingly, digital data are at the heart of research. Unsurprisingly, therefore, research managers are expected to have competence in the areas of the management of research data and the related, but distinct field of research information management. This chapter provides an overview, firstly, of data science including data related policy, infrastructure and performance development. Secondly, it considers the importance of research information management to produce intelligence for strategic planning and performance management.

The Professional Competency Framework describes this key competency area as follows: to *“develop research data management plans and support systems; databases and information systems; research data management; reporting”*.

The Importance of Digital Data to Modern Research

Astronomers no longer look through their telescopes and sociologists no longer jot down notes during interviews. Why? Because their data are recorded digitally through the detector and the audio-recorder allowing for asynchronous analysis using mathematical and stochastic techniques (Hilbert, 2011) (Gibbs & Friese, 2002). Thus, the world has entered the digital era (Figure 10) where data science, that is the knowledge of how to manage and analyse large and complex digital data sets, became valuable not only for the numeric sciences, but also to the social sciences and digital humanities. It is this digital data analysis that drives the Fourth Industrial Revolution (Schwab, 2017).

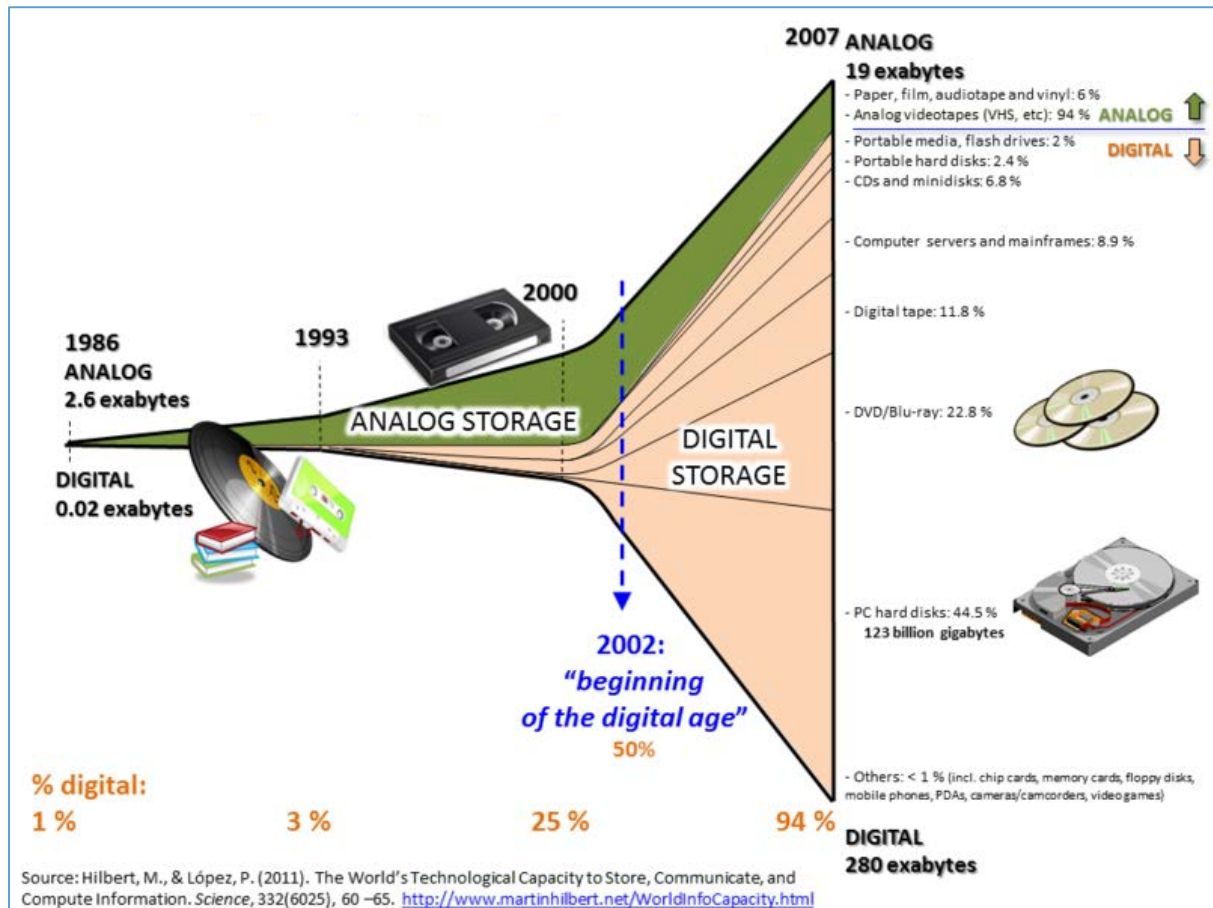


Figure 10: The explosion of the global information storage capacity

So called 'Big Data' includes data sets with sizes beyond the ability of commonly used software tools to capture, curate, manage and process data within a tolerable elapsed time (Wikipedia, 2018). According to this Wikipedia entry (Wikipedia, 2018), Big Data can be described by the following characteristics:

- **Volume:** The quantity of generated data is important in this context. The size of the data determines the value and potential of the data under consideration, and whether it can actually be considered big data or not. The name 'big data' itself contains a term related to size, and hence the characteristic.
- **Variety:** This is the category of big data, and an essential fact that data analysts must know. This helps people, who analyse the data and are associated with it, to effectively use the data to their advantage and thus uphold the importance of the big data.
- **Velocity:** 'Velocity' in this context means how fast the data is generated and processed to meet the demands and the challenges that lie in the path of growth and development.
- **Variability:** This refers to inconsistency the data can show at times—which hampers the process of handling and managing the data effectively.
- **Veracity:** The quality of captured data can vary greatly. Accurate analysis depends on the veracity of source data.

