

2010

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Recommended Citation

Kim, Richard M. and Kaplan, Simon M., "Preparing for Research Assessment: Co-evolution and Gamesmanship" (2010). *ACIS 2010 Proceedings*. 10.

<http://aisel.aisnet.org/acis2010/10>

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Preparing for Research Assessment: Co-evolution and gamesmanship

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Abstract

In this paper we adopt a complex systems perspective to examine the perturbations caused by the introduction of the Research Quality Framework (RQF) at a research-intensive Australian university. This case is instructive as it 1) presents a Federal policy initiative that attempted to fundamentally alter the recognition and reward mechanism within a regulated funding environment, 2) analyses the strategies of an institution and its research groups as they sought to not only comply with the implementation of the RQF but to maximise their outcome, and 3) it reveals the ways that some actors used this perturbation to advance their own interests. In short, this case represents an instrumental study into the dynamics of how information systems, organisations, and individuals co-evolve in practice as they seek to navigate a complex problem scenario.

Keywords

co-evolution, complex adaptive systems, actor-network theory, research quality framework RQF, case study.

INTRODUCTION

The phenomenon of IS and organisational change, in particular the theorising of its process and causality, has troubled IS researchers and practitioners since the field's inception. It is curious that as organisations attempt to adapt to complex problem scenarios they focus upon streamlining organisational processes through systems integration and collaboration. A consequence of such integration, however, is the removal of protective cocoons (Kallinikos, 2005) that insulate systems from exogenous change thereby exposing actors to adaptive turbulence setting in train an unforeseen, emergent dynamic of restlessness across systems and processes. In theorising this dynamic, organisational change researchers seek either to understand the *what* of change by dividing implementation into *a priori* stages through which the organisation must be guided (Cooper & Zmud, 1990; Kwon & Zmud, 1987), or the *how and why* of change, by viewing implementation as a sequence of events that emerge over time (Orlikowski, 1996; Quattrone & Hopper, 2001). Others emphasise the diverse, vested interests of stakeholders and attempt to understand how order arises through negotiation, such as technology resistance models (Markus, 1983), IS evaluation (Wilson & Howcroft, 2005), or more broadly, studies of socio-technical systems (STS) that recognise the interdependence of social and technical systems of organisations (Kaghan & Bowker, 2001). In contrast, adaptation to complex problem scenarios can be conceptualised as a co-evolutionary environment where software systems, organisations, and individuals are each forced to adapt continually to the changing context wrought by one another's movements. When considering the role of information technology in organisational adaptation, there is a growing recognition of the contextual and mutually constitutive nature of IS on organisations and organisations on IS (Walsham, 1993; Boland, 1991). Recently Lee (2004) has called for a reformulation of an IS as being both the result of an information technology enabling an organisation and an organisation enabling an information technology. He notes that these mutually and iteratively transformational interactions can be expected to continue without end and therefore the result is not determinant but emergent (Lee, 2004). Despite these calls to shift our focus, the co-evolution of IS and organisations has received little attention.

In seeking to theorise the IS engagement phenomenon in this way, we find Kaghan and Bowker's (2001) proposition of integrating the rationalist/functionalist perspective of complex adaptive systems theory (CAS) (Axelrod & Cohen, 2000) with the pragmatist/culturalist perspective of actor-network theory (ANT) (Law, 1992; Walsham, 1997; Callon, 2001) to be useful. An integration of these theories holds promise for both the theory and practice of IS engagement; not only to inform studies of the sociology of technology and society, but also to

help designers and managers of IS engagements negotiate the attendant complexities that they encounter. To illustrate we examine the perturbations caused by the introduction of the Research Quality Framework (RQF) at a research-intensive university that we shall refer to as the Australian State University (ASU). Although the RQF assesses an organisational group's performance based upon the aggregation of individual achievement in grants, publications, and esteem factors, the analysis in this paper will focus in particular upon the criterion of publication output. Despite the RQF being repealed by the incoming Rudd Government, the analysis presented in our paper remains applicable as it 1) presents a Federal policy initiative that attempted to fundamentally alter the recognition and reward mechanism within a regulated funding environment, 2) analyses the strategies of an institution and its research groups as they sought to not only comply with the implementation of the RQF but to maximise their outcome, and 3) it reveals the ways that some actors used this perturbation to advance their own interests. In short, this case represents an instrumental study into the dynamics of how information systems, organisations, and individuals co-evolve in practice in response to a complex problem scenario.

