

ARDC Institutional Underpinnings

Element: Culture Change

30/03/2022

CONTENTS

EXECUTIVE SUMMARY	1
DESCRIPTION OF THE ELEMENT	2
DIFFERENCES IN APPROACH AND NEED	4
RECOMMENDATIONS AND ADVICE	6
Understand current and target states	6
Developing a Change Strategy	9
Applied Advice	15
WORKING GROUP ACKNOWLEDGEMENTS	22
APPENDIX 1: COMMENTS ON CULTURE CHANGE MODELS	23
APPENDIX 2: UNIVERSITY EXAMPLES	25

EXECUTIVE SUMMARY

Institutional Underpinnings is part of the ARDC's National Data Assets Initiative. In this program, 25 Australian universities are collaboratively developing a national Institutional Research Data Management (RDM) Framework. This Framework is intended to inform institutions' design of policy, procedures, infrastructure and services, and improve coordination of RDM within and between institutions. This output describes the initial outputs of the research data management Culture Change element of the Framework, providing institutions with guidance on approaches to the culture change. Culture change is required for researchers to adopt related institutional changes and best practice in research data management, thereby protecting from acknowledged risks such as litigation, fines and reputational

damage. The output recommends institutions carry out a stocktake of the current research data management state at an institution and develop a strategic roadmap to map this to a desired future state. The output provides detailed advice on how to track and monitor the change and any risks associated with this. Advice is also provided on the resourcing and communications required for successful cultural change, including staff training opportunities and incentives for behaviour change. Recommendations for institutions and Calls to action are highlighted throughout the Element. Calls to action specifically identify the need for future collective action from institutions and the community. This initial RDM Framework Culture Change output will be further developed through additional institutional consultation and will be complemented by activities to validate and test the outputs described within.

DESCRIPTION OF THE ELEMENT

“Behavior change is hard. Whatever its faults, the status quo is familiar and the warts are known. The status quo is also easy to maintain. Just do nothing, inertia takes care of everything. We even have a tendency to defend the status quo. We’d rather believe that the way it is, is the way it should be.”

- Brian Nosek, Center for Open Science, 2019

Many universities find themselves in a position where the Research Data Management (RDM) status quo is less than optimal. Current practice might not comply with legal or ethical requirements, thus exposing institutions to legal, financial, or reputational risk. It may not conform with the expectations of publishers or funders, limiting the ability of researchers to compete in those arenas and endangering the institution’s standing. Or, researchers may rely on RDM approaches that are inefficient or error-prone, reducing the power, integrity, scalability, and impact of research. Modern, good-practice approaches to RDM are a necessary (if not sufficient) condition for fostering trust in research, whether by addressing the ‘reproducibility crisis’ evident in some disciplines or by simply improving the transparency of research, opening it to scrutiny and verification.

Such practices are not, however, often a high priority for researchers themselves, when placed amongst many professional and institutional obligations and demands. Without intervention, therefore, the status quo at an organisation is unlikely to change. Since people are part of social and cultural systems, considering this widespread change in practice or behaviour as ‘culture change’ is useful. Cultural systems set norms, provide incentives, and impose requirements, giving organisations tools for changing behaviour¹. Culture change and supporting areas like risk assessment and change management are mature domains, providing literature and examples that universities can use to think about and effect change.

¹ Nosek, Brian (2019) Strategy for Culture Change, Centre for Open Science, web log post 11 June 2019, viewed 26 May 2021, <https://www.cos.io/blog/strategy-for-culture-change>

Academic institutions are experiencing a difficult financial climate resulting in reduced personnel and roles being merged, so capacity is limited for dedicated culture change work to be done without additional staff. Important and necessary changes need appropriate funding and resourcing to ensure that they can achieve intended outcomes. In terms of culture change around RDM, institutions are exposed to real and potentially unnecessary risks which include litigation, fines and reputation damage. At risk is also the more subtle reputational damage of obsolete practices and infrastructure which may undermine an external partner's trust in the institution.

This document introduces approaches to culture change at universities in the context of RDM - approaches that universities may be able to adapt to their local context, recognising that research cultures, maturity levels, resourcing, degree of centralisation, and other institutional characteristics vary greatly amongst Australian universities. Subjects covered include broader approaches to culture change, narrower supporting approaches like risk assessment and change management, as well as more specific advice on practical topics like research engagement, community building, and communications planning. It provides a brief review of key literature and examples. Individual ability and motivation, and alignment of organisational culture towards the desired change, are both discussed.

A note on language: terminology around change includes culture change, organisational change, behavioural change, and change management. Often, the first three focus on strategic elements of change, while change management is tactical. This document primarily uses 'culture change' terminology.

Discussions on Culture Change

The Institutional Underpinnings program has identified several components which come from the early participant workshops, feedback and review by participating institutions:

1. **Required culture change for researchers and research teams** - aspects such as awareness; better project budgeting, planning and implementing RDM; records and documentation; compliance checks; developing protocols; and leadership, especially in open research
2. **Required culture change for organisations** - aspects such as governance and a more policy-driven approach; clarified institutional roles; advocacy; clearer communication for example at induction, grant touch points, at promotion; compliance tracking with systems and procedures; providing central consultancy; planning and explicit commitment to foster open research; changing business as usual
3. **Embedding culture changes through training and onboarding** - including both training programs provided to all staff and students; communities of practice; and champions
4. **Networks and communities** - including local & national; research champions; institutions sharing best practice, exemplars and evaluation measures

5. **Culture change for funding bodies** - who are in a strong position to demand greater commitment to and compliance; clear direction on their requirements for RDM; advocacy for grants cost to cover RDM

The focus here is on the first two components, with the following two thought to be better incorporated as practical advice on how to achieve culture change. The fifth is not a focus due to two considerations: uncertainty around the level of impact that might be achieved in the timeframe, and that funder concerns are potentially complex.

DIFFERENCES IN APPROACH AND NEED

Culture Change and Change Management

When embarking on any new RDM initiative, large or small, careful consideration for the level of culture change required is essential. It is important to understand that facilitating change is often a complex matter requiring the development and execution of a carefully planned culture change strategy. That strategy needs to consider a range of key factors including the current state, the desired target state, key stakeholders, factors likely to impede culture change and the application of an appropriate change management methodology.

Change management can at times be confused and/or conflated with culture change. However, the distinction is important. Change management can assist with driving culture change, but it would generally be part of the broader culture change strategy.

Defining Culture Change Success

To be able to say that a culture change process has been successful, the desired future state needs to be articulated by the institution and measures of success clearly defined. This means that processes to track changes in culture (e.g. behaviours, attitudes and outcomes) over time need to be put into place at the beginning of the change process to collect meaningful data, and measurable final state goals are defined. Tracking changes by collecting data along the way, then analysing and interpreting trends in the data will help leaders determine if the changes are leading the institution in the desired direction. If not, course corrections will need to be made to address and potentially redirect efforts to complement new learnings and behaviour.

Different Cultural Approaches for Different Demographics

A successful cultural change plan needs to take into account the varying demographics and thus motivations of cohorts.

One large factor that will affect behaviour is the stage of career a researcher is in. Institute directors will have varying motivations, quite different to higher degree research (HDR) candidates for example. Institute directors will be focusing on areas such as risk management of data breaches, audit information and predicting data infrastructure needs. Alternatively, HDR students will be more focused on learning what research resources are available to them to meet the needs of their projects, 'future proofing' their careers, and might appreciate a more structured or guided data management plan compared to a senior researcher.

Additionally, some disciplines will have differing needs. Research by Akers and Doty² found significant variability in RDM practices, attitudes, needs and interest in support services within and between disciplines. Health and medical researchers for example are going to have many questions around handling [sensitive data](#) and appreciate guidance around secure storage and sharing. Alternatively, creative art researchers will be more focused on openly publishing their work, but with proper copyright and intellectual property (IP) acknowledgement support.

The Culture of Institutional Support and Professional Staff Networks

To effectively implement culture change it is vital to have support and professional staff engage with the process. Professional staff can provide the support, guidance and training necessary to engage and enable researchers in their RDM. Relevant professional staff should be involved or enlisted in collaboration and capacity building activities in an early phase of culture change. Consider that their involvement in collaboration and capacity building may need to be enabled with skills development in RDM or culture change. Investment in ongoing education and skills development for professional staff can be essential to both grow and uplift their knowledge and expertise, both to provide support and drive change.

Engaging professional staff can have long lasting effects and the potential to deepen institutional change and adoption beyond the timelines of implementation initiatives or projects.

Calls to Action: Institutions are encouraged to share with one another case studies and examples of culture change. Consider including the following:

- What models are you using to inform RDM culture change at your organisation?

² Akers, K & Doty, J. (2013). Disciplinary differences in faculty research data management practices and perspectives. International Journal of Digital Curation. 8. 5-26. <https://doi.org/10.2218/ijdc.v8i2.263>

- How did your organisation assess the current state and target state? Did you have experiences with RISE, generic analyses like SWOT, or other approaches? How effective were they?
- How did your organisation approach the assessment, articulation, and management of risk related to institutional RDM? Who did you consult when assessing and developing strategies for managing risk? What risks and potential harms related to RDM did you identify?
- How did you generate buy-in from university leaders? How did such buy-in help your culture change initiative?
- How did you manage the resourcing of your culture change initiative?
- What rewards and incentives have you implemented?
- Did you find it helpful to have working definitions of particular terms at your organisation? Terms and concepts related to change at organisations can be confusing to newcomers. What terms and concepts should be better defined in this document?
- Does your institution benchmark against (inter)national good practice, and if so, how?
- How does your organisation monitor the progress of cultural change? Does it differ from your initial stocktaking, or is it an extension of those activities?
- How has your organisation solicited feedback? What combination of surveys, interviews, and other approaches worked for you? What other information or metrics have you used to assess the progress of change?
- How has your organisation acted on feedback during a change process? How did you communicate those actions?