- **Complexity:** Data management can be very complex, especially when large volumes of data come from multiple sources. Data must be linked, connected, and correlated so users can grasp the information the data is supposed to convey.

To disentangle research from data science will be difficult, if not impossible, and so Research Management will have to develop a working knowledge of these concepts. The role of the research manager is not that of a data engineer, that is, a system and hardware expert setting up connected clusters of switches and central processing units, rather the role is to facilitate conversations between the core engineers, data scientists and researchers (from all disciplines) to expedite their research in the digital age – to be the ‘third’ person in these conversations.

Research Data Management or eResearch

It is vital that the Research Office provide a service, an ‘eResearch’ service, to all researchers who need assistance with their research data needs, for example, a means of capture, curation, storage, achieving, and sharing. As the Research Office may provide a legal service for good contracting to advance research, so too must it provide a data management service to advance digital research. This service needs suitable policy and strategy development and specialist technical knowledge. Thus, the research manager is called upon to find the specialist knowledge in the institution (possibly in the ICT department or even in the Library), to write enabling policies and to co-ordinate all of these stakeholders for the benefit of researchers. One suggestion for beginning this process is to start with a researcher who has in-depth technical knowledge of his/her data needs; an electrical engineer or a computer scientist for example. They will be able to blaze a trail for you to follow with the less informed researchers to come.

Any discussion about the management of Big Data will soon gravitate towards the pros and cons of ‘cloud storage’. According to [TechTarget](#)²⁵² “Cloud computing is a general term for the delivery of hosted services over the internet. It enables [organisations] to consume a compute (sic) resource, such as a virtual machine, storage or an application, as a utility – just like electricity – rather than having to build [it for themselves]”. Thus, data storage can be a service rather than a room of buzzing computers. The good news is that Africa is well down this road. The African Research Cloud ([ARC](#))²⁵³, for example, will allow researchers in Africa and their collaborators to access research data storage and compute facilities from anywhere in the world, while ensuring the data lives in Africa and remains the intellectual property of scientists on the continent. It will combine distributed data storage, compute resources, other cyber infrastructure, and skills development among the partners into a seamless research and development platform.

As always context will influence strongly the exact nature of the data service you provide, but presented here are some useful webpages that describe what others have done.

