Research Infrastructure Policy

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Research Infrastructure Policy

1 Preamble

As a pre-eminent University in Africa, driven by its pursuit of knowledge and innovation, with a unique institutional culture based upon the values the University espouses, the North-West University has adopted this Research Infrastructure Policy on 20 June 2014.

2 Aim of policy

The aim of the research infrastructure policy is to provide a focused approach towards the management of research infrastructure (RI), to ensure that researchers at the NWU can deliver state of the art research outputs. The planning, funding and management processes described in this policy aims to achieve best practice, based on the directions other similar research organisations are taking in the world and the national strategies that are developed for research funding and RI funding.

3 Scope of Policy

This policy should be read with the Institutional Research and Innovation Strategy approved by Senate annually. This policy should also be read against the mission of the NWU to produce high-quality, relevant and focussed research, basic as well as applied, supplying innovative solutions to challenges faced by the scholarly community, the country, the continent and the world. Furthermore, as stated in the Institutional Plan, the NWU strives *towards becoming a balanced tuition-research university*[1] with a growing 3rd income stream from commercialisation and making a significant impact through community engagement.

4 Definitions

Research Infrastructure (RI) includes facilities, resources and services used by the scientific community across all disciplines for conducting cutting edge research for the generation, exchange and preservation of knowledge. It includes major facilities, equipment or sets of instruments, collaborative networks and knowledge-containing resources such as collections, archives and data- and biobanks. Research Infrastructure may be "single-sited", "distributed", or "virtual" (the service being provided electronically). It includes cyber-infrastructure to connect these facilities and people and structured information systems related to data management, enabling information and communication. RI addresses the physical sciences, engineering, life sciences, social sciences and humanities, and the environment.

5 Policy Statement

It is the policy of NWU that Research be executed in identified Research Entities which promote innovative research and innovation for the economic development of the country, the continent and the world.[2] Taking into account the financial constraints within which the NWU functions, the necessary research infrastructure to support such research will be developed and sustained by the NWU.

Principles:

- The NWU will manage through its structures, as close as possible to the end user community, the total cost of ownership of the infrastructure, including supporting infrastructure, procurement cost, installation cost, running expenses, insurance, decommissioning, research and other outputs, etc.

- The NWU will sponsor, within the financial constraints imposed on it, research infrastructure. Co-funding must also be sought from outside sources, such as the NRF National Equipment Program, TIA, or any other source.

- Meaningful centralisation in terms of sharing, utilisation management, cost recovery, economy of

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[1] There is general consensus that this has now been achieved. As soon as a process to formulate a new mission statement has been completed, this statement will be updated.

[2] See the Research and Innovation Policy, approved by Council in September 2013.

scale, avoidance of duplication, etc. will be promoted.

- Staffing matters such as subject specialists, operators, support staff, training not covered in the initial procurement contract, and any other staffing matters, will be budgeted for in the normal way.

- The NWU will maintain a budget to cater for unforeseen and exceptional maintenance, in the case where this is not covered by the insurance or normal maintenance contracts.

- The NWU will strive towards establishing a virtual infrastructure management system which will store and provide all information necessary to effectively manage its infrastructure.

- Training labs are not regarded as RI.

6   Implementation

This Policy will be implemented through the RI Strategy, as described in Appendix A.

Research Infrastructure Strategy

1   Introduction

The aim of this strategy is to provide a focused approach towards the management of research infrastructure (RI), to ensure that researchers at the NWU can deliver state of the art research outputs. The planning, funding and management processes described in the Strategy aims to achieve best practice, based on the directions other similar research organisations are taking in the world and the national strategies that are developed for research funding and RI funding.

Smaller, less expensive equipment not addressed by this Strategy should be purchased and managed according to existing budgeting processes and do not necessarily require the detailed level of planning suggested in this Strategy. The cut-off point for formal planning is set at RI above the current replacement value of R200 000.

The NWU has a variety of RI management models, which complement each other in the different application environments. For the self-supporting equipment-intensive research facilities, the current practice should be maintained, supported by this Strategy.