THEORETICAL BACKGROUND

Complex Adaptive Systems

Complex adaptive systems (CAS) theory is a branch of complexity research that focuses upon the dynamics of complex systems by unpacking the adaptive behaviour of interacting actors. Axelrod & Cohen (2000) define a CAS as a system composed of a population of agents, that we will refer to as actors, that seek to adapt. Actors, or populations of actors, interact with their environment and other actors within neighbourhoods, and employ a variety of context bound strategies that may be planned and purposeful or conditioned and reactive. Within the system a variety of performance measures exist to reinforce actors or strategies. These reinforcement mechanisms play an important role in steering the behaviour of actors; the design and application of criteria for success, coupled with the attribution of credit, creates an environment in which actors may choose to act in a manner that protects or maximises their perceived interests. Reinforcement mechanisms, however, do not operate within a static objective reality, but rather are interpreted to create an intersubjective-objective reality that is "reflexively related to actor's conceptions of their own interests" (Callon & Law, 1982).

Within such a framework, CAS theorists seek to understand how actors and/or strategies change over time creating variation, and how they become more or less common within a population (selection). Co-evolution occurs when actors are forced to adapt continually to the changing context wrought by others' strategies in order to remain relatively fit (van Valen, 1973). Unlike traditional evolutionary models that purely describe forces in terms of their impact upon a population (Van de Ven & Poole, 1995), CAS is also concerned with the intentionality and enactment of individual actors thereby incorporating elements of teleological motors of change. When considering teleological motors and intentionality, rationalist/functionalist approaches typically view Management as an "active" organisational brain that controls a "passive" organisational body, namely the human and non-human actors within the organisation, with the implicit assumption that managerial action is fundamentally adaptive and beneficial (Kaghan & Bowker, 2001). Intentionality, however, is not the sole domain of managers, and given that rights and resources are typically unequally conferred, and that actors may be subject to different reinforcement mechanisms the framework leaves room for conflict and power struggles. Therefore whilst CAS provides a useful lens to understand the motor of co-evolution (Kim & Kaplan, 2006), our understanding of the co-evolutionary dynamics is strengthened by incorporating a dialectic perspective such as actor-network theory to understand how order emerges in practice.

Actor-network theory

Actor-network theory (ANT) focuses upon the negotiations and trials of strength that are necessary to achieve partial blackboxing of new technologies and processes (Latour, 1987; Law, 1992; Walsham, 1997). It relies on the concept of socio-technical systems as a negotiated order constructed, tested and reproduced through action (Kaghan & Bowker, 2001), focusing on how it is that durability is achieved (Law, 1992). ANT theorists stress that closure of blackboxes is neither complete nor final (Latour, 1996) and require continued work to hold the divergent interests of allies in place thus demonstrating an interesting dimension of 'order'. Rather than merely being defined as a state or a pole, we see that order is an effect generated by heterogeneous means (Law, 1992) and that the "stabilisation of obdurate networks of human and non-human actants is an essential feature of all technological evolution" (Constant II, 2002, p. 1254). As noted by Latour "contrary to the claims of those who want to hold either the state of technology or that of society constant, it is possible to consider a path of an innovation in which all the actors co-evolve" (Latour, 1991, p. 117 italics in original). The applicability of ANT to IS studies has been the subject of increased attention over recent years (Walsham, 1997; Hanseth et al., 2004) and has been used to study the co-evolution of IS and organisations (Kim & Kaplan, 2005). Kim and Kaplan argue that by appreciating the multiple perspectives and inscribed traits of actors as well as the role of ambiguity in creating a body of allies, ANT provides valuable insight into understanding the form of co-evolution; order

emerges in the form of blackboxes after socio-technical negotiations have been articulated, contested and resolved through processes of enrolment and translation of interests.

RESEARCH DESIGN

This study was conducted using interpretive methods from an underlying philosophical position of critical realism. During the formal research period 25 meetings were observed and transcribed, and 17 semi-structured interviews were conducted (thereby capturing the perspectives of 37 individuals). Semi-structured interviews provided an opportunity to examine the research phenomena (co-evolution and order creation) while remaining sufficiently open for participants to reflect and steer the interview.