RECOMMENDATIONS AND ADVICE

It is important to articulate (1) the current state of practice, behaviour, and culture, (2) the target state, and (3) a change strategy mapping a pathway from current state to target state. Defining the target state, and prioritising aspects of it in the pathway or change plan, will also benefit from an articulation of risks and benefits, including the organisation's sensitivity to risk.

Understand current and target states

Undertaking organisational change benefits from a clear roadmap. This allows organisations to plan the path of how to move from the former state to the latter. Without clear articulation of either the start or end point, it will be more difficult to plan change or to convince stakeholders that change is needed.

The Current State

It is important to conduct a stock take of the current state for an institution to understand what challenges they will face when trying to change the culture around RDM. This stocktake should aim to understand the current cultural practices around RDM, as well as the infrastructure, processes, and services that support best practices in RDM. An institution's appetite for change will be influenced by the fall out of past events (e.g. recent change processes which may have led to change fatigue), current

pressures that might reduce or limit workload capacity associated with change (e.g. changes to staffing, or workload models), and inevitably the funds available.

A number of approaches and tools can be used during an institutional stocktaking to assess the current state. Approaches aimed at institutional RDM include the Digital Curation Centre's Research Infrastructure Self Evaluation (RISE) Framework³ amongst others (cited and compared on the RISE website). RISE offers a way for organisations to evaluate 'readiness levels' for various aspects of institutional RDM. General-purpose approaches to current-state assessment are also commonly used in institution settings, such as Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. Organisations may need to employ some combination of RDM-specific and general-purpose approaches to characterise various aspects of their current state.

The information needed to define the current state can be gathered through surveys, interviews, or focus groups, sometimes used in combination. Feedback indicates that interviews might be more useful than surveys, as problems or strengths can emerge more fully through a long-form interactive discussion. Some existing metrics, such as the number of datasets in an institutional data repository, might also be useful. When interviewing or surveying staff, it can be useful to include a range of stakeholders, including institution leadership and research support staff, in addition to researchers. Potential measures of success to monitor can be found below, in the section Continual Assessment.

RDM-specific and generic approaches to assessing the current state will also likely point towards desired target states (e.g., 'we should eliminate this threat', 'we should pursue this opportunity', or 'we should raise this maturity/readiness level'). A target state can also be informed by problems and opportunities identified from surveys, interviews, focus groups, or metrics. Discussions with institution leadership are likely to be important to define the target state and promote buy-in to that vision of the future.

Note that, as with other types of technology-related business analysis, a tendency exists for users or clients (researchers, in this case) to articulate solutions before clearly defining problems (e.g., 'I need a larger network-attached storage device' rather than 'I have 10 terabytes of data and no place to store it'). Experience suggests directing survey respondents, focus group participants, and interviewees towards problem definition before discussing solutions.

With the current state documented, the gap between the desired target state and the current state can be better articulated, and a clear path can be mapped between them. Leaders must take the opportunity to communicate the vision, strategic goals, and motivation (e.g. risks and benefits) to ensure buy-in from the beginning, but with a sound understanding of the current state.

Recommendation 1: Understand the current institutional RDM state

³ [Using RISE, the Research Infrastructure Self Evaluation Framework | DCC](#)

The Target State

Once a current state is understood, a culture change strategy takes into account the current culture and the methods to bring positive change into the culture space. Aiming for a staged approach, with your 'low hanging fruit' first in line, has merit. Approaches that can be implemented leveraging existing infrastructure can provide early successes that contribute to sustaining momentum toward the objective of cultural change. Additionally, a staged approach can assist with limited resourcing. An important consideration is an evidenced acknowledgement of the resourcing required for an approach to be successful. In the current climate where workloads are already heavy and resources tight, there is a real risk of increased workloads with new tasks relating to RDM, that inadequately address current workloads and risk partial implementation and loss of momentum. It is important to highlight implementation as distinct from adoption, with adoption being the end goal. Proper communications planning and cultural adaptation need to happen to get the push from 'implementation' to 'adoption'.

For researchers, incentives need to be clear and well communicated, as does the need for risk management and compliance. Policy agendas and/or the rationale for change objectives should be communicated. With threats of data breaches, auditing needs and future technical resource budgets all weighing on universities, there is merit in top-down support driven by leadership who have an understanding of the effects of these external pressures. Additionally, finding benefits, reward mechanisms for researchers, and highlighting the value of RDM planning are essential. There is value to engaging compliance, for example asking researchers to estimate how much storage they will need, also beneficial to understanding technical budget estimates for future years.

One of the most valuable tools for identifying a desired target state is likely to be benchmarking against other organisations, within Australia or overseas, and seeking other external sources for good practice in institutional RDM. It is likely that your organisation can find another organisation with a solution to problems you are facing. Much can be learned by reviewing university research technology web pages, and meetings can often be arranged with research technology or research data staff. Attending events and reading outputs from national and international organisations such as the ARDC, Research Data Alliance (RDA), the Center for Open Science (COS), the Committee on Data for Science and Technology (CODATA), the Digital Curation Centre (DCC), and others is essential. Familiarity with statements or manifestos about RDM can also inform development of target states, especially if they are endorsed by funders, publishers, or other relevant organisations. Finally, when defining the target state, convincing stakeholders that the changes are necessary requires articulating current-state risks and target-state benefits. Experience at many Australian universities has shown that articulating of risk in particular has been crucial to convincing stakeholders of the need to change and securing the resources necessary to drive change. As such, a section on 'Risk Management and Quality Assurance' has been included below.

Developing a Change Strategy

Once an organisation articulates current and target states, a pathway can be mapped that guides how an organisation and its staff will move from the current state to the target state. Producing this roadmap is perhaps the core activity in developing a behaviour or culture change strategy. Culture change is a mature field; this brief introduction seeks to provide an orientation to it.

Broadly speaking, culture or behavioural change has two components. Most culture change literature focuses on individuals' ability and willingness to adopt new behaviours or practices (see '[Appendix 1: Comments on Culture Change Models](#)' below). Nosek, writing about culture change in a research context, however, takes for granted that researchers want to, and can, 'do the right thing', and instead focuses on institutional culture, including norms, incentives, and requirements. At most universities, changing RDM practice is likely to require both of these components. Individual researchers must be convinced to adopt better practice and trained to implement it. Universities also need to ensure that better practice is not only as easy as possible, but also normative, rewarding and, at least in some cases, mandated.

Change leaders will determine the philosophy behind the change approach. Will it focus on the institution, assuming that an organisation's members are ready and willing to change (e.g., Nosek 2019), or will it assume that staff need to be persuaded and educated (most other change models, cf. Kubler-Ross⁴ below)? Will change use evidence to persuade people to choose change (as in 'Nudge theory'⁵)? Will it focus on supporting staff on their emotional journey through the change process, as with the Satir change model⁶ or the Kubler-Ross change curve? Or will it be driven from the top down, perhaps with required training and penalties (an approach criticised by Dobbin and Kalev 2016⁷)? Many guides to common change management models can be found online; two concise places to start are Mulholland 2017⁴ and Lucid Content Team 2021d⁸. A brief overview of several models is also provided at the end of this document under '[Appendix 1: Comments on Culture Change Models](#)'.

Recommendation 2: Understand the desired future institutional RDM state, develop a strategy to achieving this and regularly monitor progress towards this

Moving from Current to Target State

Once a strategy for change has been decided upon, the process of culture change can begin. The 'Applied Advice' section below includes discussion of some of the key activities often used to drive

⁴ <https://www.ekrfoundation.org/5-stages-of-grief/change-curve/>

⁵ Mulholland, Ben (2017) 8 Critical Change Management Models to Evolve and Survive, Process Street, web log post, 24 July 2017, viewed 9 June 2020, <https://www.process.st/change-management-models/>

⁶ [The Satir Change Model](#)

⁷ Dobbin, Frank & Kalev, Alexandra (2016) Why Diversity Programs Fail: And what works better. *Harvard Business Review*, Human Resource Management section, web log July-August 2016, viewed 14 September 2021, [Why Diversity Programs Fail](#)

⁸ Lucid Content Team (2021d) 7 Fundamental Change Management Models, *Lucidchart*, web log post, viewed 23 June 2021, <https://www.lucidchart.com/blog/7-fundamental-change-management-models>

culture change, some of which are discussed in more detail in other Institutional Underpinning elements, especially [‘Support, Training, and Guidance’](#) and [‘Policy’](#). The change models introduced above also deal with the process of change. Finally, particular strategies for change will vary according to local circumstances.

Continual Assessment

To ensure success, ongoing monitoring of long term changes in behaviour is needed to assess if adopted approaches are successful. Monitoring progress ensures that the interventions around infrastructure, policies, processes, outreach, training, support, and other areas are producing the desired results. Regularly soliciting feedback, acquiring relevant metrics or other indicators (eg. service uptake, enquiries, training attendance) , and evaluating progress during a change process reveals the course of change, providing early indications about whether or not the organisation is progressing towards the desired target state. This information can indicate when change-related activities are not working effectively, so that mid-course corrections can be undertaken. Taken early, such adjustments to the change process can be modest and incremental, limiting disruption and building confidence amongst stakeholders, who will appreciate that change activities are being monitored and that any adjustments are considered and deliberate (especially important considering the stress inherent to times of change). In addition to identifying flaws in the change strategy and informing the adjustment of interventions, soliciting feedback and evaluating progress can also reveal unforeseen barriers to change, again allowing informed and deliberate adjustments to the change process. Many of the change models presented below under [‘Appendix 1: Comments on Culture Change Models’](#) incorporate or assume a degree of feedback from stakeholders, perhaps most explicitly in the ‘Check’ phase of the ‘Plan, Do, Check, Act’ (PDCA) model⁹. While monitoring progress, however, it is important to bear in mind that changes in productivity or outcomes will not likely rise along a smooth upwards trajectory. Some change models (e.g. Satir¹⁰ or Kubler-Ross¹¹), recognise that productivity may initially decline as time, energy, and resources are directed away from usual activities toward the process of change itself (and its ancillary emotional and organisational effects).