Africa sites:

- University of Cape Town – [click here](#)²⁵⁴ for their eResearch facility which “accelerates research”;
- Makerere University – [click here](#)²⁵⁵ for their training on research methods and data management;

²⁵² <http://searchcloudcomputing.techtarget.com/definition/cloud-computing>

²⁵³ <https://www.arc.ac.za/>

²⁵⁴ <http://www.eresearch.uct.ac.za/>

²⁵⁵ <https://courses.mak.ac.ug/courses/research-methods-and-data-management>

Comprehensive sites:

- University of Cambridge – [click here](#)²⁵⁶ for a comprehensive research data service from repository through policy to training;
- Manchester University – [click here](#)²⁵⁷ for a comprehensive research data management service;
- University of Hong Kong – [click here](#)²⁵⁸ to see their policy on the management of research data;

Strategy, policy and definition sites:

- Cornell University – [click here](#)²⁵⁹ for their strategic approach to research data management;
- Heriot Watt University – [click here](#)²⁶⁰ for their policy and data guidelines from UK funders;
- University of Leicester – [click here](#)²⁶¹ for a definition of what research data management is;

Library sites:

- Association of College and Research Libraries – [click here](#)²⁶² for an explanation of how the Library plays a vital and important role in research data management;
- Curtin University – [click here](#)²⁶³ to see how their Library is involved;

Training sites:

- Coursera – [click here](#)²⁶⁴ for their training on research data management and sharing;
- University of Helsinki – [click here](#)²⁶⁵ for their training of PhD students in research data management.

²⁵⁶ <http://www.data.cam.ac.uk/>

²⁵⁷ <http://www.library.manchester.ac.uk/using-the-library/staff/research/services/research-data-management/>

²⁵⁸ <http://www.rss.hku.hk/integrity/research-data-records-management/>

²⁵⁹ <https://data.research.cornell.edu/content/about>

²⁶⁰ <https://www.hw.ac.uk/services/is/research-support/research-data-management.htm>

²⁶¹ <http://www2.le.ac.uk/services/research-data/rdm/what-is-rdm>

²⁶² <http://acrl.libguides.com/scholcomm/toolkit/datamanagement>

²⁶³ <http://libguides.library.curtin.edu.au/research-data-management>

²⁶⁴ <https://www.coursera.org/learn/data-management>

²⁶⁵ https://liber2016.org/wp-content/uploads/2015/10/WS2_RDM_HULib_Finland.pdf

In bringing this section to a close, it is worth considering an EU based study of 17 institutions that explored the funding of research data management, which is a significant cost endeavour for most institutions. The [study](#)²⁶⁶ considers the sources and areas for which funding is required. Figure 11 is a diagrammatic representation that indicates the various areas of the data cycle for which funding is needed.

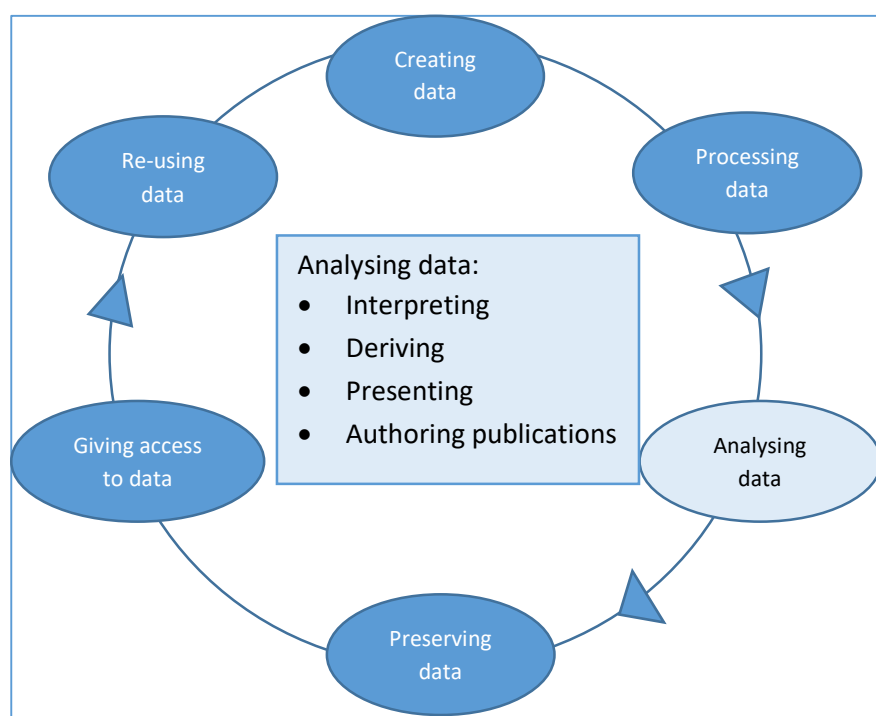


Figure 11: Financial needs of the data cycle

One message of the study is that for individual organisations to duplicate infrastructure for these data processes can be wasteful and that collaboration will bring critical mass effectively.

