Our Vision

To provide innovative and advanced digital technologies and research computing services of nationally and internationally recognised quality and standards, which will facilitate research excellence at the University of St Andrews.
1. Background

IT Services has been providing a dedicated research support service for the Faculty of Arts since 2003. In the light of demands from principal investigators within the University of St Andrews for assistance with research projects, and from the UK government, Research Councils and journal publishers for improvements in the way research data is managed, IT Services is working at extending the existing successful service to include the research community in other parts of the University and to enhance existing Research Data Management (RDM) services in order to comply with these new and increased needs.

The following sections of this document detail:

2. The benefits to researchers, the University of St Andrews and for IT Services of providing a research computing service;
3. Testimonials received by the Research Computing team from researchers within the University, from student interns and from peer reviewers of applications for funding.

"The next generation of scientific discovery will be data-driven discovery. ... We need to make sure we capture value from this mass of data – both for economic growth and for social advances, such as better health. ... This requires a transformation in data management."

Speech by the Chancellor of the Exchequer, Rt Hon George Osborne MP, to the Royal Society (9 November 2012): http://www.hm-treasury.gov.uk/speech_chx_091112.htm

"As a first step towards this intelligent openness, data that underpin a journal article should be made concurrently available in an accessible database. We are now on the brink of an achievable aim: for all science literature to be online, for all of the data to be online and for the two to be interoperable."

2. Strategy

2.1. Vision
To provide innovative and advanced digital technologies and research computing services of nationally and internationally recognised quality and standards, which will facilitate research excellence at the University of St Andrews.

2.2. Mission
To support research processes and outcomes through the provision of high-quality, dependable technical solutions for the storage and publication of digital research data and other outputs throughout their life-cycle by:

- providing technical support and advice to research projects within the University of St Andrews;
- assisting with Research Data Management procedures;
- preserving digital data in the long term;
- supporting the academic principles of transparency of process and of distributed peer review through the adoption of an Open Development Method for the creation of software and research tools.

2.3. Strategic priorities
Throughout the period 2012 to 2015 the Research Computing Service will continue a process of transformational change to IT provision in the University that is responsive to the needs of the institution and of researchers. Where appropriate, new areas of service provision will be developed based on identified needs.

Priorities of the service include:

- establishing new members of the team;
- consolidating the currently established service provision;
- extending the service offering to include other faculties such as Sciences, Medicine, and Divinity;
- establishing closer links with the Library.

2.4. Operational framework

2.4.1. National and international levels
Activities of the service are determined by recognised national and international best practices related to the creation and handling of research data and by the use of accepted standards.

Best practices that are of relevance to the service are, amongst others, detailed in:

- OECD Principles and Guidelines for Access to Research Data from Public Funding (2007),
- Keeping Research Data Safe (2008),
- Sustainable Economics for a Digital Planet (2010),
The Research Computing service interfaces with academic workflows that require transparency and openness and with emerging research funder requirements in regard to the publication of electronic research outcomes. This focus along with associated recognised best practices and recommendations require the service to comply, wherever possible, with a set of technical and procedural standards that form basic operational principles:

- For technical development work and data creation the use of Open Source software and Open Standards will be preferred over proprietary or closed software and standards.
- The emphasis of the service on Research Data Management (RDM) and on Digital Preservation (DP) mean that the service will comply or work towards complying with a number of procedural standards, including:
  - Open Archival Information System (OAIS, ISO 14721:2003)
  - Data Seal of Approval (DSA)
  - Trustworthy Repositories Audit and Certification (TRAC, ISO 16363:2012), and
  - Information Security Management System (IMIS, ISO 27001).

In addition to recognised professional standards and best practices, the operational framework for the Research Computing Service is determined by funder and legislative requirements. The RCUK Common Framework on Data Policy and the resulting EPSRC Policy Framework on Research Data are of especial relevance.

As demanded by the EPSRC Policy Framework, the service will – as far as it is within the IT Services remit – implement effective mechanisms for “data curation” throughout the “data lifecycle”. In line with EPSRC requirements “data curation” and “data lifecycle” are defined by the Digital Curation Centre (DCC).

2.4.2. Institutional level
Within the University the Research Computing Service is aligned with the University of St Andrews Research Data Management Roadmap (2012-2015) and with the ICT Strategy 2012-2015.

2.5. Aims

2.5.1. Research Data Management
In collaboration with other parts of the University, the Research Computing team will take the lead in the further development and implementation of RDM services and procedures within IT Services.

This aim supports the EPSRC requirement for full institutional compliance with their policy framework by 1st May 2015, the University of St Andrews Research Data Management Roadmap, and the vision expressed in the ICT Strategy of “providing an empowering platform ... for knowledge creation and exchange” directly.