Potential assessment measures include:

- Training attendance
 - Monitoring attendance numbers if training is non-mandatory. A measure of HDR students versus academics and disciplines can also highlight changing attitudes in particular cohorts. Percentage of researchers who have completed online relevant RDM training can also be a measure

⁹Lucid Content Team (2021b) How to apply the Plan-Do-Check-Act (PDCA) model to improve your business, Lucidchart, web log post, viewed 23 June 2021, <https://www.lucidchart.com/blog/plan-do-check-act-cycle>

¹⁰ <https://stevenmsmith.com/ar-satir-change-model/>

¹¹ <https://www.ekrfoundation.org/5-stages-of-grief/change-curve/>

- Teachers for these workshops can indicate attitudes, number and nature of questions, and participation levels for guidance (could be more relevant for mandatory workshops)
- Relevant workshops would include any around research data, sensitive data and storage.
- Storage requests
 - Number of storage requests and size of storage allocations
 - File activity and movement between storage and RDM systems, for example inactive files on active research data management systems, or lack of movement of files into research data repositories.
 - File activity and movement between storage and RDM systems, for example inactive files on active research data management systems, or lack of movement of files into research data repositories.
 - Requests may provide evidence of changes in data management practice, for example storage requests for individuals versus requests for project or collaborative groups. Patterns of unusual requests may identify unmet needs, for example cybersecurity concerns.
- Data Management Plans (DMPs)
 - Proportion of researchers and research groups that have submitted a DMP
 - Updating of DMPs after initial submission
 - Comparison of successful grants against DMP submissions
 - Number of non-mandatory DMPs submitted
- IT processes in place
 - Viewer counts and clicked links to RDM related webpages
 - Number of helpdesk requests recorded for RDM consultations
- Publications
 - Number of successful grants that are completed or nearing completion which have associated metadata in a data repository
 - Number of researchers using ORCID identifiers associated with their research outputs
 - Proportion of publications in Open Research Journals
 - Citation metrics on re-use for published datasets
- Surveys
 - Longitudinal surveys and interviews to gauge attitudes and practices.

Soliciting, evaluating, and acting on feedback

The process of soliciting feedback from researchers, research support staff, and other stakeholders, and then evaluating and acting on that feedback is, furthermore, a valuable part of the change process in and of itself. Sincere investigation of the impact of change-related activities, and reactions to it, is crucial to generate stakeholder buy-in. If leaders fail to listen to or address the concerns of people affected by

the culture changes, it may lead to resentment and reluctance to adopt new processes and behaviours (e.g., Dobbin and Kalev 2016¹²).

Acquiring meaningful feedback from researchers and other stakeholders requires an intentional feedback approach. Vehicles for feedback may resemble those used in your initial stocktaking (see above), including surveys, focus groups, and longer-form interviews (with similar caveats as to their relative effectiveness). The Carpentries use surveys to assess the short- and long-term impact of Software or Data Carpentry training workshops, for example, that may provide inspiration for the sorts of questions that might be asked of researchers after discrete activities are undertaken¹³. It is likely that consolidation of feedback from multiple sources will be necessary to accurately monitor the change process. Considering the challenge represented by change processes, and that resistance to change is inevitable, feedback should be assessed carefully, with some expectation for negativity even when the process is going well. Comparing feedback from different sources - e.g., research support staff in Ethics and Integrity, Research Services, IT, or the Library, may offer perspectives to contextualise feedback from researchers (e.g., Integrity Officers may see improvements in ethics applications and a reduction in risk, or Grant Officers may see improvements in funding applications and higher success rates, even as researchers complain about new requirements). Cross-checking against other metrics related to compliance (e.g., via audits of data practice or tracking the number of data-related breaches) or improved practice (e.g., tracking the number of published datasets or articles published in journals with stringent requirements related to FAIR data or the TOP guidelines) may be valuable. As was the case when a target state was being defined, benchmarking against other organisations is also likely to be helpful (e.g., where 'gaps' are being closed). Combining information from multiple sources is most likely to produce understanding.

Feedback must also be acted upon - and be seen to be acted upon. Actions based on feedback may include modifying the change strategy or process itself, adding new infrastructure, modifying policy, or providing additional training and support. When such changes are made, they should be communicated to stakeholders as a demonstration that the feedback and evaluation process is being undertaken in good faith.

Finally, as part of change assessment, it is important to recognise when the target state has been reached. Change is fatiguing and, in the short term, reduces productivity. Concluding a change process by acknowledging - even celebrating - the fact that a goal has been met, a transition completed, and a new (improved) status quo reached is an important final step in the process.

¹² https://hbr.org/2016/07/why-diversity-programs-fail?utm_medium=social&utm_campaign=hbr&utm_source=twitter&tpcc=orgsocial_edit

¹³ <https://carpentries.org/assessment/>

Risk Management & Quality Assurance

It has been observed that although priorities vary between organisations, risk management and mitigation have often been major drivers of organisational change around RDM at Australian universities. Risk management is a mature field, with its own conceptual frameworks (see Australian Government (2021) Business risks¹⁴). As such, a working knowledge of core risk concepts and terminology can help RDM proponents make a case for needed changes to institutional leadership, and explain the necessity for change to researchers and other stakeholders.

Generally speaking, risk management begins with an assessment process identifying hazards, assessing likelihood, and potential impact and severity. Once risks have been assessed and prioritised, they can be managed to reduce exposure to legal, financial, or reputational damage. The goal of risk management is not necessarily to eliminate all risk, but rather to understand risks and potential impacts, minimise risks to the extent possible, decide what risk an organisation is willing to bear, and develop approaches to manage remaining risks. Finally, since not all risks can be known beforehand, building organisational robustness or ‘antifragility’¹⁵ may also be part of a risk management approach.

Risk management intersects with RDM culture change in two ways. First, risks should be identified and evaluated as part of articulating the current state. And second, a culture that maturely assesses and manages risk, with purpose and self-awareness, should be part of the institutional RDM target state. and risk planning should inform the direction of that culture change. Articulating risks may help convince stakeholders and institution leadership of the need for change and resources to drive the change.

Determining risks, risk tolerance, and risk mitigation measures requires conversations with staff from the various institutional units that support RDM. Such units may include:

- Ethics and Integrity, who can articulate the risk, risk management approaches, and risk tolerance related to research ethics and integrity compliance generally, including human and animal ethics compliance
- IT Security, for risks related to cybersecurity
- The Library, for risk around copyright and reuse
- Research Services, for risks related to funder and publisher compliance, as well as compliance with other governance, such as classified or sensitive information
- Office of General Council, for legal risks related to privacy acts, record acts, data breaches, etc...
- Risk Management, for overall institution risk strategy, and sometimes specialised areas like international (e.g., EU General Data Protection Regulation) compliance
- DVCR for general guidance on risk appetite in relation to research data

¹⁴ <https://business.gov.au/risk-management/risk-assessment-and-planning/business-risks>

¹⁵ Nassim Nicholas Taleb, “Antifragile: Things That Gain From Disorder”, 2012

To begin conversations with these stakeholders, it is useful to have some familiarity with the language of risk management, and an idea of the types of risks associated with RDM at universities. Common risks and associated consequences include:

- Loss of high value or irreplaceable research data
- Non-compliance with privacy laws, which can lead to large fines, and reputational damage in the event of a breach
- Non-compliance with record retention law, which can result in fines, and reputational damage in the event of data loss
- Non-compliance with human ethics or research integrity requirements, which can stop research, render researchers or organisations ineligible to participate in future research in the event of a breach, as well as lead to reputational damage
- Inability to comply, or non-compliance, with funder RDM requirements, which may prevent researchers from applying to certain grant schemes, make their applications uncompetitive or, if a grant is won but requirements are not met, sanctions from funders regarding future eligibility, with downstream effects on research income, ranking, and reputation
- Inability to comply with publisher RDM requirements, which may make it impossible for researchers to publish in certain (often high-impact) outlets, with downstream effects on research income, ranking, and reputation
- An ineffective institutional RDM approach, particularly with respect to infrastructure, training, and support, may also hamper recruitment and retention of research staff

To conclude, identified risks should be included in the current state review of the change strategy. Good practice leading to reduced risk, and better management of residual risk, should be part of the target state. The assessed severity of risks can inform prioritisation of activities during the change process. Ideally, a purposeful approach to risk itself can also be incorporated into the target state.

Generating ‘Buy-In’ from institutional Leadership

It is necessary to generate ‘upward’ buy-in, since successful culture change in large organisations will often, if not always, be driven from the top. The Prosci change management approach in particular calls out the importance of executive level sponsorship¹⁶. Buy-in from institutional leadership helps ensure that the required change is understood to be important, and that the nature of the change is clear across the entire organisation. In the context of RDM, the DVCR (and, to some degree, the VC) often drive change, and need to actively and visibly advocate for the desired changes.

As such, leaders of RDM change initiatives should engage early with the DVCR to ensure that key institution leaders are aware of the initiative, support it, and understand the risks of failure. Institutional

¹⁶ <https://www.prosci.com/resources/articles/primary-sponsors-role-and-importance>

RDM leaders should also be certain that the DVCR clearly understands the importance of supporting, communicating, and promoting the changes that are needed across the institution.

Varying levels of engagement from institutional leadership, as well as differences in effective strategies for engaging leaders have been reported. Language around risk, competitiveness, and the ‘future-proofing’ of research is likely to be important, but different institutional contexts and leadership personalities mean that what combination of these, or other, factors works best will vary from one institution to another. Since this area is both important and difficult, it has been flagged as a particular area of interest for feedback from institutional case studies.