2   Definitions

The following definitions are important to set a common understanding for the RI landscape:

Research Infrastructure (RI) includes facilities, resources and services used by the scientific community across all disciplines for conducting cutting edge research for the generation, exchange and preservation of knowledge. It includes major facilities, equipment or sets of instruments, collaborative networks and knowledge-containing resources such as collections, archives and data- and biobanks. Research Infrastructure may be "single-sited", "distributed", or "virtual" (the service being provided electronically). It includes cyber-infrastructure to connect these facilities and people and structured information systems related to data management, enabling information and communication. RI addresses the physical sciences, engineering, life sciences, social sciences and humanities, and the environment.

Well-found laboratory: A well-found laboratory has the minimum level of equipment, at an acceptable quality and quantity available to support research which is part of the strategic plan of an individual, department, research group or institution. Such equipment is acquired to support a broad range of research projects, or a specific research project. Equipment purchases are funded by research grants of individuals, departments, research groups or institutions. Long term plans for the sustainability of a well-founded laboratory exist to ensure the competitive edge of the individual, department, research group or institution. A well-founded laboratory is a precondition to host infrastructure for world-class science.

World-class infrastructure: World-class infrastructure refers to state-of-the-art RI for competitive research and research training. This includes RI to be used by more than one discipline and RI that is usually funded on a national, regional or inter-institutional level. Such RI often fits in with national science, technology and industrial strategies and most often requires specialised operation and management environments where the user does not necessarily operate the RI. World-class RI normally has a long range life cycle and is usually supported by a well-founded laboratory environment.

Infrastructure Life Cycle: The life cycle approach has many strategic impacts and need to be deployed fully in planning, budgeting and management of RI.

Figure 1 shows the RI life cycle and the important steps along this cycle. It is important that RI gets acquired and applied according to the institutional objectives. These objectives drive the priorities for the acquisition and deployment of RI. Before RI is acquired, it is of utmost importance to appraise the full life cycle costs and not to only consider the capital layout required to acquire the RI.
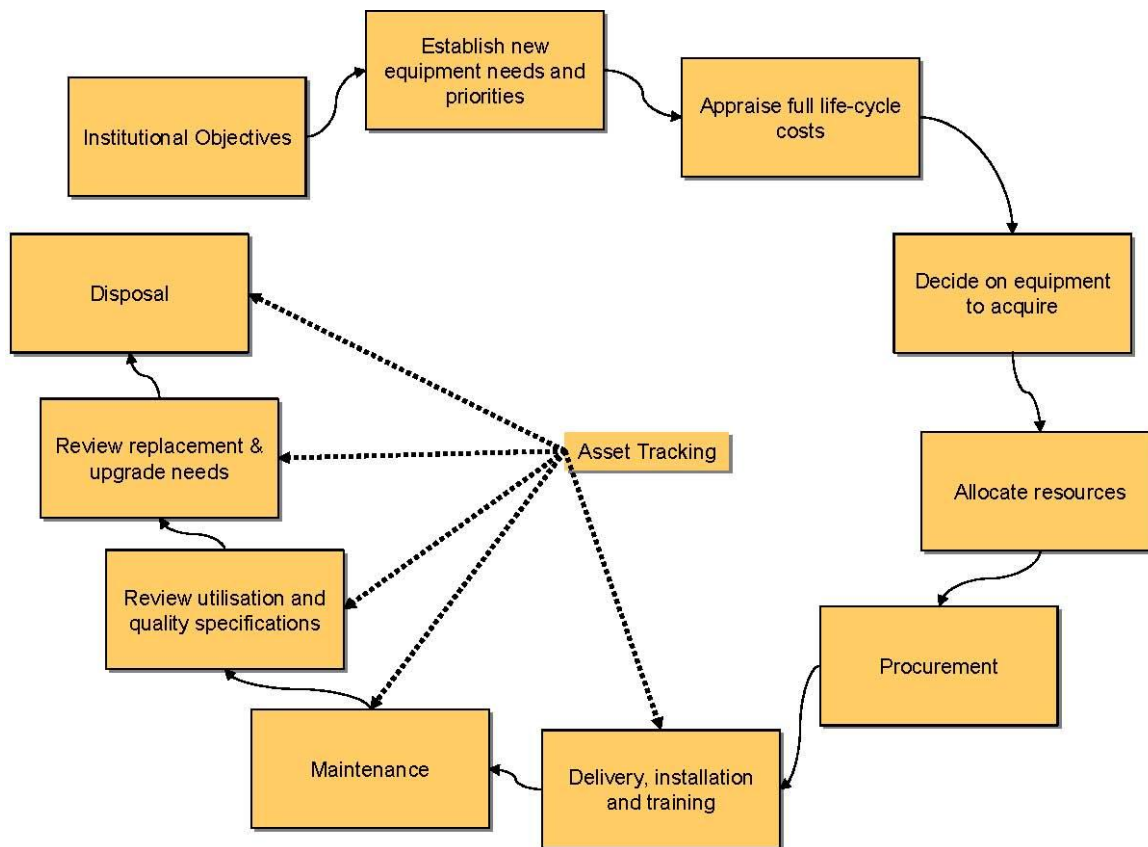
Figure 1: RI Life Cycle