Open Science and Open Data

This digital era has also heralded increased focus on the openness in science characterised by the sharing of information. Open Access (OA) journals have been with us for some years now and are becoming increasingly popular as they realise citations more rapidly than traditional print runs. (NB! Without wanting to get side tracked, the use of OA journals must come with two warnings: first a safety warning that authors should stay well clear of predatory journals²⁶⁷ and a financial warning that the cost of publishing is often for the author's account while the cost of subscriptions is for the institutional account.) More and more agency and foundation funders now require the sharing of raw research data. This is both a burden and a boon. The burden arises from the technical aspects of sharing and managing large data sets as described above. The boon is that your researchers now have access to other people's data, if your organisation can import it appropriately.

The good news is that SADC is amongst the forerunners in this space and in 2016 an African strong initiative, was launched by [CODATA](#)²⁶⁸ with this statement:

"The Africa-wide initiative will promote the development and coordination of data policies, data training and data infrastructure. An open science platform is conceived as an integrated set of arrangements that provides a policy, capacity-building and infrastructural framework for enhanced accessibility and impact. The initiative also

²⁶⁶ <http://aims.fao.org/activity/blog/funding-research-data-management-and-related-infrastructures>

²⁶⁷ In academic publishing, **predatory** open-access publishing is an exploitative open-access publishing business model that involves charging publication fees to authors without providing the editorial and publishing services associated with legitimate **journals** (open access or not).

²⁶⁸ <http://www.codata.org/news/151/62/Open-Science-in-Africa-and-in-South-Africa>

focuses on the creation of national Open Science through which policies and coordination can be discussed and established.”

CODATA is the Committee on Data of the International Council for Science (ICSU). [CODATA](http://www.codata.org)²⁶⁹ exists to promote global collaboration to improve the availability and usability of data for all areas of research. CODATA supports the principle that research data should be “as open as possible and as closed as necessary”. By promoting the policy, technological and cultural changes that are essential to make research data more widely available, CODATA helps advance ICSU’s mission of strengthening international science for the benefit of society.

Research Information Management – Meta-Data

Changing tack now we consider the subject of data about research: meta-data that will give insight and intelligence helping Research Management to plan strategically to grow the quality and quantity of research production.

This subject is of strategic importance to Research Management and is neatly termed **research information management**. But what are these data that give such valuable insight? A comprehensive list is not possible because they are so eclectic and varied. But by way of illustration research management data may include bibliometric data, HR data, financial data, facility data, collections data, test subject data, and so forth. The trick is to combine and link these divergent data sets into a uniform and meaningful information service. The data scientists refer to a ‘data warehouse’, that is a large store of data accumulated from a wide range of sources within an organisation and used to guide management decisions.

A UK study of 21 Higher Education Institutions entitled “[Research Information Management: Developing Tools to Inform the Management of Research and Training – Existing Good Practice](#)”²⁷⁰ gives great insight into this surprisingly complex subject. The study is important to the context of research information management as it aimed to:

- Develop an understanding of research management metrics;
- Develop an overview of the systems used by the institutions;
- Review the sector’s success in implementing research management systems and what could be improved;
- Compare the variety of tools available in the market globally;
- Evaluate the ways in which institutions create tools to manage research-related data from systems;
- Share ways of integrating tools;
- Translate good practice; and
- Constitute a resource to the higher education sector.

Research Information Management Systems

The UK study mentioned above presents a useful table of service providers and their capabilities in the area of research information management systems. Some of these service providers advertise ‘an end to end’ service, Table 6 clarifies this clearly. It also shows that a number of these products are needed to cover all the Research Management data needs.