The sampling of participants for interview was conducted across three key dimensions in an attempt to discover maximum variation in the strategies employed and perspectives held by participants. First, participants were selected according to the type of involvement, or experience, with the research management process – namely, executive/managerial, research-related, finance-related, or administrative. Second, participants were selected according to their broad group, because it was envisaged that faculty, school/institute, and central administrative staff would have different roles and goals. Last, participants were selected across the spectrum of the organisational hierarchy. During the interviews, we took social practice as the point of departure; structured the interview around four basic ‘what’ and ‘how’ questions, though used follow-up questions to seek clarification or probe deeper; and used dialectics as an interview tool to quickly push participants beyond rhetoric to the outer limits of their understanding of the phenomenon. This last point is especially important as interviewees generally seek to present themselves in a positive light (Alvesson & Kärreman, 2000), offering ego-defensive explanations that attribute success to themselves and failure to forces outside their control. By using semi-structured interviews, we attempted to be guided by a participant’s understanding rather than imposing our preconceived ideas. Interviews were structured around the following questions:

1. How do you manage research activities within your unit?
2. What challenges, or issues, do you encounter in undertaking these tasks?
3. How will the implementation of the RQF impact the way in which you manage and measure research?
4. What are you doing to prepare for the RQF?

Questions one and three are ‘structural-how’ questions designed to elicit how the socio-technical system engages various participants. These questions omit leading statements, such as the attribution of positive or negative qualities to the interaction, whether it has changed the nature of participants’ work or whether this engagement has invoked a reactionary response. Questions two and four are ‘referential-what’ questions that encouraged participants to reflect upon and articulate their experience of work within the broader socio-technical system. These questions were designed to gain insight into the meanings that work and the various research management systems hold for participants. In addition to these questions, we would follow up threads that emerged during other interviews. All interviews were recorded and transcribed. Although informed by CAS and ANT, transcripts, meetings, and documents were analysed inductively to (a) understand how software systems and organisations have co-evolved in practice, and (b) determine how order has emerged in the overall environment.

THE RQF: STEERING RESEARCH TOWARDS RANKING AND QUALITY

In this section, we analyse, in part, the interaction, selection mechanisms, and adaptation that arose from ASU’s preparation for the Research Quality Framework. The Research Quality Framework (RQF) was proposed by the Howard Government’s Department of Education, Science and Training (DEST) as a mechanism to fundamentally change the way that Research Block Funding would be allocated. DEST oversaw the annual Higher Education Research Data Collection (HERDC) in which each University would submit by the 30th of June a summary of its research performance for the prior calendar year. The submission contained a summary of research income and the number of research publications by publication category. DEST would then allocate block funding for the next calendar year to each University based upon its performance. Under the RQF, panels of experts would assess the quality and impact of research conducted by groups of academics nominated by their universities. This basis would then be used to allocate research funding for the next three years. Funding would no longer be allocated purely upon quantum but upon quality and impact. Table 1 summarises the RQF timeline.

Table 1: RQF Timeline of Significant Events

Date	Event or Milestone Description
May 2004	The Prime Minister announces the establishment of the Quality and Accessibility Frameworks for Publicly Funded Research.

March 2005	Expert Advisory Group presents RQF Issues Paper to the Education Minister “For Australia to be competitive in a knowledge based economy, our research must be of the highest international quality and standing. The development of a Research Quality Framework (RQF) is therefore one of the highest priorities for the Australian Government. An RQF will provide a consistent and comprehensive approach to assessing publicly funded research. It will drive positive research behaviours, encouraging researchers and research organisations to focus on the quality and impact of their research.” (Expert Advisory Group for an RQF, 2005, p. 3 Minister's Foreward)
May 2005	Submissions due from stakeholders in response to Issues Paper
Feb 2007	Opposition Education Minister announces that, if elected, the Rudd Labor Government would scrap the “fundamentally flawed” RQF. (Illing, 2007)
Sept 2007	Education Minister approves final RQF specification (DEST, 2007)
24 Nov 2007	Federal Election, the government is overthrown and Rudd’s Labor Party is elected to power.
21 Dec 2007	RQF is repealed.