3 Types of RI

The following types of RI are covered by the Strategy:

3.1 RI built by original manufacturers

This includes all RI purchased as complete working units or components and attachments to existing items of RI that have been manufactured by international original manufacturers and supplied either directly or through agencies in South Africa.

3.2 Self-developed RI

Self-developed RI, by instrument makers or research staff at the university, must be included in the planning and funding process. Often such RI is not available on the market due to the specialised nature and must be developed in-house. In general the policy is that RI, commercially available and within required specifications for the research, should be bought, provided that the price is not significantly disadvantageous.

3.3 Computing facilities

Computing equipment is distinguished as follows:

3.3.1 High Performance Computing Cluster (HPCC)

The HPCC at the university is maintained by the IT department.

3.3.2 Advanced workstations joined together in a network to address specific research

An example is the language technology laboratory (CTeXt). This is a dedicated laboratory where the personal computers are used for a specific research focus. Such facilities are budgeted for under the normal funding schemes proposed in this Strategy.

3.3.3 Control computers, integrated with RI

These computers are to be included for as an integral part of the RI. These computers will fall under the maintenance, upgrade and replacement policies of the Strategy.

4 Responsibilities

4.1 Management Responsibility

The DVC: RIT in consultation with the research community is responsible for the development of this Strategy.

Line Managers (Vice Rectors: Research, Deans and Research Entity Directors/Leaders) are responsible for the execution of this Strategy, with the assistance of the Research Support Office, Libraries and the other consultative and coordinating mechanisms created and described in this document. Research entity Directors / Leaders are responsible for the life cycle planning related to RI. This task is allocated to the relevant Dean should RI be procured and not be linked to research entities.

Line management tasks include:

- Managing the planning and budgeting cycles for RI as an integrated activity with existing research plans and budgeting processes.

- Optimising the impact of RI on quality research output.

- Managing the use of RI to derive optimal usage of RI.

- Ensure optimal access of RI to other management units within the NWU.

4.2 The Research Support function

The Institutional Research Support office is responsible for the implementation of the support functions related to this Strategy. Tasks include:

- Coordinating the call for RI, the evaluation process and prioritisation of requests based on the input of Research Support Office, line management and the relevant researchers.

- Provision of suitable management information regarding RI through the Virtual Equipment Store on the Intranet.

- Monitoring and reporting the effective and optimal use of RI through the relevant line managers responsible for RI.

4.3 Ownership of RI

All RI belongs to the NWU, regardless of whether that RI has been bought with first, second (grants), or third stream funding. The procurement division of the NWU is responsible for insurance of RI and the logging of appropriate information on the NWU management information system. "Ownership" of RI refers to cost centre allocation, responsibility for management, maintenance, monitoring and reporting of RI usage, availability and operation and responsibility for the responsible usage and optimal sharing.