Applied Advice

Engagement

Stakeholder engagement, broadly speaking, is the process by which an organisation involves people who may be affected by the decisions it makes. Methods range on a continuum from communications through to collaboration and participatory co-design. Ensuring inclusivity and diversity in engagement (Dobbin & Kalev 2016¹⁷) enlists managers/leaders in solving the problem, exposes them to different groups, and encourages visibility and discussion. One way to conceptualise building cultural change in RDM, applicable to any element of the framework, would be to consider lenses of engagement:

- ‘Top-down’ – the role that leadership, strategy, policy, funding, rules, frameworks etc play in setting the incentives that shape research culture
- ‘Bottom-up’ – the potential for researchers to make behavioural and attitudinal change at the level of research groups, centres, institutions and how this can form new social norms
- ‘Horizontal’ – professionals from across organisation units who support researchers and data infrastructure may require a different lens and can aid in communications, communities, training and making change easier

When people are forced to change by using rules, compulsory training, and penalties there is usually resistance and the opposite behaviour from that which is intended occurs. This has been demonstrated in the failures to change the behaviour of corporations towards inclusivity and diversity in recruitment and promotion¹⁸. Allowing people to feel that the choice is theirs leads to better outcomes.

Advice to ensure meaningful engagement:

¹⁷ Dobbin, Frank & Kalev, Alexandra (2016) Why Diversity Programs Fail: And what works better. *Harvard Business Review*, Human Resource Management section, web log July-August 2016, viewed 14 September 2021, [Why Diversity Programs Fail](https://hbr.org/2016/07/why-diversity-programs-fail)

¹⁸ Dobbin, Frank & Kalev, Alexandra (2016) Why Diversity Programs Fail: And what works better. *Harvard Business Review*, Human Resource Management section, web log July-August 2016, viewed 14 September 2021, https://hbr.org/2016/07/why-diversity-programs-fail?utm_medium=social&utm_campaign=hbr&utm_source=twitter&tpcc=orgsocial_edit

- Communicate any policy agenda carefully, e.g. the research culture agenda has evolved, the importance of engaging researchers and disciplines, the collective efforts to engender community
- Gather and reflect insights from conference, discussion meetings, and previous communities of practice
- Undertake a user experience survey of key stakeholders to understand gaps, needs and what the community has in common
- Invest in relationship building within the relevant areas of professional services and between professional services and the academic community impacted by the changes.
- Encourage researchers to follow and join broader Communities of Practice such as some facilitated by the ARDC
- Create a RDM working group and recruit champions in academic areas
- Build RDM into an existing “Research Professional Development Framework” if one exists, including linking to research training competencies
- Consider ways for service centres to have open discussion with researchers – build into existing events and activities – open communication with Library, IT, Learning and Teaching and Research Services. This can encourage the breaking down of silo boundaries

The following 3 sections explore interconnected properties of each aspect of engagement.

Engaging Researchers & Disciplines

In the context of RDM, researchers are the key stakeholders. Engaging with researchers is necessary to help achieve buy-in, and is a prerequisite for success of all the aspects of culture change articulated in this element. Engaging with researchers about the risks and benefits of RDM to them, and to the organisation, will enable them to understand the rationale and justification. This leads to better appreciation of the “what” that is required and facilitates researchers partnering in its implementation and adoption. Implementation relies on adoption which relies on buy-in.

Involving researchers is also a two way engagement, providing the ability to acquire a researcher-centric view of service and solution design. Custom RDM solutions that are aligned with researcher perspectives and provide an immediate value to researchers can be designed and implemented, resulting in reduced resistance and increased uptake.

Understanding how different academic disciplines use and engage with RDM will inform and influence how new RDM initiatives are communicated. For example, creative arts researchers are likely to have different needs to genomics researchers, so understanding discipline specific RDM needs can help ensure that those needs are met.

Researcher engagement also assists with the collation of a strong evidence base that can be used to help convince institutional leadership, academic leadership and influencers across the institution to endorse, support and champion RDM culture change.

Practical deeper advice¹⁹

- **Inform the community.** An ingredient for successful engagement is to carefully articulate and communicate the rationale for the objective.
- **Foster “Champions”** - researchers that promote ‘best practice’ - who will ideally need workload allocation and recognition for this role. The four Building Blocks of Change recommend role modelling as one of the four key actions that influence employee mind-sets and behaviour²⁰. Champions and case studies could serve as effective role models for best practice RDM behaviour.
- **Target the discipline-specific resources, examples and case studies.** Two of the five levels of intervention in the Center for Open Science’s strategy for culture change are to ‘make it easy’ and to ‘make it normative’ (Nosek 2019). Discipline specific resources will assist in making best practice easy for researchers, and champions can assist to make it normative.
- **Consult the community.** Ensure broad engagement with researchers and/or research support staff from different academic divisions or representing different RDM workflows. This approach will better identify practices, risks, pain points, and appropriate channels for communication and downstream engagement.
- **Involve and collaborate with academics in the planning and implementation process.** The degree of academic involvement can vary, ranging from an advisory capacity to co-development of solutions and culture change initiatives. The spectrum of participation proposed by the International Association of Public Participation²¹ (IAP2) provides an interesting insight.
- Correlate benefits gained from good RDM with increased research impact where possible. The following article provides an emerging, holistic view of what could constitute research impact²².

Community Building

Arguably, critical to cultural change is the importance of communities of practice. The recent shift to remote working has meant a diminishment of the physical signifiers that would previously more readily support the scaffolding of communities.

Multiple factors make community-building difficult: the turnover of doctoral researchers and research staff alike present challenges for establishing a lasting community culture, variety in the size and structure of institutions means that solutions need to be highly individualised, and community building is both everybody’s and nobody’s responsibility. Everyone has some sense of duty to contribute to a safe

¹⁹ https://iap2.org.au/wp-content/uploads/2020/01/2018_IAP2_Spectrum.pdf

²⁰ Basford, Tessa & Schaninger, Bill (2016) The four building blocks of change, *McKinsey Quarterly*, web log post, 11 April 2016, viewed 10 September 2021, <https://www.mckinsey.com/business-functions/organization/our-insights/the-four-building-blocks-of-change>

²¹ <https://iap2.org.au/resources/spectrum/>

²² Wade Kelly (2019), The Emerging Impact Landscape, The Research Whisperer blog. <https://researchwhisperer.org/2019/05/21/the-emerging-impact-landscape/>

and inclusive community culture, but without delivery falling into a named individual's portfolio, efforts risk being fragmented, duplicated, or missed entirely.

Recommendation 3: Clearly define ownership of community building at the institution

With increasing pressure on professionals supporting researchers to frame their work in terms of longer-term and structural actions that promote a safe research culture, the community-building activities that were once a nice-to-have are now fundamental. This is not to say that individual community-focused interventions will, on their own, transform research culture, but the sum of different kinds of support can have a transformative effect on how researchers experience that culture.

Communications Planning

A well designed and executed communications (Comms) plan is critical to the success of any organisational change program or initiative. Comms need to be designed to flow downward, upwards and sideways within the organisation. Comms plans are a centre piece to all widely used change frameworks and exist to ensure that all participants in a given activity understand the reasons for the proposed change, and what is expected of them in terms of learning and complying with new procedures or systems. Participants in change also include support professionals, so articulating what messages or changes are expected of them is also important.

Recommendation 4: Advice for a coherent approach, consistent messaging:

- Carefully communicate policy agendas and/or the rationale for the objectives
- Develop a terms of reference for a working group to be created and seek endorsement from the top
- Agreed on a communications plan to execute and the key people needed to implement it
- Leverage multiple communication methods and technologies including both “push” methods (bulk communications, eg. email, staff news) and “pull” methods (requiring opt-in, recipient discretion, eg. web resources, blogs, subscription lists). A variety of text and multimedia modes will also help ensure that messages are effectively communicated
- Share and articulate the objectives, strategy and plan for awareness raising
- Encourage research leaders and mentors to lead RDM practices and related discussions among the research team
- Encourage research leaders and mentors to lead both education and compliance within their discipline and/or Schools
- Provide a marketing toolkit to aid in any communications. This could include reusable collateral such as slides with embedded consistent messages. Messages should succinctly outline the most important calls to action, the reasons, and potentially risks or benefits that resonate
- Build communications into inductions and orientation of new staff, both researchers and research professionals
- Incorporate meaningful “carrots” into the communications plan. For example, at ECU and Bond University, upon completion of a Data Management Plan (DMP), data storage an instance of SharePoint is auto-generated for researchers
- Leverage existing communication events and outreach opportunities, such as researcher forums and department research meetings. Change fatigue and workload constraints can mean researchers choose what they will get the most value from, so ideally bring the communications to them

- Communications plans should consider post-initiative/post-project engagement strategies which may involve broader staff to sustain and continue the culture change. Consider communicating and setting these expectations with staff, especially articulating what messaging or communications changes are expected of in the long term

(Significant contributions from this section reference presentations from “Vitae Connections Week 2021”²³)

Resourcing & Support

An acknowledgement of resourcing is required for an approach to be successful. In the current climate workloads are already heavy and resources tight, so any changes, increased workloads, or new tasks relating to RDM will be inadequate alone. The real risk is partial implementation, loss of momentum and consequently, inadequate institutional RDM.

Minimum resourcing recommendations are difficult to provide, but dedicated time is required to develop the strategy, governance, coordination and to meaningfully engage all participants in the change. A staged approach can assist in circumstances with limited resourcing. Opportunities to dedicate existing advocates and change activities may be possible.