NEIGHBOURHOODS AND INTERACTION

Within this neighbourhood, we find the Australian Government and its Education Minister, his Department (DEST), the Australian universities, and the Federal Opposition. By studying the interaction of these actors, we see how strategies and behaviour emerge around the allocation of research funding. The Prime Minister and Education Minister announce a policy agenda that seeks to fundamentally reshape the higher education landscape. Policy, however, is not born fully articulated. It emerges tentatively and is subject to transformations. There is always the matter of how it will be perceived by the public. Unsurprisingly, therefore, an early justification for the RQF was to provide greater transparency for “government and taxpayers so that they are better informed about the results of the public investment in research.” (Department of Education Science and Training, 2004) Issues were formulated and presented by an advisory group and opened to stakeholders for comment. Through its relationship with an alliance of research institutions – the Group of Eight (Go8) – ASU attempted to shape the dialogue of policy to its favour; so too do other networks of allies within this neighbourhood such as the alliance of technology universities, the academic union, and public sector non-educational research organisations. Here we find an interesting facet of collaboration, that is the tension between lobbying as a collective versus pursuing selfish strategies as an individual. The Go8 lobbied to have the RQF definition amended to favour research intensive institutions, but each university individually sought to maximise its own return. As Go8 universities collectively attract 70 percent of the available Commonwealth research funding, any subsequent gaming by these institutions will likely be at the expense of a supposed ally.

The benefit of compliance lies in the association of esteem signals, to encourage signal following behaviour of international students and research staff, rather than in substantial shifts in funding.

The RQF does not introduce new money into the sector, much to the disappointment of the Vice-Chancellors and Presidents who have lobbied to the contrary. Rather, it changes the way that the existing funding is allocated. Although the Office of V-P(R) is confident that ASU will do well in the assessment, there is an expectation that the share of funding that it will secure through the exercise will essentially remain the same as prior years. For ASU and its Go8 partners, they perceive that the real benefit of participation lies in the “esteem factors” that result from independent ranking. A Head of School stated that the ability to claim that objective measures have ranked his discipline as 4* (pioneering, outstanding performance) would assist in both the recruitment of “brand-conscious Chinese and Indian students” and in building “scale and focus” in his research groups. This esteem indicator is an example of what CAS regards as the attachment of tags. Tags serve as signals to other actors, such that actors seek out others with whom to interact on the basis of similar or desirable tags. When these actors with mutually desirable tags interact a lot, new neighbourhoods form (Axelrod & Cohen, 2000, p. 95). We see this when academic neighbourhoods coalesce around research interests such as symposiums, conferences, and journals. The process of aggregating the performance of individuals up to organisation units strengthens the signal that is associated with the organisational unit. The relative strength of this signal serves to attract other academics and assists in the building of ‘scale and focus’ in research groups within schools and institutes.

With the implementation of RQF, we find new networks of actors coalescing to support the assessment exercise, which comprise research group convenors, research administrators, the digital repository, reference librarians, and panels of experts. The repository is both an actor and an example of a new neighbourhood that contains the items that are submitted for review with accompanying statements by each research discipline that provides the rationale for their inclusion. It interacts with actors from both the academic and administrative neighbourhoods;

the academic leaders self-submit items, the administrative staff review these, and the reference librarians ensure that the bibliographic details are complete to enable content linking. All of these activities are undertaken to provide the panel of experts with access to ASU's assessment items.

What then determines membership eligibility of these emerging neighbourhoods? If the benefit of RQF-compliance lies in the association of esteem signals, would we be surprised to discover gamesmanship over the composition of discipline groups?

Passport control on ASU's research train 'May I see your papers please?': publication as a passage point to research group membership

It comes as no surprise that ASU searches for the most favourable alignment of academics as it prepares for the RQF. With the funding formula proposed by RQF, universities would be rewarded based upon the quality of work and number of academics put forward for assessment as a proportion of the overall size of the research group. ASU could, therefore, modify its position by both increasing the number of academics who could strengthen the quality of the publication portfolios put forward and by removing those academics from the research neighbourhoods who weakened the overall average quality. We find that ASU employed both strategies. One Deputy Director boasted of the "major coup" in attracting an entire research group to his institute and the resulting resource in Tier-1 papers that this entails.

"We've just scored a major coup. [Name of CI] and his whole research group will be moving up to the Institute from [another Go8 Institution]. V-P(R) got a whisper that the 31st of December was going to be the cut-off date for the RQF, so there was a rush around to negotiate a change in appointment dates in the offer letters back to the 24th of December so that we can make the 31/12 census date. We've just bought in 20 Nature papers; you know how important that is? So we've now locked them in for the next five years."

Deputy Director, interview, 15 November 2006

It was originally thought that it was sufficient for these appointments to be in place by the 31 March 2007 census date for them to be counted for the RQF. DEST, however, made a late ruling that all appointments would need to be finalised by 31 December 2006 to stop or minimise "poaching raids" between institutions (Illing, 2006). Hearing a "whisper" that this would be the case, the V-P(R) expedited the appointment for all relevant incoming staff to ensure that they could be counted as a resource. Figure 1 below demonstrate the surge in new academic appointments commencing in December 2006 and the number of inbound tiered publications as a result.