4.4 Additional Requirements

The following additional arrangements apply:

- Access is to be guaranteed to all users on a pre-agreed basis, unless RI is declared dedicated.

- Operator and scientific support are to be provided to users when using the RI.

- Access is to be guaranteed to all data accumulated during experiments for an 'external' user.

- Specialised RI with special operating requirements can only be operated by staff suitably trained.

- It is recommended that all users (including internal users) pay a pre-agreed tariff including a component for real costs, maintenance, upgrading and replacement of the RI.

5 RI Strategy

This Strategy addresses only RI. RI can be divided into the two major classes (*see definitions*):
- Well-founded laboratory

- World-class infrastructure

To achieve this Strategy, the university sets the following objectives for RI:

- The university will equip itself to a level where it will remain internationally competitive and locally relevant in research. It will strive to be the best equipped university for research of a world-class nature in selected research entities and be the first choice for researchers from the institution itself and

elsewhere to conduct their research.

- Existing management structures will be utilised as far as possible to include the management of RI.
- Recognition, at the highest level, of the importance of RI in the success of establishing the university as a research leader.
- Commitment, at the highest level, towards the maintenance of a sustainable RI budget.
- Implementation of this Strategy will be through the Institutional Department of Research Support.
- Optimal leveraging of national RI funds such as the NRF Equipment Programme, the NRF Equipment Loan Programme and private sector participation.

5.1 Prioritizing RI

The following aspects must be taken into account when determining the priority of RI.

5.1.1 Strategic alignment

- The RI must be aligned with the strategies of the NWU, as encapsulated in the various policies and procedures driving research.
- The RI must be aligned with the strategic plan of a NWU approved Research Entity or Faculty.
- The RI must contribute towards the outputs of the NWU. In priority order, this will include research publications (articles, books, and conference contributions), student outputs, contract research, commercial income generation, etc.
- The track record of outputs of the group, as described above, must be considered.

5.1.2 RI Type

Utilisation of the RI by various groups must be considered: Students (Masters, Doctoral), single researcher or a group of researchers, in a single entity or across boundaries of entities, faculties, institutions, countries.

A greater priority should in general be given to RI that can be used for a variety of purposes, and in different research programs. However, circumstances sometimes dictate that single-purpose RI used in a controlled environment is essential.

The relationship between the various RI's of the NWU must be considered. Priority should be given to RI that will also enhance the capability of other RI within the NWU.

5.1.3 Scientific motivation

The scientific merit of RI must be evaluated, but can only be done by peers working in a broadly similar field. For this reason, each faculty must consider the scientific merit of RI before an application for funding can be considered.

5.2 Establishing life-cycle planning

Only proposals for new RI that are well supported by research business plans and full life-cycle planning of RI will be considered. Such life cycle costing are to include full life-cycle costs and will include:

- Cost of feasibility study to establish the best vendor;
- Capital cost for acquiring the RI;
- Cost of transport, installation, commissioning and training;
- Insurance costs;
- Maintenance costs;
- Depreciation model for securing funds for upgrades and replacement;
- Operator and technical assistant costs;
- Costs for disposal of RI.

Rolling plans for four to seven years are to be developed and maintained. Research entity Directors / Leaders are responsible for life-cycle planning.

5.3 Centralisation of RI

Meaningful centralisation in terms of sharing, utilisation management, cost recovery, economy of scale, avoidance of duplication, etc. will be promoted. The advantages of centralisation are provided below

- Accessibility of RI to a wide range of users;

- The grouping together of RI with complementary capabilities and ranges;

- Avoiding duplication and the creation of overcapacity in RI;

- Maximising technical and operator support;

- Minimising RI downtime by eliminating many different operators on RI;

- Encouraging research collaboration between researchers from different disciplines;

- Optimising and controlling income-generating activities on RI;

- Optimisation of usage of expensive RI;

- Central management to improve productivity of RI;

- Shared costs of infrastructure and services;

- Larger bargaining power against suppliers of capital goods and services;

- Better security and improved insurance policies;

- Breaking down or connecting silos among faculties and research entities.