Resourcing advice:

- Employ people with experience in and knowledge of managing culture change
- Desirable skills, or resources that should be available to your culture change initiative include: experience in designing policy, resources and tools; experience in seeking out appropriate platforms to endorse, promote and support; training design and digital literacy training

Leveraging existing skills and staff

Skilled research support staff can be found in a variety of roles across most institutions, and some consider RDM a part of their expertise or role. This can range from provision of RDM services, to advising on specific domain platforms or situations (eg. ethics, contracts). At a minimum, staff providing tier 0 through tier 2 support might also recommend researchers use services or engage in initiatives. Informing research support staff in culture change initiatives can increase general awareness and broaden uptake of RDM benefits. Broader support staff can be leveraged to support culture change initiatives, either as formally seconded resources, or by informally managing their involvement. This comes at a cost, potentially in salary, management overhead or the effort required to gain support from their line management. But in circumstances where centrally managed culture change is insufficiently resourced to engage many researchers and many disciplines, enlisting broader support staff can make a large difference. Support staff can also provide deeper access to their existing client bases. And this has the potential to further embed the institutional culture change required, across organisation units, beyond structural changes, or beyond the end of funded initiatives/projects. Some models for this include:

²³ <https://connectionsweek2021.vitae.ac.uk/agenda>

- Building an informal culture change working team across organisation units, usually led by a dedicated role or initiative
- Leveraging experts on a per project or activity basis
- Involvement in and running communities of practice

Appropriate Training

As indicated in other essential properties, providing the ‘what/why/how’ for RDM is essential for change. The responsibility of the institution to provide [guidance in the form of training](#) is widely understood and is accepted as a foundational activity to provide those important change messages. Additionally, having executive support to instigate mandatory training can further set the cultural attitude of the institution around the importance of RDM.

General high-level advice to be considered when planning training:

- Ensure resources and materials are tightly linked with consistent messaging from any communications plans
- Career stage specific training or professional development needs to be taken into account (HDR Students vs Post-Doc)
- Availability of training that is timely to research or HDR project lifecycle. Early intervention is better than retrofitting, but retrofitting is better than no change
- Ensuring clear pathways to next steps post-training is important, eg. further training and guidance. Ensure that training reinforces where to find up-to-date support documentation, services and personnel

Making Change Easy and Possible

If change is not made easy then only highly motivated people will make the effort to learn new systems, new processes and enact these new behaviours to become habits. Remove barriers to the new processes and behaviours, and people should only need convincing and upskilling.

General high-level advice:

- Within initiatives, improvement works and project planning, prioritise the ease of use of systems, integration and processes, ideally that will step researchers through decisions and considerations. Ease-of-use can be prioritised in activity principles, goals, user-experience resourcing and specific activities such as user-engaged co-design and testing
- Within initiatives, improvement works and project planning, prioritise and test for systems and processes that work together to funnel behaviour in the desired direction
- Make options clear and easy to decide - provide frameworks for decision making
- Try to have options for the majority of use cases, eg. storage types, sizes, tools for data capture, [sensitive data](#). Without sufficient infrastructure and support options, change may not be possible

- Draw on data from other enterprise systems, or consider reducing collected information that can be obtained from other enterprise systems. Minimum information may be required in order to refer to specific information in another system (eg. grants, ethics, DMPs), but test that it's reasonable for researchers to have this minimum information (eg. specific IDs). Reducing the need for researchers to provide the same information to multiple systems can facilitate processes, reduce error and reduce the amount of information that needs to be kept up to date. (e.g. allocation of storage space, registration of datasets)
- Utilise Journey Mapping²⁴ to ensure that the process researchers are being asked to follow is as simple as possible, that it makes sense, and that appropriate scaffolding is built in at the right places to help researchers with different levels of experience through the required steps

Rewards and Incentives

As of 2021 the majority of academic institutions in Australia do not reward research data practices, including [Open Research](#) and FAIR data practices. Academic career advancement is dependent on the number of high impact publications, and the number of citations. This 'publish or perish' culture has resulted in selective reporting of research outputs towards positive trends and 'tidy' stories to enable publication. For researcher behaviour to change towards Open Research and FAIR data, the culture and the system supporting researchers needs to change to enable and reward FAIR data and Open Research behaviours. Rewards are one way to incentivise change. By acknowledging changes in researcher behaviours and processes, and rewarding those that align with the goals of the desired future state, people can be motivated to keep going in the desired direction. Providing incentives and rewards for desired behaviours creates a positive feedback loop.

The following suggestions for meaningful rewards and incentives can be used to recognise the desired changes in behaviours relating to RDM:

- **Workload models** which appropriately acknowledge the necessary training time for researchers to upskill (e.g. to become digitally literate, to learn how to use appropriate platforms, to learn how to publish data with discipline specific metadata, to transfer/deposit data from active storage to archive/repository, to appropriately document and annotate data, etc.) and the additional time it will take to make data FAIR and publish Open Research
- **Promotion criteria** that acknowledge some best practices in RDM in academic promotions processes (e.g. data publications, service roles such as a Data Champion, publications in journals that require FAIR data and Open Research to be a consideration or ranked highly due to transparency and reproducibility, funding secured from organisations which require FAIR data and Open Research to be a consideration or ranked highly)

²⁴ Atlassian Team Playbook, Customer Journey Mapping [Customer Journey Mapping | A Step by Step Guide | Atlassian Team Playbook/](#)

- **Professional development review** : include in this annual process a section where staff can plan the incorporation of RDM best practices, review their progress and training needs. A dedicated RDM section would actively encourage researchers (by showing it as an expectation of managers) to develop skills and practice in this area over the following year (e.g. training in RDM, upskill in digital literacy, publish in a journal that supports Open Research, or publish a data set in a discipline specific research data repository with using discipline specific metadata standards)
- **Position descriptions / selection criteria** that acknowledge skills and experiences in best practices in RDM at all levels
- **Institutional research grants and funds** can require best practices in RDM or at a minimum a DMP. Or even further, recognising “research data” as an institutional grant category (either specifically or as part of a grant) to encourage some applicants to include a focus on establishing significant research data or databases or data publishing. A data focus can be valuable for grants involving infrastructure or for ARC (LIEF) near-miss. A further incentive might be the institution co-contributing to successful applicants an RDM specialist and infrastructure support for the project.
- **Career pathways** for those who display best practices in RDM (e.g. for someone who is a Data Champion in their Department and has mentored/advised/trained other researchers in best practices perhaps pathways to Data Steward/Architect roles, and more academic type positions)
- **Annual awards** that acknowledge excellence in research data and best practices in RDM (e.g. VC awards, such as in learning and teaching, potentially expanded to include research data and RDM)
- **Institutional researcher profiles** incorporate information about research datasets and published data outputs (eg. in PURE, Symplectic Elements). The datasets will be more discoverable, but it also makes the publishing of datasets at the institution more obvious (datasets could be the result of FAIR data initiatives, Open Research funding, journals conforming to Transparency and Openness Promotion guidelines²⁵)

WORKING GROUP ACKNOWLEDGEMENTS

Lyle Winton (Chair)	ARDC
Shawn Ross (Editorial Committee)	Macquarie University
Willo Boniface	University of Wollongong
Fiona Bradley	University of New South Wales
Cheryl Claridge	Federation University
Kim D'Costa	University of Melbourne
Marc Fellman	Edith Cowan University
Paul Hardaker	Western Sydney University

²⁵ <https://www.cos.io/our-services/top-guidelines>

Caroline Lobell	Bond University
Katherine McClellan	Macquarie University
Amanda Miotto	Griffith University
Les Mitchell	University of Southern Queensland
Katherine Shaw	University of Tasmania
Jake Surman	University of New South Wales
Julie Toohey	Griffith University
Rob Watson	Federation University
Jaye Weatherburn	University of Melbourne

The outputs of this working group were edited for public release by Frankie Stevens, Lyle Winton and Nichola Burton (ARDC)

Suggested citation: Australian Research Data Commons. (2022, April 1). ARDC Institutional Underpinnings Framework draft release. Zenodo. <https://doi.org/10.5281/zenodo.6392340>

Licence: [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/)

APPENDIX 1: COMMENTS ON CULTURE CHANGE MODELS

A non-comprehensive list of models related to culture change, with key content notes:

Nosek, Brian (2019) Strategy for Culture Change, Centre for Open Science, web log post 11 June 2019, viewed 26 May 2021, <https://www.cos.io/blog/strategy-for-culture-change>

- Maps change to position on Rogers’s ‘diffusion of innovations’ curve. Envisions desired behaviours progressing from the base to the peak of a pyramid, from ‘making it possible’ to ‘making it required’.

Basford, Tessa & Schaninger, Bill (2016) The four building blocks of change, *McKinsey Quarterly*, web log post, 11 April 2016, viewed 2 June 2021,

<https://www.mckinsey.com/business-functions/organization/our-insights/the-four-building-blocks--of-change>

- ‘The Four Building Blocks of Change’ recommend reinforcing changes through formal mechanisms such as financial compensation, celebrating how changes made a difference to customer experience. The McKinsey model starts with fostering an understanding and conviction with employees by clearly articulating what is being asked of people. This allows an alignment between beliefs and actions because believing in ‘why’ supports behaviour changes (and avoids cognitive dissonance and false consensus). They suggest that leaders develop a change story to help get the message

out and serve as an effective influencing tool which is tailored to each group and describes how things will be better in the future state.

(<https://wmbridges.com/about/what-is-transition/>)

- Bridges Transition Model is another people-focused model that recommends highlighting successes and tangible results to encourage and reinforce desired behaviours. This model has leaders focus on communicating the purpose and benefits of the change to stakeholders at the start

<http://changemanagementinsight.com/nudge-theory-in-change-management/> and Mulholland, Ben (2017) 8 Critical Change Management Models to Evolve and Survive, *Process Street*, web log post, 24 July 2017, viewed 9 June 2020, <https://www.process.st/change-management-models/>

- Recommends 'Clearly defining the change' and 'Using evidence as the best option' where leaders gather information about the current state and compare this to the desired future state. This allows stakeholders to see why the changes are needed and how the nominated path is the best course of action. Nudge Theory presents change as a choice so that people choose to change, and paving the way for them to do this by showing them evidence that it is the best option. Then listening to and taking on board feedback whether or not the desired changes were chosen (i.e. listen, respond and be compassionate). This approach further recommends celebrating short-term goals and milestones to keep the momentum of change going.