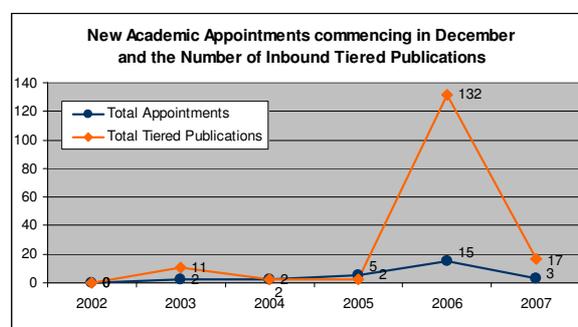


Figure 1: Total Inbound Tiered Publications in December 2002 to 2007

The second strategy was to consider the membership and categorisation of existing staff. DEST allows academic staff to be categorised under one of the four possible functions – Teaching and Research, Research Only, Teaching Only, and Other – until 2007, however, ASU had never reported academics as Teaching Only in the annual staff census. ASU saw itself as a research-intensive institution, and therefore all academics were to be appointed on a Teaching and Research or Research Only basis. With the funding formula of RQF, ASU saw that it would be beneficial to reclassify those academic staff who under-perform on the criterion of research as Teaching Only. ASU had its Senate approve the creation of new Teaching-Focussed appointments and invited non-research-active academics to consider accepting a revised offer of appointment under new contract terms. This encouraged variation in ASU's academic population by revising the selection mechanisms for these staff; for performance review and promotion these staff would no longer be measured according to research output. The variation was equally beneficial for ASU who would no longer need to report these staff as being aligned with a research group thereby strengthening the group's overall average.

We are not suggesting that the Teaching-Focussed appointments were solely a strategy to maximise RQF outcomes. They had been proposed earlier by the Teaching and Learning committee. Nonetheless, the unusual speed of its tabling for Senate and implementation in February with call for nominations by mid-March, so that

contracts could be redrawn before the 31 March census date, supports the argument that the Senior Executive and research group leaders were cognisant of the benefits of realigning membership of individuals within the relevant academic neighbourhoods.

VARIATION, SELECTION, AND ADAPTATION

A stated goal of the RQF was to “drive positive research behaviour, encouraging researchers and research organisations to focus on the quality and impact of their research.” (Department of Education Science and Training, 2004) The feedback mechanisms in this complex ecosystem of universities, however, are quite slow and can be likened to that of a small rudder steering a big ship. This is due to delays in publication pipelines of 12 months at minimum, combined with the statutory reporting mechanism that is a lag indicator. To adapt to the proposed funding environment challenges introduced through RQF, the Office of V-P(R) introduced a number of iterative adjustments to strategy arising from the adaptation of others. The first move introduced tiered journal lists. The second move purchased subscriptions to citation data from Thompson and Scopus. The third move was to conduct mock school-based research quality assessments that required the academics and 24 schools to “critically analyse their recent output” (Executive Officer, memo 2006). The gamesmanship and adaptation involved in each of these moves will be discussed here.

First move: the introduction of tiered lists

For an actor that does not belong to the relevant academic neighbourhood, and therefore does not have a detailed knowledge of a field with which to assess the merit or meaningfulness of what is said, it necessary to develop proxies to assess meaning. This initially consisted of simple tests to determine *where* it was said (e.g., a blind-refereed outlet journal, or conference, a book, or book chapter) when reporting annual research quantum to DEST. To refine this measurement in preparation for the RQF, the V-P(R) asked discipline groups to self-nominate a tiered list of journals with which an academic’s publications could be assessed. This is still within the paradigm that *where* something is said determines its meaning; the corollary being that meaningful work published in untiered outlets is discounted by the Centre. The tiered list of journals was introduced in 2005 and retrospectively applied to 2004 publications. Figure 2 below charts ASU’s total publication points reported to DEST for the years 2001 to 2007. The number of tiered publications reported in 2007 represents a 37 percent increase over the 2004 figures.