2.5.1.1. The Research Computing Service will build on existing service provision and will develop further into an academic data service for the research community within the University of St Andrews.

Supporting activities:
- Research Data Management Project
- Digital Archiving Project

2.5.1.2. The Research Computing Service will review its infrastructure to align it with recognised RDM, DP and information security standards; and, based on identified need, will expand the infrastructure to allow for economies of scale at the institutional level.
Supporting activities:

- Review of existing infrastructure
- Development and maintenance of repository-type technical solutions that cater for a variety of institutional and user needs:
  - Digital Archiving Project
  - Image database
  - Video database
  - Digital Humanities repository (Library)
  - ViDaas
  - RDM Roadmap implementation projects

2.5.1.3. Drawing on the expertise from national bodies like JISC, the Digital Curation Centre (DCC) and the Digital Preservation Coalition as well as on the experience of other UK universities the Research Computing Service will in collaboration with colleagues from the Library implement RDM procedures and associated standards and best practices to take care of aspects of data retention and security. Where ever possible use will be made of recognised existing work that has been carried out by other organisations, such as the use of the Research Information Network categorisation of research data.\textsuperscript{10}

Supporting activities:

- RDM roadmap implementation

2.5.2. Service expansion

In support of RDM and the goal of IT Services to make the service more widely available within the University, the Research Computing Service aims to expand.

2.5.2.1. Include the faculties of Sciences, Medicine and Divinity in existing and developing service provision.

Supporting activities:

- RDM roadmap implementation
- implementation of repository-type technical solutions
- extension, where appropriate, of existing service provision to researchers outside the Faculty of Arts

2.5.2.2. Outside the Sciences some of the research undertaken is unfunded or has unfunded periods. To support unfunded research the service aims to expand its development remit to academically prioritised unfunded projects.

Supporting activities:

- increased emphasis on RDM planning (as part of the RDM roadmap implementation)
- investigate possibilities for academic prioritisation of development work for unfunded projects, e.g. through an academically led prioritisation board
2.5.3. **Service review**

To keep service provision aligned with the needs of the University and users and to implement best practice in RDM, a regular review process will be introduced.

2.5.3.1. The Research Computing Service will implement a rolling process that reviews academic support needs and the appropriateness of the services provided.

Supporting activities:
- RDM planning exercises as part of involvement in applications for research funding
- rolling Data Asset Framework (DAF)\(^ii\) audits of 4-5 Schools per year
- annual Collaborative Assessment of Research Data Infrastructure and Objectives (CARDIO)\(^iv\) audits that with the help of the DCC were customised to suit the local context.

2.5.4. **Leadership and collaboration**

In line with the RDM Roadmap, the Research Computing Service aims to lead and to actively participate in national and regional research data initiatives, to be regarded as a partner of choice for collaborative work within its areas of expertise, and to be seen by other institutions as an authoritative source of information and advice.

2.5.4.1. The service aims to provide a high quality of service and expertise in relevant areas that will allow it to become nationally recognised and join the Network of Expert Centres\(^v\).

Supporting activities:
- RDM and DP service developments
- continuous involvement in research projects dealing with technical implementation and development needs
- application for Network of Expert Centre membership
- presentations at regional and national workshops and conferences

2.5.5. **Skills and knowledge**

In support of EPSRC expectations, the RDM Roadmap and the ICT Strategy, the Research Computing Service will actively engage with the University community to promote and disseminate RDM and other relevant skills.

Supporting activities:
- work with CAPOD to develop and deliver staff and student development courses in identified areas of need
- provide internship opportunities for PG-Rs and PG-Ts to obtain experience and relevant transferable skills
- organisation of Research Computing workshops
3. Benefits

The Research Computing Service helps the University realise the following internal benefits:

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<th>When?</th>
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| Near term (up to 5 years) | Researchers     | • Increased visibility and research profiles through data dissemination and subsequent citation and re-use  
• Attracting research income through external trust in the service provided  
• Improve data quality: repetitious handling is (semi-)automated; data is better organized and easier to find; collections and methodologies are not duplicated  
• Get easier access to both raw and processed data they need  
• Build skills in data management that enhance employability  
• Can more easily find and get access to expertise and infrastructure  
• Reduce risk of theft, loss or mis-use of data, and damage to reputation that may result |
| Institution         |                | • Fulfilling organisational mandate(s)  
• Fulfill research grant obligations  
• Support the institutional ability to attract new research funding  
• Secure storage and curation of research data  
• Improve awareness of research practices and opportunities  
• Identify more research outputs, and measure citation/re-use of those outputs  
• Increase compliance with funder and legislative requirements and reduce risk  
• Improve readiness for audits and changes in funding agency requirements |
| IT Services         |                | • Continuity in Service provision throughout the entire research data life-cycle  
• Improve forward planning and seek economies of scale  
• Greater uptake, and more effective use of platforms and facilities  
• Increased awareness of researchers’ needs  
• More streamlined processes for delivering advice, information and support |
| Long term (5 years +) | Researchers     | • Value to current (and future) researchers and students  
• Motivating new research  
• Find new audiences and new collaborators  
• Awareness of available content may halt any re-creation of data sets and encourage enhancement or improvements to those already in existence |
| Institution         |                | • Protecting the University’s intellectual property  
• Verification of research and research integrity  
• Stimulate new networks and collaborations (research, research platforms, and professional communities of practice)  
• Increase funding opportunities |
| IT Services         |                | • Sustainability through sharing of expertise, community-building and re-use of infrastructure |