²⁶⁹ <http://www.codata.org>

²⁷⁰ <https://www.snowballmetrics.com/wp-content/uploads/research-information-management1.pdf>

Table 6: Suppliers mapped to information needs

| Research Office Information needs | Agresso | Alta | Atira (Pure) | BlueQube | DSpace | Elsevier (Scopus, SciVal) | ePrints | Imprints | InfoEd | Inteum | MylP | Oracle Grants | pFACT | ResearchResearch | SAP Grants Mngt | Symplectic | TechnologyOne | Thomson ²⁷¹ | Wellspring |
|--------------------------------------|---------|------|--------------|----------|--------|---------------------------|---------|----------|--------|--------|------|---------------|-------|------------------|-----------------|------------|---------------|------------------------|------------|
| Identify funding | | | X | | | X | | | X | | | | | X | | | | | |
| Calculate costs | X | | | | | | | | X | | | | X | | | | | | |
| Monitor grant success | | | X | | | | | | X | | | | | | | | | | |
| Manage funds | X | | | X | | | | | | | | X | | | X | | X | | |
| Monitor research outputs | | X | X | | X | X | X | X | X | X | X | | | | | X | | X | X |
| Show case strengths | | | X | | X | X | X | X | | | | | | | | X | | | |
| Researcher collaboration | | | | | | X | | | | | | | | | | | | | |
| Institutional collaboration | | X | | | | X | | | X | | X | | | | | X | | X | X |
| Business development | | X | | | | | | | X | | X | | | | | | | | X |
| Identify talent | | | | | | X | | | | | | | | | | X | | | |
| Scenario plan | | | | | | | | | | | | | | | | | | | |
| Number of needs met | 2 | 3 | 4 | 1 | 2 | 6 | 2 | 2 | 6 | 1 | 3 | 1 | 1 | 1 | 1 | 4 | 1 | 2 | 3 |

Source: Adapted from the [UK Study](#)²⁷²

Research information is not only of valuable at the institutional level, but also at the national (or even regional) level. Data informed policies developed by governments are the way to go. The question is how best to collect research data at the national level.

Besides the annual South African R&D survey, conducted by the [HSRC](#)²⁷³ using the [OECD Frascati Manual](#)²⁷⁴ of meta-data, the DST also experimented with a national level Research Information Management System ([RIMS](#))²⁷⁵. Without going into excessive detail the DST, with NRF management, implemented RIMS on the understanding that it would pay for a national licence for the [InfoEd](#)²⁷⁶ platform to be used by many universities and most science councils for their own management purposes, but with the understanding that they will use the system to collect aggregated national level data. It collected mainly research publication data and was moving towards collecting grants and contract data when a number of issues, mainly involving uptake and costs, lead to the cessation of national funding. The national data warehouse is now populated manually while some universities continue to use the InfoEd system; others have moved to [Converis](#)²⁷⁷ and others developed their own in-house systems mainly for annual research publication reporting requirements.

Conclusion

Digital data are ubiquitous and the challenge is to use them efficiently and effectively. This chapter looked at data from two aspects: firstly, it considered the role of the Research Office in advancing

²⁷¹ Now Clarivate Analytics

²⁷² <https://www.snowballmetrics.com/wp-content/uploads/research-information-management1.pdf>

²⁷³ <http://www.hsrc.ac.za/en/projects/view/KDBAAA>

²⁷⁴ <http://www.oecd.org/sti/inno/frascati-manual.htm>

²⁷⁵ <http://www.nrf.ac.za/research-platforms/research-information-management-system>

²⁷⁶ <http://infoedglobal.com/>

²⁷⁷ <https://clarivate.com/products/converis/converis-us>

research through the provision of data services related to capture, collation, storage, sharing and management. Secondly, the chapter looked at research information systems that Research Offices can use to collect information to guide strategic decision making.

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Further Resources

The following resource is available to order at cost.

- The Amazon book, called “Data Science for Dummies”, 2015, by Lillian Pierson:
<https://www.amazon.com/Data-Science-Dummies-Lillian-Pierson/dp/1118841557>.

Chapter 13: Research Uptake, Utilisation and Impact

Introduction

The medieval origins of the modern university began as monastic schools (*scholae monasticae*), in which monks taught students (Wikipedia, 2017). Some of these institutions transformed into modern universities, the oldest extant one being the University of Bologna (University of Bologna, 2018). According to Jane Carruthers (Carruthers, n.d.):

“The current formal university structure in South Africa began with the establishment of the University of the Cape of Good Hope in 1873. Receiving its Royal Charter in 1877, it was modelled on the University of London. Neither of these universities in London or Cape Town had campuses or resident students. Instead, they were examining bodies that guaranteed quality by setting examinations and conferring degrees on students who passed the required examination no matter where they acquired the appropriate knowledge.”