Dobbin, Frank & Kalev, Alexandra (2016) Why Diversity Programs Fail: And what works better. *Harvard Business Review*, Human Resource Management section, web log July-August 2016, viewed 14 September 2021, https://hbr.org/2016/07/why-diversity-programs-fail?utm_medium=social&utm_campaign=hbr&utm_source=twitter&tpcc=orgsocial_edit

- Dobbin and Kalev (2016) critique top-down and punitive attempts to impose change, using the example of diversity programs

[Kübler-Ross Change Curve® - EKR Foundation](#)

- The Kubler-Ross change curve is a strategy that breaks down how people process change using the 5 stages of grief.

Mulholland, Ben (2017) 8 Critical Change Management Models to Evolve and Survive, *Process Street*, web log post, 24 July 2017, viewed 9 June 2020, <https://www.process.st/change-management-models/> and <https://stevenmsmith.com/ar-satir-change-model/>

- The Satir Change Model encourages leaders and managers to support employees going through a change process by providing the right support at the right time. The five stages they identify are Late status quo, Resistance, Chaos, Integration, and New Status quo

<https://assets.kpmg/content/dam/kpmg/cn/pdf/en/2020/01/kpmg-s-culture-and-conduct-assurance-framework.pdf>

- KPMG's 'Culture and Conduct Assurance Framework' is a model that should keep an ongoing change process aligned with compliance requirements, particularly related to trigger points for evaluation. This model is instructive in that it includes continual evaluation of the process, but its details might be difficult to apply in the context of university RDM. This model should align with the assurance requirements appropriate for iteratively evaluating RDM culture

change and conduct risk that would identify the need for further culture change efforts. It may also help to identify trigger points for undertaking evaluations.

Lucid Content Team (2021b) How to apply the Plan-Do-Check-Act (PDCA) model to improve your business, Lucidchart, web log post, viewed 23 June 2021, <https://www.lucidchart.com/blog/plan-do-check-act-cycle>

Mind Tools Content Team (2020) PDCA (Plan Do Check Act) Continually Improving, in a Methodical Way, Mind Tools, web log post viewed 24 August 2021, https://www.mindtools.com/pages/article/newPPM_89.htm

- Deming’s ‘Plan, Do, Check, Act’ (PDCA) model (similar to Kolb’s reflective learning cycle), encourages a cyclical process to change. It starts with leaders identifying and analysing the problem or opportunity for change, developing a hypothesis, planning how to test it, and writing out the expected result. The hypothesis is then tested, and the outcomes of the test are reviewed allowing participants to evaluate the solution and revise action as needed. If the plan did not produce the expected or desired results, then participants are directed back to the planning stage to try again

<https://www.prosci.com/methodology-overview>

<https://www.prosci.com/methodology/adkar>

- The Prosci Methodology is a widely used approach to organisational change that focuses on the ‘people’ side of change (as opposed to technology or infrastructure). It particularly draws out the importance of support from organisation leaders. One part of the Prosci Methodology is the ‘Awareness, Desire, Knowledge, Ability, Reinforcement’ (ADAKAR) model, which recommends reinforcement to sustain change. This can be accomplished through positive feedback and recognition to encourage employees to keep following new processes and prevent reversion to old processes. The ADAKAR model recommends leaders run practice or pilot sessions before the change is widely implemented to get feedback on how what is planned will work and be received. It further suggests monitoring the impact of changes (e.g., in terms of participant performance) immediately after the change, with participants providing constructive feedback. Progress should be tracked via goals and metrics set earlier at the start of the change process. If goals are not being met, then the process can be adjusted as needed to keep things on track.

APPENDIX 2: UNIVERSITY EXAMPLES

The following are examples of culture change programs or activities occurring within several Universities, demonstrating a wide range of activity, scale and focus.

Edith Cowan University example

At ECU there have been a range of elements (past and ongoing) on the path to achieving cultural change in Research Data Management (RDM). These include:

1. To encourage ownership and ‘buy-in’, close and meaningful consultation with all relevant stakeholders involved in managing data at ECU. During the development phase of the data management plan (DMP) element this included a Microsoft Teams working group to map a whole-of-life-cycle approach to the collection (including analysis, storage, retention and disposal of data) develop the DMP, test the DMP with the research community, alignment of RDM with

The Code, support its integration into the Research Ethics Management System (REMS), governance and security and ongoing training for staff and HDRresearch students.

2. Once a DMP is submitted and with a view to creating an incentive, researchers (including HDR students) are provided with access to receive an auto-generated email with a link to a unique Microsoft Team which will include SharePoint digital data storage file space in the Files tab. Other members of the research team who may also require access to the information can then be added and research records can be uploaded. IT Services and the Library are also notified and make contact if researchers have atypical storage or any open access requirements.
3. Culture building includes aligning other professional support areas of the University in support of researcher use of a DMP including Researcher Professional Development (RPD) training on the use of the DMP, library, IT services, Information Management and Archive Services (IMAS). This aspect seems important to mitigate against a siloing effect across professional services and to ensure all are on the one page in support of the end users.
4. Ongoing training and dialogue, in particular that which is discipline-specific has proved important to achieve engagement with the academic communities as it recognises the nuances required according to discipline. In the case of ECU this has been especially the case with the creative disciplines.
5. Researcher ‘champions’ and strong messaging from leadership are also important elements.
6. Achieving better understanding of how RDM fits with the wider data management of the institution. And then working with those teams to ensure alignment.

At ECU meaningful consultation and engagement considered the following:

1. Strong linkage of RDM to the Australian Code for the Responsible Conduct of Research (The Code), the benefits obtained (and risks mitigated) that accrue if good RDM practices are part and parcel of the research journey. The metaphor of a journey was employed. In other words, responsible, ethical research entails robust practices of RDM.
2. Couching RDM within a ‘researcher professional development framework’ that emphasises relevant competencies that form part of the training that advances a researcher’s career. In this way researchers can see direct benefit to themselves to the extent that it informs their career track record and can feed into promotion reviews etc.

Griffith University example

Background

At Griffith, we have a range of workshops aimed at researchers of all levels. These current activities strive to advocate and change RDM the data management practice culture across all researcher levels including HDR, ECR, MCR and Senior Researcher. Like most academic organisations, RDMdata management services are delivered by multiple partners including: Library, eResearch Services, Information and Copyright Officer and Research and Ethics Team.

In partnership with the Office for Research, workshops are advertised, promoted and managed via their Researcher Education Development unit. In addition to workshops, eResearch Services and Library provide one-on-one consultations (service by request) to research groups, focusing on their data related management issues or needs. During consultations, we identify the best research storage solutions based on data requirements (i.e. sensitive or non-sensitive data) in addition to advice on how to improve data handling efficiencies (i.e. folder structures and naming conventions). We also advise on relevant data related tools in terms of data collection, data analysis or data processing. These meetings are conducted initially with the Library and eResearch, with other partners bought in when required.

Working with large grant recipients

As from 2020, successful ARC grant submissions are required to deposit a copy of the project RDM Plan into the Griffith Research Management system with Office for Research (Grants Team) overseeing the process. Library and eResearch partners

were invited to provide a specific session for successful candidates addressing and advocating DMP requirements. Post seminar, Office for Research (Grants Team) referred completed DMPs to Library and eResearch seeking our advice and expertise.

Self-Help Resources

Data Management Web Resources²⁶.

The Library in collaboration with eResearch have drawn together web resources on working and managing RDM and are structured on a combination of the research and data lifecycle. The Working with Data pages are intended to be used by all research community members with related information and services provided under sub headings below:

- Manage and Plan
- Find and reuse
- Create and Capture
- Store
- Process and Analyse
- Share and Archive

Online and Face to Face Workshops:

Managing your research data seminar (2 hours):

This covers library on RDM, Ethics, IP and Copyright, eResearch on services available for this (what research storage is available, survey tools, compute).

Working with Sensitive Data (3.5 hours):

When it comes to helping researchers handle sensitive data, we offer a workshop on how to handle sensitive data based on the Five Safes framework. This workshop addresses different legislation and privacy laws researchers need to consider and provides considerations for researchers on data handling and sharing practices during and post project. This workshop is facilitated by QCIF and focuses on Griffith policies²⁷.

We also offer a 'checklist' based on the Five Safes framework²⁸, which is open for sharing and reuse. This document is undergoing continuous improvements and suggestions for change are welcome.

Reproducible Research seminar (2 hours):

Covers topics²⁹ in a beginner/intermediate/advanced level format. Git repo with topics also available³⁰.

We aim to expand this course in future.