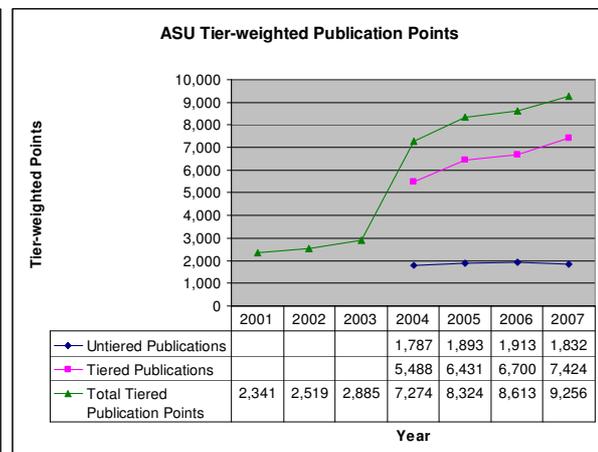
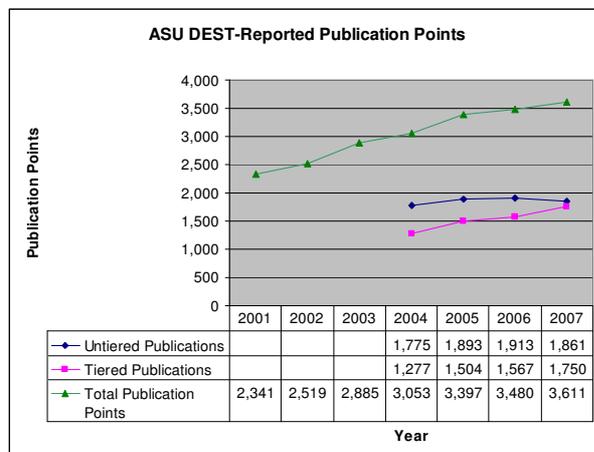


Figure 2: ASU’s DEST-Reported Publication Points Figure 3: ASU’s Tier-weighted Publication Points

With the introduction of journal tiering, the V-P(R) modified the weighting schema for prorated point calculation: tier-1 publications earned a 5-point weighting; tier-2 earned a 3-point weighting; untiered publications remained the same. This new scheme was retrospectively applied to the prior year’s (2004) DEST-reported publications. Although the DEST-reportable point calculation remained the same for reporting publication data in the HERDC, the V-P(R)’s new tier weighting was used for the internal Faculty Budget Allocation process. By applying this weighting in the Faculty Budget Allocation it undermined the value and proportion of funding allocated for un-tiered publications. Figure 3 above charts the effect of applying the tier-weighting to ASU’s publications. In the previous chart (Figure 2), un-tiered publications accounted for slightly more than half the total number of points and would therefore generate half the publication budget allocation to faculties and schools. Under the new mechanism, however, un-tiered publications contributed less than 25 percent to the total tier-weighted points.

It is unsurprising to discover evidence of gamesmanship over the formulation of these Tier-1 lists given the direct link that these tiered lists played on funding allocation and the fact that schools were given the opportunity to

define them. Naturally, schools nominated a selection of journals in which its academics had published. For example, one research group proposed a list of journals where the *Journal of Research and Practice in IT* (JRPIT) (formerly the Communications of the Australian Computer Society) was listed alongside *MIS Quarterly* (MISQ) and *Information Systems Research* (ISR) as its three Tier-1 journals. Without detailed knowledge of the research domain, and given the plausible journal title, this was accepted by the Office of the V-P(R). The assertion that JRPIT, as good as it is, is of comparable quality to MISQ and ISR, however, would have been difficult to substantiate had a bibliometric analysis been possible at that time (Thomson's ISI Web of Knowledge assesses the impact of *MIS Quarterly* as 5.183 from 5684 citations against an impact of 0.429 from 62 citations for the *Journal of Research and Practice in IT*).

Second move: aligning the university with Thompson and Scopus

Realising that it had little domain knowledge in the selection of journals, the Office of V-P(R) purchased subscriptions to the Thompson Citation and Scopus datasets in the following year. This was a strategy that attempted to introduce independence and objectivity to the school-formulated tier lists by introducing impact factors. Further, the enrolment of a new technological actor served to empower its interests, or perhaps more accurately it attempted to erode the power of the academics. A concern of the Thompson Citation dataset amongst some group leaders is its limited coverage of some fast-moving fields; however, a benefit of the dataset is the ability to see all publications of ASU academics, not just the publications that were produced while at ASU. If the dichotomy of meaning between the academic and administrative neighbourhoods revolves around *what* is said, versus *where* it is said, the RQF adds an additional qualifier of *when* it was said. For the HERDC, it is only possible to report publications that were published in the prior year, where the academic affiliation by-line on the publication specifies ASU. The RQF modifies this qualifier to allow publications produced in the past five years by the nominated academic irrespective of where they were affiliated.