In addition to the internal benefits outlined above, the Research Computing Service assists in delivering these external benefits:

- Use of electronic research outcomes by new audiences, repurposing methodologies
- Contribution to the St Andrews experience in terms of outreach to the wider local, national, and international communities around the University of St Andrews
- As additional electronic research outputs are made available, more value can be derived by larger audiences
4. Testimonials

... from researchers:

"I can affirm without hesitation that the support you have provided at a range of levels has been by far the most valuable that has been available to me. Indeed, your expertise on the technical aspects of these applications has been just a starting point for your involvement, since the experience that you have built up as a technical reviewer for the AHRC has meant that you have been able to provide inputs in a variety of ways."

"Thanks a million, we owe you a great debt."

"I can't tell you how grateful I am to you & Swithun for your continued support for this project. In fact I was thinking about it yesterday and really you have helped make it a much better project!"

"It was so kind of you to give me so much of your time. I really appreciate it, even if I feel rather overawed at how much there is to learn. ... You seemed to go off with rather a long list of 'things to do' - I hope you don't come to regret your generous offer of help."

"IT Services are important, and of course there are rare breeds like Birgit and Swithun who are academics, even humanities people and then went into this, which is great, but that's not the norm I would find it very difficult to find people like that."

"Thank you again for ALL your time, effort, patience and willingness to help the network. I really appreciate it."

... from student interns

"I've really enjoyed working with Birgit and Swithun ... on what has been an incredibly rewarding project. Unfortunately I graduate this June, so will not be able to carry on doing what has been an absolute pleasure to be involved with. ... It is my intention to further my academic career after graduating, with a view to potentially working in arts computing specifically. With this regard therefore, the scheme has been fundamental in informing my knowledge of the area, and indeed introducing me to IT skills I never thought I'd get the hang of, nor be able to utilise confidently and successfully."

"It has been an honour and a very positive learning experience working with you on this project. I wish you success in implementing the RDM within the university in the nearest future. Thank you for a rare opportunity."

... from AHRC reviewers

"The IT people will be very important in this project, and I don't know them, but certainly the on-line databases provided by St Andrews which I have used are reliable both technically and intellectually. It seems safe to assume, therefore, that this side of things will also be successful."

"It is good to see the technical work being carried out in the context of an institutional commitment to the digital humanities, as evidenced by the University's Arts Research and Teaching Server and the support of the university's Research Computing Team."

"This is an exceptionally well written proposal, setting out its general goals with clarity. The applicant gives confidence at every level, presenting few issues for thought or clarification. The digital outcomes are well defined, and supported by relevant resources and management. This is likely to produce a very successful resource, with usefulness to scholars and the general public alike."

"Here - in the details of the technical appendices and in the timetable spread sheet, for example - the proposal speaks eloquently and lucidly for itself. There is little room to doubt the feasibility of the project nor its successful completion on time."
"The database will be valuable for subsequent scholars in a number of fields; the longer-term management arrangements seem adequate."

5. Endnotes


vi See: http://www.datasealofapproval.org/ (It is under discussion to make DSA certification the entry-level requirement for European funding for research infrastructure projects.)


viii An overview of IMIS is available from: http://www.itgovernance.co.uk/iso27001.aspx

ix RCUK Common Principles on Data Policy: http://www.rcuk.ac.uk/research/Pages/DataPolicy.aspx

x EPSRC Policy Framework on Research Data: http://www.epsrc.ac.uk/about/standards/researchdata/Pages/default.aspx

xi See: http://www.dcc.ac.uk. For a schematic overview of DCC Lifecycle Model see: http://www.dcc.ac.uk/resources/curation-lifecycle-model


xiii For details on DAF, please see: http://www.dcc.ac.uk/resources/repository-audit-and-assessment/data-asset-framework

xiv For more information on CARDIO see: http://cardio.dcc.ac.uk/

xv See: http://www.arts-humanities.net/noc