Thus globally, and in South Africa (which can be logically extended to the SADC region), higher education started off with a teaching focus. However, over time these teaching institutions became increasing research focused as a result of rising global competition and various conflicts including two world wars. It was an American engineer, by the name of Vannevar Bush (Dennis, 2017), who did much to cement university and science council research and innovation as valuable tools to grow economies and promote competitiveness. His role in the Manhattan project showed how concerted research efforts can change the course of history (Kelly, 2007).

Thus, today there is increasing pressure and expectation from governments, funders and the general public that science (in its broadest sense) will yield benefit and value. For this to happen research uptake, utilisation and impact are important concepts.

Research Management has a significant role to play to address wide-spread social justice agendas that include research for society, citizen science initiatives and science communication and engagement. While there is a generic component to research uptake, utilisation and impact which is based on the principles of making research accessible to wider and often non-academic audiences, there is also a specificity in terms of how researchers themselves target their stakeholders for the uptake, utilisation and ensuring their impact of their research. This chapter, therefore, points research managers to the fact that researchers often have their own networks for this dimension of Research Management. It is acceptable, therefore, to put principles, systems and structures in place to facilitate this area, but it is equally important to work in a consultative and participatory manner with researchers in order to tap into their networks and facilitate from a position of strength, rooted in the knowledge production of different disciplines and researchers.

That being said, we acknowledge the caveat that this module of the Handbook will not cover the diverse resources that exist for discipline-specific areas of research uptake, utilisation and impact. Research managers will facilitate researchers to follow those pathways.

The Professional Competency Framework describes this key competency area as follows: to “dissemination and communication of research; knowledge transfer; business development; measuring and demonstrating research impact”.

What are Research Uptake, Utilisation and Impact?

The Netherlands Organisation for Scientific Research ([NWO](https://www.nwo.nl/en))²⁷⁸ “ensures quality and innovation in science and facilitates its impact on society. Its main task is to fund scientific research at public research institutions in the Netherlands, especially universities”. This NRF equivalent indicates that research uptake activities [aim](#)²⁷⁹, firstly, to support the supply of research to users by ensuring research questions are relevant through engagement with these users, communicating research effectively and synthesising and repackaging research for different audiences, and, secondly, to support the usage of research by strengthening commitment and capacity of research users to access, evaluate, synthesise and use research evidence.

A wonderful example of research uptake as defined above is the Wits Reproductive Health Institute ([WRHI](http://www.wrhi.ac.za/))²⁸⁰. As their website indicates, their aims consist of a mixture of research, policy development and service delivery, as shown by these statements:

- To understand pathways for intervention;
- To improve access to quality services;
- To expand prevention and treatment choices;
- To generate data for policy and programming;
- To build research capacity to expand generation and application of evidence.

The early part of the 20th Century saw the founding of various science councils in South Africa: Council for Geoscience in 1912, Mintek in 1934 and the CSIR in 1945. Their purpose was specifically to use research to benefit various parts of the economy, namely economic geology, mineral processing and industry and manufacturing. Other examples of Southern African institutions using knowledge they generate to improve society include the South African [HSRC](http://www.hsrc.ac.za/)²⁸¹, the Namibian National Botanical Research Institute ([NBRI](http://www.nbri.org.na/))²⁸² and the Botswana Institute for Technology, Research and Innovation ([BITRI](http://www.bitri.co.bw/))²⁸³, to name but three. [Here](#)²⁸⁴ is an interesting paper with the title of “Uptake and impact of research for evidence-based practice: lessons from the Africa Health Systems Initiative Support to African Research Partnerships” that further investigates this matter.

How-to Guides

What can the Research Office do to support research uptake and impact? One [strategy](#)²⁸⁵, provided by the NWO, involves integrating four complementary and interrelated sets of activities:

1. **Context analysis and stakeholder engagement:** early engagement and investing in building relationships with relevant stakeholders;
2. **Knowledge sharing and communication:** knowledge sharing and communication are central to enhancing the availability, relevance and accessibility of research;
3. **Assessing and strengthening research uptake capacities:** this concerns both internal capacities (consortium/team) as well as the capacities of stakeholders;

²⁷⁸ <https://www.nwo.nl/en>

²⁷⁹ <https://www.nwo.nl/en/about-nwo/organisation/nwo-domains/wotro/Impact+toolkit/Impact+toolkit++Research+Uptake>