Reflections

Activities, resources and workshops can be thought of as having significant overlap with the following three overview topics:

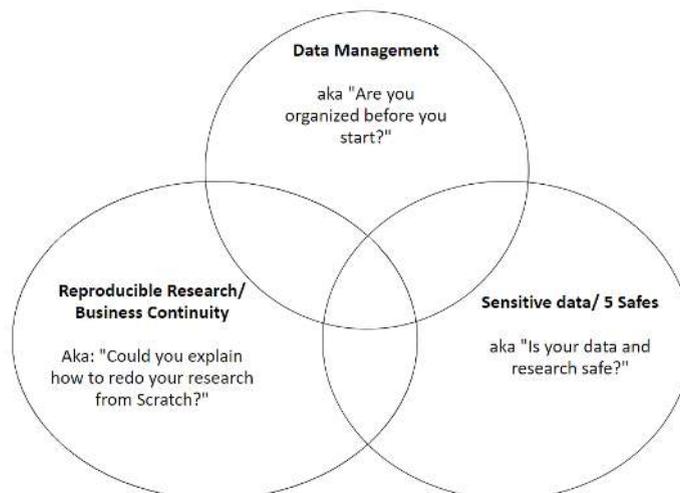
²⁶ <https://www.griffith.edu.au/library/research-publishing/working-with-data/manage-and-plan>

²⁷ <https://www.qcif.edu.au/trainingcourses/working-with-sensitive-data/>

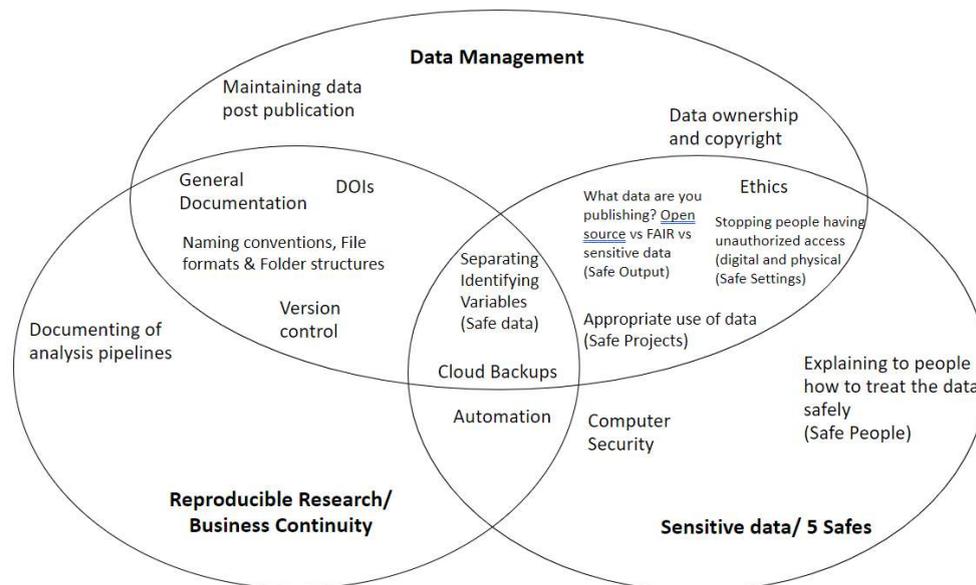
²⁸ <https://drive.google.com/file/d/14d9H9k8JAxUO-nTXJWa5fUnvHnyJ6S2C/view?usp=sharing>

²⁹ <https://blogs.griffith.edu.au/library/2020/10/21/making-your-research-reproducible/>

³⁰ <https://gueslib.github.io/Reproducible-Research-Things/>



For example, across these topics are the following subjects and overlaps:



Macquarie University example

Context

Macquarie University is in the early stages of a university-wide research technology change process that aims to move both institutional processes and researcher behaviour towards best practices for RDM.

Macquarie has already developed an institutional policy, standards and schedule (procedure), an online training and tool for RDM and resources to support users, an institutional research data repository, and secured access to the relevant endorsed platforms that enable best practices. We have newly appointed three dedicated support staff in the Digitally Enabled Research Team; two Data Stewards and one Data Architect. In the last month we have begun offering one-on-one training for

large grant recipients (ARC and HREC) as a trial of our tools and processes ahead of the policy rollout in September and wider changes and training planned for 2022.

Challenges

Change is always hard under the best of circumstances. In the last three years Macquarie has undergone several large change processes: budget reorganisation followed by voluntary and forced redundancies; elimination of a faculty and absorption of the orphaned departments into other faculties; the 2020 Curriculum architecture change which redesigned degree structures and units on offer; introduction of a new curriculum management tool; a professional staff transformation in (2017-2020) where many positions were disestablished and staff were made redundant, and now this transformation is being followed up by a new program looking for more efficiencies. Then add to this the additional stressors placed on staff and students by the COVID-19 pandemic with all of the uncertainties; switching between online and face-to-face learning, working from home while supervising children; adhering to new access and health and safety measures to work on campus... Needless to say, morale is low and staff are exhausted from the constant changes and the impact of these changes on their workloads, mental health and job security.

Introducing another change process while others are ongoing and the impacts of past ones are still being keenly felt will be a challenge for Macquarie. This is why we are keen to have an effective change management model that will deliver the changes that we want to see and showcase the benefits and impacts of the changes. In order to reap the most benefits from the change process we are aiming for best practice in RDM and not simply for compliance. To do this we need to 'win hearts and minds' to create a desire for change, create policy and processes which funnel people towards behaviour change, as well as provide the infrastructure and training to support the desired behavioural changes. Therefore we have begun to review change management models (see 'Overview of models' tab in 'MQ culture change framework' spreadsheet which summarises the different models and provides an overview of their strengths and weaknesses) to see which might best serve us.

Work to date

In reviewing the change management models we found that Nosek (2019) has directly addressed change management on the topic of FAIR Data and Open Science in a university context. The Nosek model, however, makes the assumption that researchers already possess the skills and motivation to make the required changes. This necessitates the use of another model or models in conjunction with the Nosek model to address these gaps. We think that the Kotter³¹ and the PDCA³² models provide components that Nosek is missing. We have developed a hybrid change-model which may address our needs and to start filling in the different components of the framework that we need to make change possible. We are now in the process of incorporating a risk management component with a gap analysis into the framework so that we can understand the impact and priorities of the different components and what might still be missing from the plan. Once all these components have been defined and prioritised we will build a detailed plan with timelines which we will then seek authorisation to act on.

University of Melbourne example

Initiatives with varying degrees of success:

- Discipline- or domain-specific approaches
- Generally conceived and led by individual academics, research groups or academic divisions
- Includes repositories, communities of practice, support networks, specialised data-related training / guidance / resources

³¹ Kotter, J. P. (2012). *Leading change* ([Revised edition.]). Boston: Harvard Business Review Press.

³² Mind Tools Content Team (2020) PDCA (Plan Do Check Act) Continually Improving, in a Methodical Way, Mind Tools, web log post viewed 24 August 2021, https://www.mindtools.com/pages/article/newPPM_89.htm

- Most of these seem to have significant uptake and impact, however, unsure if any formal evaluation has been undertaken as there is limited Central oversight

Initiatives with limited success:

- University-wide initiatives - Data Champions network, Data Stewards
- Conceived and led by central teams
- Based on approach and model established at Delft University of Technology (TU Delft) ³³

Data stewards activity - outlined

- ‘Research Data Stewards’ pilot exploration work at the University of Melbourne commenced in 2019 in conjunction with the ‘Culture’ goals of the university’s *Digital Preservation Strategy 2015-2025*
- **Goal:** To maximise the long-term value of research outputs and other information assets, by embedding a culture of digital curation in research practice
- **Aims:**
 - To build Academic Divisions’ capability in digital curation (the process of creating, managing, and preserving digital data), and
 - To build and maintain a digital curation workforce as a key foundational university service
- **Key themes from pilot exploration:**
 - **Expert advice:** Additional guidelines are required (e.g., information about University services and support, copyright, data ownership, DOIs, suitable file formats, data storage, making data discoverable and usable after people leave the University, access, compliance etc.)
 - **Storage:** Adequate capacity for working data (fast, large volumes) and inactive data (can be slower to access), secure and adequate backup
 - **Access:** Fast and secure access to most-used data, providing easy access for external collaborators, making data accessible to the public/broader audience, how to restrict access to data that is sensitive
 - **Training:** General training in RDM and curation (especially for new researchers)
 - **Appraisal:** Procedures needed to assess enduring value of data for multiple purposes, assess what to keep (e.g., future research; as historical resource), how to support periodic appraisal at defined intervals, when to destroy data according to policies or other requirements
- **Recommendations from pilot exploration:**
 - Develop trial service model for research data stewards with central coordination and embedded experts
 - Trial service model in 2019, assess outcomes, iterate, refine and re-run if successful and valued
 - Promote awareness of research data stewardship to other University data stewardship initiatives, and seek alignment and inclusion
 - Develop training programs to support and enhance Data Stewards’ knowledge and capabilities
- **Recommended activities for data stewardship:**
 - Develop and run awareness programs for centrally provided RDM training and services for data management
 - Develop and run onboarding, training, and support for researchers
 - Collaborate with laboratories or research groups to aid RDM data management planning, curation, and end-of-project plans for data
 - Development of guidelines for data creation and curation
 - Aid development of discipline-specific policies and procedures for curation of data, in conjunction with university long-term digital preservation repository requirements

³³ <https://insights.uksg.org/articles/10.1629/uksg.484/>
<https://doi.org/10.5281/zenodo.3701948>

- o Development of standards and metadata models for different disciplines for standardised curation of research data to support reuse and reproducibility
- **Draft role / responsibilities of Data Stewards at the University of Melbourne emerging from pilot exploration work:**
 - o Assist to identify and assess valuable research data
 - o Assist to develop appraisal guidelines for keeping data long-term
 - o Provide guidance to develop and implement research “end of life” strategies and plans for valuable/important digital research data
 - o Assist to develop and disseminate faculty data curation procedures, standards, and guidelines
 - o Provide advice/best practice guidance on research data curation processes (e.g., naming strategies, version control, the role of metadata, data storage, selecting file formats for long-term storage)
 - o Understand broader trends in domain-specific RDM and curation, and drivers for curation of digital assets
 - o Understand domain-specific drives for curation of high-value digital assets and significant research data
 - o Assist to identify and analyse existing and evolving data curation needs and priorities
 - o Embed within academic environments to enhance trust and relationship building between research support staff and academics
 - o Increase awareness of existing services and support for research at the university
 - o Report to a central research support coordination point (e.g., a Coordination role)
 - o Liaise with other Data Stewards to share practice and relevant issues, and to help create a supportive peer environment for the success of data stewardship practice
 - o Liaise with key faculty stakeholders to ensure data stewardship aligns with existing and emerging research workflows and needs
 - o Develop and deliver training and information sessions on data curation to ensure ongoing skills development for researchers
 - o Participate in personal and professional development training and upskilling to ensure continued improvement of skills
 - o Assist research groups to coordinate, develop, and maintain a data strategy across external partners
 - o Assist with gathering quantitative and qualitative metrics to assess the success of data stewardship to enhance and develop data stewardship as a distinct discipline
 - o Assist with the development of reports to evaluate and monitor data curation practice across the faculty
- **The Data Stewards program has since ceased at the University.** While the stewards initiatives have ceased due to a refocus of resources towards other areas, the majority of the “recommended activities for data stewardship” (above) have been supported with existing resources as part of a central digital and data stewardship program led by a team within the library.
- **The following are some specific challenges documented as part of this**
 - o Curation and stewardship practice are not generally a foundational or business-as-usual practice in research currently, making it difficult to enhance this essential function
 - o There is a lack of broad awareness or governance awareness to enable decision making for prioritising stewardship and curation activities and enhancement