The following levels of centralisation can be used as guidelines:

- Generic types of RI to centralise at the university level include:

    o Microscopy (electron, confocal, scanning probe, etc.);

    o Surface analysis (XPS, SIMS, Auger Electron Spectroscopy);

    o Compositional and structural analysis (High frequency Nuclear Magnetic Resonance Spectroscopy, X-Ray Diffraction, X-ray Fluorescence Spectroscopy, High Resolution Mass Spectrometry);

    o Collections (fossils, literature, herbariums, zoological samples, etc.).

- Generic types of RI to centralise at research entity level or institute or school level include:

    o Analytical Services (HPLC, GC-MS, ICP-MS, Mass Spectroscopy, Infrared Spectro-photometry);

    o Biotechnological analysis (DNA sequencing, incubators, cell counters, etc.).

Faculties are encouraged to centralise RI as far as practical.

5.4   Multi-use of RI

Multi-user RI is RI shared by more than one researcher, research group or discipline from inside or outside the university. Guidelines for multi-use include:
- Where possible, very expensive RI items purchased should be made available in the multi-user mode;

- RI with unique properties or specifications should be multi-user in nature;

- RI that does not experience high capacity usage should be multi-user;

- RI that may be difficult to offer for multi-use:

    o RI that is dedicated to a specific research environment;

    o RI that handles samples that should be protected from contamination;

    o RI that is built into a dedicated research line or interfaced with other RI;

    o RI that experiences full capacity usage;

    o Routine analysis RI.

6   Financial Considerations

6.1   Funding for new RI

A regular annual cycle for applying for RI funding from the university has been implemented by the Institutional Research Support Office. The criteria described in this document are applicable in determining the allocation of funds, as well as the priorities set by the applicants. Funds are allocated such that research

impact is maximised.

Centralised RI, used by more than one management entity (across campuses / faculties / research entities) is to be planned on the basis of participation by all relevant management structures, guided by the Research Support Office. The budget and management of such a facility is then allocated to the relevant research entity to host it.

6.2   Funding for maintenance

Maintenance funds are established at campus and faculty level, except where self-supporting dedicated RI facilities are concerned. These maintenance funds should be adequate to deal with planned maintenance and preventative maintenance. Where possible, bulk or site maintenance contracts should be established by the research entity responsible for the RI.   The associated costs are recouped from users of the RI by determining an RI usage fee.

6.2.1   Urgent Replacement / Maintenance

Unforeseen, urgent replacement and maintenance not covered in the proper life cycle planning and regular maintenance of RI described above, are budgeted centrally.   If unforeseen urgent replacement or maintenance is needed, the relevant campus Vice Rector is notified for immediate consideration and recommendation to DVC: RIT.   Appropriate measures regarding delegations and cost centre access allow expeditious acquisition of replacement or maintenance.

6.3   Funding for upgrade and replacement

Funding for upgrade and replacement forms part of the RI life-cycle.   RI upgrade and replacement are planned, prioritised, funded as part of the normal RI acquisition process.

6.4   Marketing of RI

Line managers responsible for RI are responsible for the optimal usage of that RI.   The application of expertise, which is one of the core functions of the university, includes the optimal use of RI and facilities for community outreach programmes as well as for commercial usage.

Using RI to earn third stream income is encouraged, provided the availability of RI is not compromised, since research takes priority.   Provision should be made to recoup the pro rata cost associated with the maintenance, upgrades and replacement of the RI from the external users.

6.5   Develop and make public a database on RI

The university maintains an RI database (the virtual Equipment Store) within the Institutional Department of Research Support that is published on the Intranet to show the state of available RI. Such a database provides a view of what kind of RI is available at the institution and to provide access to the RI. The criterion of R200 000 for replacement value in this Strategy is used as a lower cut-off point.   The University asset register lists all capital RI including items below the cut-off value.

6.6   RI insurance

A central RI insurance policy is held by the Office of the Executive Director of Finance. This policy is adjusted as new RI is purchased and updated on a regular basis.