²⁸⁰ <http://www.wrhi.ac.za/>

²⁸¹ <http://www.hsrc.ac.za/uploads/pageContent/3868/Research%20Uptake%20HSRC%20Seminar%2014%20Aug%202013.pdf>

²⁸² <http://www.nbri.org.na/>

²⁸³ <http://www.bitri.co.bw/>

²⁸⁴ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4108907/>

²⁸⁵ <https://www.nwo.nl/en/about-nwo/organisation/nwo-domains/wotro/Impact+toolkit/Impact+toolkit++Research+Uptake>

4. **Monitoring, learning & evaluation:** project teams are expected to integrate research uptake objectives and expected results as outcomes and outputs in the Impact Pathways (and Theory of Change).

Another home grown answer is at hand, thanks largely to a project called “Development Research Uptake in Sub-Saharan Africa” ([DRUSSA](#))²⁸⁶. DRUSSA was a five-year, [DFID](#)-funded programme supporting 22 universities across Africa to strengthen the management of research uptake. It ran from October 2011 to September 2016.

The purpose of DRUSSA was to help improve the capacity of universities to contribute research evidence in pro-poor policy and practice. DRUSSA achieved this through sharing learning on institutional change and research uptake strategy, supporting training of university staff in research uptake and communication, and through facilitating and strengthening networks between DRUSSA universities, other research management bodies, external stakeholders and research users, including policymakers.

Of the DRUSSA deliverables two guides written for [Early Career Researchers](#)²⁸⁷ and for institutional [Media Officers](#)²⁸⁸ are of particular value.

Another globally relevant [website](#)²⁸⁹ on the topic was prepared by Research into Action. It offers a range of videos on the topic of uptake and impact. They introduce the concept of a ‘knowledge broker’, someone who can help connect knowledge producers with knowledge users. Finally, the document entitled “A guide to policy engagement and influence”, available at this [website](#)²⁹⁰, uses a RAPID (Research and Policy in Development) Outcomes Mapping Approach (ROMA) which is a stakeholder consultative approach that integrates research with societal needs.

A Word of Caution

It is unlikely to hear anyone arguing against the need for research uptake in our world that faces many significant issues from climate change to the increasing burden of disease (non-communicable and infectious), social cohesion (or lack thereof) and inequality. However, not all research can make instant or significant change. Besides, research for the sake of the knowledge it produces rather than the impact, is still important. It is after all, the wellspring for pioneering ideas that will have impact in the future.

[Louise Shaxson](#)²⁹¹ of the London School of Economics also cautions against the increasing pressure that all researchers must show that their research has impact, in her blog entitled “Research uptake and impact: are we in danger of overstating ourselves?” Thus, the Research Office must carefully navigate a thin line between overstressing it researchers, but still making a difference.

Conclusion

This chapter has shown that universities moved from largely teaching organisations to research intensive organisations. The perceived success to improving competitiveness gave rise to a number of science councils whose sole purpose is to use research for the benefit of society. The question how

²⁸⁶ <https://www.acu.ac.uk/focus-areas/research-management-uptake/drussa>

²⁸⁷ <http://researchuptakeguide.drussa.net/>

²⁸⁸ <http://researchuptakeguide.drussa.net/researchcommunicationguide.drussa.net/index.php/essential-skills-for-research-communicators/delivering-an-engaging-public-talk/>

²⁸⁹ <http://www.researchtoaction.org/>

²⁹⁰ <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9011.pdf>

²⁹¹ <http://blogs.lse.ac.uk/impactofsocialsciences/2013/01/24/8864/>

the Research Office can support research uptake and impact was answered mainly by considering the DRUSSA project deliverables. The chapter concluded with a cautionary word indicating that not all research must have impact.

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Appendix: Building the Structure of the Ideal Research Office

The structure of your Research Office will match your strategic needs, there is no ideal structure. However, to provide you with some practical help in setting up a contextually appropriate Research Office you may want to conduct the following exercise.