Data Champions Network - outlined

- The Data Champions Network was intended to:
 - o Serve as an informal and interactive support/interest group for academic and professional stakeholders to exchange RDM knowledge
 - o Stimulate mentoring and networking opportunities
- This initiative is ongoing, albeit without a formal structure
- Challenges encountered:

- o Limited funding and resourcing of personnel to coordinate activities, maintain engagement and develop communication material
- o Limited institutional leadership / management buy-in
- o Relied on voluntary participation by researchers/professional staff – therefore attracted more junior staff or HDR students at the University (**key point of difference between UoM initiative and TU Delft model. The latter required commitment from researchers*)
- o Ongoing disruptions and burden on academics due to COVID-19
- o Lack of a clear value proposition and effective communication of service
- o Need for continuous evaluation and improvement

Overall Learnings

- Requirement of a coherent RDM foundation, before embarking on cultural change initiatives -
 - o Researchers understand, engage with and practice effective RDM
 - o RDM services are proactive, coordinated and require minimum effort from researchers
- ‘RDM Culture Change’ requires three levels of stakeholder engagement:
 - o **Collaboration:** RDM-related support teams work together to articulate a communications and implementation plan with unified messaging. A coordinated University-wide approach may result in greater uptake and consequent RDM success/change. This approach can be further enhanced by the introduction of defined RDM responsibilities for support teams and/or a dedicated RDM coordination team/entity.
 - o **Empowerment:** University and Academic leaders understand and promote RDM. RDM services and initiatives are representative of academic needs.
 - o **Participation:** Disciplinary communities foster RDM uptake and compliance
- Holistic institutional approaches to the management of research data and research records must be supported and enabled by the University’s professional structures but will require sustained academic leadership and commitment for true impact. Often the impact is not obviously visible for many years after the initial conception, hence alternative methods of evaluation to justify ongoing investment are required.

University of New South Wales example

Formed RDM Team

RDM was initially managed by the library, as part of the Outreach program and with the ResData platform for Data Management planning. Funding was found for a small RDM team in the research division, in charge of change management, training, outreach, and consultation for RDM across the university. This allowed us to have a single point of contact for RDM (RDM@UNSW.edu.au) and coordinate RDM activities with dedicated staff. These staff members also represent UNSW externally in ARDC projects, government contacts etc.

Communications channels

The RDM team (along with representatives from the library, IT, and others) coordinated a number of communications initiatives including:

- Town hall sessions
- Small-group sessions
- Leadership presentations
- Newsletter articles
- Websites
- Videos (intro to RDM, using tools)

- Gimmicks (RDM ice-cream ☺)

We promoted these as much as possible in the first year, then switched eventually to a more even pace of update sessions and new-staff updates.

Training development

This was an essential part, deployed for anyone to use and eventually essential for HDRs.

Management Buy-in

From the start the research division endorsed the program, with messages sent by the DVCR at the beginning. Presentations given to the faculty admins, HDR management, and library management ensured people were aware of the program and buy-in from each area. This took more time for different areas.

Distilling messages

We tried at all stages to make the messages given simple and digestible. Complicated policies were simplified for easy consumption, with references to the more complicated policies for detail if needed. This allowed us to make handouts and simpler messaging. Focus was put on the basics that were lacking (using good storage platforms, classifying data, doing training, make/update RDM plans).

Ongoing Support

The RDM team was intended to be an ongoing support channel for RDM, able to update the materials and policies (collaborating with the other parts of UNSW) and continue to consult with and support researchers. This role will evolve to match the needs of the university, incorporating input from management and external entities like ARDC.

University of Southern Queensland example

While older and less in formal use, perhaps an example of the culture change program within University would be the USQ Quality Management Framework³⁴. A continuous improvement-based approach [Approach, Deploy, Results, and Improvement] was adapted from several models, mainly the PDCA Model.

While not explicit, informally the cultural change program within the University would also generally align with the Centre for Open Science's five levels of intervention strategy for culture and behaviour change [Nosek (2019)]:

- Make it possible [make necessary infrastructure available]
- Make it easy [develop user friendly processes]
- Make it normative [form communities of practice]
- Make it rewarding [identify and promote benefits of desired approach]
- Make it required [publish policy and procedures]

For example, regarding RDM, over several cycles the University has gradually introduced change through a range of initiatives including:

- A suite of data repositories to assist researchers to manage their research data
- Established an online process / form for researchers to get access to the tools
- Developed guidance material on how to use the various RDM tools
- Encouraged peer communication and provided access to a RDM champion

³⁴ <https://policy.usq.edu.au/documents/13421PL>

- Promoted the benefits to a researcher from using the repositories
- Commenced development of policy and procedure gradually changing from the ‘make it possible’ to ‘make it required’ stance

While there is still a way to go, the properties that have contributed to the current level of success have been adopting a continuous improvement process that has focussed on addressing the needs of the individual researchers while encouraging the move to a consistent organisation wide model. The focus has been on carrots more than sticks but ensuring the imperatives of RDM are also explained.

References:

- Research Data and Primary Materials Management Procedure³⁵
- Research Data Website³⁶
- Research Data Management Plan³⁷ (template included below)
- eResearch Services³⁸

University of Tasmania and a domain example

An excellent example of successful cultural change in RDM has been at the Institute for Marine and Antarctic Studies (IMAS). Review their data page³⁹ with associated blurb:

Data counts among our most valuable assets at IMAS and we are committed to the concept of Open Data.

All data collected by IMAS researchers are archived, curated, and managed by IMAS, and often supported by related organisations such as the Integrated Marine Observing System (IMOS), the Australian Ocean Data Network (AODN) and the Tasmanian Partnership for Advanced Computing (TPAC). Our guiding framework is that all data that are not commercial-in-confidence or restricted by legislation should be shared with researchers for analysis and interpretation. IMAS also operates facilities and hosts data sets of national and global interest and for the benefit of the community.

IMAS has developed a set of Data Management Guidelines⁴⁰ to assist researchers with managing their data and adhering to the IMAS Data Management Policy⁴¹ (applies to all research staff and HDRRHD students in IMAS). Contact the IMAS Data Manager for any queries regarding how to discover, manage or publish your research data at IMAS.DataManager@utas.edu.au

University of Wollongong example

The University of Wollongong has an RDM Working Group composed of faculty representatives who are used to ‘spread the word’ on all things RDM. The working group is responsible for making key RDM decisions and reports to university executives. The working group is very large so sub-committees are formed when work needs to be done. Having this representation of people in a working group has helped to create RDM solutions and tools that are easy to use and relatively well received by the wider academic community. Improvement is needed in our communication and support, and we are working to mandate Research Data Management Plans for all researchers and students, but this working group will be critical in creating culture change. We have recently launched our RDM tool, and with the support of the research office and tech support, we are

³⁵ [USQ Research Data and Primary Materials Management Procedure](#)

³⁶ [USQ Research Data Website](#)

³⁷ [USQ Research Data Management Plan](#)

³⁸ [USQ eResearch Services](#)

³⁹ <https://www.imas.utas.edu.au/data>

⁴⁰ [Data Management Guidelines \(PDF 628.0KB\)](#)

⁴¹ [IMAS Data Management Policy \(PDF 299.0KB\)](#)

starting to see more people engage with it. It has been an “easy sell” because it has an easy to use interface, people want to do the right thing, or this solves some of their problems (i.e where to store research data securely). But we need people to think about research planning earlier in the research project lifecycle so we need to create a culture around this.

Western Sydney University, a parallel example of change

Organisational Change Management, including Cultural Change, is a part of the implementation of a new Student Management Platform. This has been a multi-year and multi-million dollar project that is expected to touch just about every part of the university. Go-live for the new platform is 6th October this year.

The project has a team of around five staff working full time on the practice adoption and change management aspects of the project. The project change plan is based on the Prosci⁴²/ADKAR⁴³ framework. The team have adapted the framework into a very simple and practical approach that involves three key areas of focus: Know, Feel, and Do:

Know: This is what the project team need staff across the university to know. At a very basic level, this means knowing what is going to change and when that will happen. Training and the formal communication plan are central to this.

Feel: The project team have been working on checking that university staff are feeling confident in the new platform, and that they feel supported in the upcoming transition.

Do: The project team have identified the key actions and activities that university staff will need to do to ensure that the adoption of the new platform is successful. Examples include participating in training and practising the training outcomes.

Key learnings from the project

“Tone from the top” is absolutely critical. The leaders within the organisation need to be visibly and actively promoting and supporting the initiative. Without this, all other efforts to drive change become significantly more difficult, and in fact are very likely to fail entirely. Within the context of RDM, this means that the VC and DVC-R within the university must be actively supporting and promoting the uptake of RDM if this is to be successful.

Challenges

The key challenge that the Project team have faced is getting university staff to fully engage with the practical activities that are essential for them to properly learn the new system. To some degree this includes participation in the organised training, but also, and to a greater extent, they are finding that staff are not always taking the opportunity to practise what they learn in the training session. Within the ADKAR model, this is the second “A” (Ability) step. University staff have (A)wareness, and (in the main) (D)esire, but in many cases university staff do not yet fully have the (A)bility they will need to work effectively with the new system.

⁴² <https://www.prosci.com/>

⁴³ <https://www.prosci.com/methodology/adkar>