Third move: conduct a mock assessment exercise with knowledgeable experts

For the final stage of preparation for RQF, the Office of V-P(R) conducted a mock assessment exercise with 24 schools. Knowledgeable experts were assembled, for this exercise, to assess the work of each discipline group. This provided the best assessment of meaning. Although the experts were informed by the outlet of the publication (i.e., *where* it was said), they were qualified to assess the meaning of the paper independent of the outlet if the school's justification for inclusion warranted this evaluation.

Before RQF was proposed, the interest levers encouraged quantity rather than quality. This alignment of individual with school was the result of funding allocation reinforcement mechanisms put in place by the University, which were the result of the old funding mechanisms used by DEST. Book chapters, journal articles, and conference papers each earn one point prorated across the authors, and a book earns five points prorated. Under this reward structure, academics were encouraged to generate as many publications as possible and naturally "will push on the easiest margin to improve their ranking" (Pomfret, 2007). A strategy of pursuing relatively 'soft publications,' such as joint conference papers with research students, was therefore an effective strategy in boosting one's own research productivity measures and one of the perceived benefits of RHD supervision (Hockey, 1996). This perceived benefit may diminish as joint publication with research students may no longer be as useful when assessed according to quality and impact.

Turbulence presents opportunity – the Library seeks to advance its interests

To comply with RQF, DEST mandated that every university have a digital repository to hold all items submitted for assessment. The repository would provide a single point for assessors to perform their task, it would provide a direct link to the publication content (e.g., the journal article, conference paper, or book), and it would conceal the identity of the assessor so that the university would not know who assessed them or which items were assessed directly. Up to this point, PUBLISYST (run and supported by the Research Office) was the official 'home' for ASU publications, but support for it began to erode as the DEST requirements became clearer for RQF. For the HERDC, administrators collect and verify each publication's eligibility for inclusion in the given year and enter the bibliographic summary into PUBLISYST. This representation is suitable for the HERDC process of validating and reporting to DEST, but this is not the same as the publication itself. In this regard, ASU's Library Systems Group saw the RQF as an opportunity to advance its interests. It had already developed a digital repository (eSpace) for theses and academic publications, but as participation by the academic community was voluntary it was not used widely. The Library Systems Group argued that with additional funding it would be able to extend the repository to support both the RQF and the HERDC process.

"We need to move quickly. The Library has the resources, willingness, and imperative so I think hang the consequences and the questions of where [the publication is] going to live long term and get the Library to do it."

Executive Officer, RQF Steering Committee meeting, 30 May 2007

Having enrolled the Executive Officer and secured additional funding from the V-P(R), the Library Systems Group set out to enrol and woo academics to self-submit all of their prior publications. To enrol the support of academics it was decided to make use of an academic's esteem interest lever that seeks to disseminate their work. ASU has a policy that places an academic's personal web pages behind a preliminary notification page warning that the views are not those expressed by the University. In practice, this policy stops personal pages from being indexed by Google. The Library argued that eSpace provided the academic with a number of benefits. First, its contents were 'googled' nightly to provide greater visibility. Second, it returned information on hit counts to provide feedback on the number of times articles were viewed and/or downloaded.

A federal election and the unravelling of RQF – the ultimate selection mechanism

An Opposition publicly opposed to the RQF and a federal election due in November created an environment of uncertainty for all those involved with the RQF implementation. As the election draws closer, there are voices within the university sector that hope that the RQF will die (Healy, 2007) and those who argue to continue the quality reforms irrespective of the outcome (Johnson & Shiel, 2007).

“Group convenors have been asked, and [context statements] should have been in three weeks ago. But then we've got a Federal Election in three weeks and the Opposition has said that they're going to undo the reform. So we're dealing with a morale problem. We have to keep going assuming the Coalition will win, but if after 11 and a half years we finally do get up then after getting rolling drunk, we wake up Sunday morning and try to figure out where we go from here.”

Executive Officer, interview, 8 November 2007

On election day, the Executive Officer quoted above casts one of the 12,930,814 votes and in so doing the sitting Howard Government with its majority 86 seats to Labor's 60 and 4 Independents is relegated to the opposition benches with a minority 65 seats to Labor's 83 and 2 Independents. Triggered by collective action, the 'context' changes, the landscape deforms, and the “fatally flawed” RQF is repealed.