Step 1: Take the list of typical demands on a Research Office, from Table 1: The many functions of a Research Office on page 8 in Chapter 2, and add items that may be unique to your circumstances. I have added ethics management and researcher development.

| Function |
|--|
| * NEW * Ethics management |
| * NEW * Researcher development |
| Audit (of technology, project progress and finances) |
| Benchmarking |
| Business systems |
| Clinical research and governance |
| Consultancy |
| Contract negotiation |
| Development of research strategy and themes |
| Horizon scanning |
| Internal peer review |
| Knowledge Transfer and Intellectual Property |
| Management information and reporting |
| Monitoring and evaluation, and metrics |
| Networking with funders |
| Portfolio management & reporting, trend analysis |
| Post award management and adherence to funder and statutory terms and conditions |
| Pre-award skills, research development and costing methodologies |
| Project management of large contracts and bids |
| Relationship building with international funders, stewardship |
| Spin outs and commercialisation |
| Using knowledge about individual and collaborative disciplines |

Step 2: Classify each of these functions according to the criteria used in the Professional Competency Framework's three hierarchical levels of work, namely: (i) administrative/operational, (ii) management and (iii) leadership/strategic. (See page 31 of Chapter 4.) Then sort the table by competency.

| Function | PFC |
|--|----------------|
| Pre-award skills, research development and costing methodologies | Administrative |
| Internal peer review | Administrative |
| Post award management and adherence to funder and statutory terms and conditions | Administrative |
| Audit (of technology, project progress and finances) | Administrative |
| Project management of large contracts and bids | Administrative |
| Business systems | Administrative |
| Monitoring and evaluation, and metrics | Administrative |
| Benchmarking | Administrative |
| Management information and reporting | Administrative |
| Portfolio management & reporting, trend analysis | Management |
| Networking with funders | Management |
| Clinical research and governance | Management |
| Relationship building with international funders, stewardship | Management |
| Ethics management | Management |
| Development of research strategy and themes | Strategic |
| Horizon scanning | Strategic |
| Contract negotiation | Strategic |
| Using knowledge about individual and collaborative disciplines | Strategic |
| Knowledge transfer and intellectual property | Strategic |
| Spin outs and commercialisation | Strategic |
| Consultancy | Strategic |
| Researcher development | Strategic |

PCF = Professional Competencies Framework

Step 3: Now add the skill sets you think a person will need to fulfil this function. I have chosen to add two levels of skills sets - you may want to add more. I have limited myself to the following skill sets:

| Skill set | Description |
|---------------------|---|
| Analytical | An ability to analyse data inputs into information outputs |
| Business | Knowledge of the world of competitive business in the free market |
| Data science | Some knowledge of the WWW, how to extract and manipulate data |
| Finance | Accounting, audit, bookkeeping, control, etc. |
| Governance | Assurance, committee structures, risk analysis, etc. |
| Legal | Legislative frameworks |
| Organisation | An ability to organise events, etc. |
| PM | Project management skills |
| PR | Public relations - people skills |
| Research | First-hand knowledge of the research process and even some disciplinary knowledge |

Thus my table looks like this:

| Function | PFC | Skill set 1 | Skill set 2 |
|--|----------------|--------------|--------------|
| Benchmarking | Administrative | Data science | Analytical |
| Management information and reporting | Administrative | Data science | Analytical |
| Monitoring and evaluation, and metrics | Administrative | Data science | Analytical |
| Audit (of technology, project progress and finances) | Administrative | Finance | Research |
| Business systems | Administrative | Finance | PM |
| Post award management and adherence to funder and statutory terms and conditions | Administrative | Finance | Organisation |
| Pre-award skills, research development and costing methodologies | Administrative | Finance | Research |
| Internal peer review | Administrative | Organisation | |
| Project management of large contracts and bids | Administrative | PM | |
| Portfolio management & reporting, trend analysis | Management | Data science | PM |
| Clinical research and governance | Management | Governance | |
| Ethics management | Management | Legal | PM |
| Networking with funders | Management | PR | |
| Relationship building with international funders, stewardship | Management | PR | PM |
| Consultancy | Strategic | Business | Legal |
| Spin outs and commercialisation | Strategic | Business | Legal |
| Using knowledge about individual and collaborative disciplines | Strategic | Data science | PR |
| Contract negotiation | Strategic | Legal | |
| Knowledge transfer and intellectual property | Strategic | Legal | Business |
| Development of research strategy and themes | Strategic | Research | |
| Horizon scanning | Strategic | Research | Data science |
| Researcher development | Strategic | Research | PR |

Step 4: Now delete the functions that you are not called upon to deliver. What are leftover are the elements of your Research Office which you can then structure appropriately.

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