SUMMARY

This paper has presented a case study of a complex problem scenario namely preparations for research assessment arising from the Howard Government's Research Quality Framework initiative. Although the RQF was repealed, this paper remains applicable as it reveals the strategies and gamesmanship that emerge within a regulated funding environment. The strategies and gamesmanship that we have documented, whilst possibly controversial, are not immoral, illegal, nor mean-spirited. Rather, by adopting a co-evolutionary perspective using CAS we can summarise the dynamics of this environment as being characterised by (a) organic growth around localised academic self-interest with respect to academic promotion and funding, (b) activity at each level (e.g., research group, school, faculty, and university) to maximise local-funding and esteem outcomes within a regulated environment, and (c) distrust that actors at lower levels are attempting to game the system. Furthermore, we can characterise this socio-technical system as existing in a state that is perpetually poised – subject to perturbations from the actions and strategies of each actor. The dynamics described continue to apply to Rudd's Excellence in Research Australia (ERA) initiative, and, in all likelihood, to future Federal higher education reform initiatives.

The RQF interactions altered the state of the environment. Many actors benefited by aligning their arguments sufficiently with the RQF and by using it as a pretext for action (but not so closely that it was conditional for continued action). In other words, their arguments were not so tightly coupled that they too would fail if the RQF failed. Another point of interest, borne out from an ANT perspective, is that quantifiable achievements, related in particular to publications, are not fixed in the order of things. Rather the achievements are subject to ongoing trials as to whether what was said was meaningful. We find that the publication emerges as a focal point of interaction between the academic and administrative neighbourhoods. While the members of one neighbourhood, the academics, are qualified to interpret *what* is said and on this basis assign meaning, the other needs to create proxy measures to determine meaning such as *where* it was said. Initially this determination was based upon the type of publication medium, i.e., book, book chapter, journal paper, or conference paper. As a result of the perturbation from the RQF and the introduction of esteem, we find that publication achievements are resubjected to new trials as proxy measures are iteratively refined. First, publications are subjected to the introduction of school-nominated tiered journal lists. Then, realising the inherent gamesmanship ASU aligns itself with new technological actors Thomson and Scopus. Last, publications are subjected to a mock assessment exercise with knowledgeable experts from the academic neighbourhood.

The RQF-triggered variation within the academic selection mechanisms has resulted in variation within the academic population. It is somewhat ironic that an unintended consequence of ASU's gamesmanship to strengthen its research groupings has resulted in the protection of some academics most at risk from the exercise. By creating and recognising the Teaching-Focussed appointment category in preparation for the RQF, 77 ASU

academics are now potentially 'safer' within the ASU environment as the research-productivity selection mechanism no longer applies to them. From the perspective of the Senior Executive, the introduction of journal tiering into the faculty budget allocation process by the Office of V-P(R) "has focused minds on the importance of journal selection," (Executive Officer, memo 2006) resulting in a 37 percent increase in tiered publications and deprecation of un-tiered outlets for the internal Faculty Budget Allocation. The preparations for the RQF have led academics and administrators to recalibrate "work practices, policies and strategic thinking to accommodate the drive to quality" (Johnson & Shiel, 2007). It has also been recognised that universities have discovered aspects of their operation that were hidden previously: "Whether you love the RQF of you despise it, the intelligence it gives you about your own organisation is remarkable" (Prof Brooks, Pro-Vice-Chancellor (Research Strategy), The University of Adelaide as quoted by Lane, 2007).

Despite the death of RQF, it has left traces that have resulted in the stabilisation of new transformations and associations. The world did not revert to the state prior to the former Prime Minister's announcement of May 2004 that formally initiated the RQF. Rather, it left traces – fossilised markers of processes and systems – that point to generational shifts. The death of RQF at the hands of the incoming Rudd Government created the systemic platform from which universities now adapt and respond to Rudd's Excellence in Research Australia (ERA) initiative. If one were an evolutionary palaeontologist using CAS it would appear that change blew through the system stabilising a new order; a transition that can be described and traced using ANT.

Neither ANT nor CAS are prescriptive theories, but we have demonstrated that their use in concert produces novel and important insights about IS implementation phenomena. Whereas goal-seeking behaviour of actors is implied within ANT, CAS deals with intentionality and a state-based view of a system and its dynamics – through interaction, selection mechanisms and adaptation. Conversely, where transition is implied within CAS, ANT provides the narrative on the transformations and their mechanics – through enrolment, translation, punctualisation, and blackboxing. ANT reveals how heterogeneous actors are constructed, aligned, and sustained as actor-networks. It also highlights the surprise of action and how action can lead to unintended consequences. When applied together, these theories provide insight into the emergent dynamics of socio-technical co-evolution in response to complex problem scenarios.

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