Electronic Research Administration

Reflections on Research Management and Administration (RMA) in UK universities and in particular on Electronic Research Administration (ERA) and its perceived effect on the quality and quantity of research

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A doctoral report submitted in partial fulfilment
of the requirements of the University of Sunderland
for the degree of Professional Doctorate

April 2012

ABSTRACT

Research Management and Administration (RMA) is a developing profession. Many RMA staff work in Universities and other Research Organisations, but they can also be found in agencies that fund research; in fact anywhere where research is undertaken or managed. RMA can be defined as *"the leadership, management or support of research activities"* and one area of endeavour that RMAs are involved with is Electronic Research Administration (ERA): *"IT system(s) designed specifically to support research management or administration"*. The aim of my professional doctorate is two-fold: to show my contribution to the development of RMA as a profession in the UK; and to demonstrate my practical contribution to advancing ERA systems including undertaking research to address the question: *"is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research?"*

Over the years (1997-2011) I have been involved in and led many initiatives that have helped to shape RMA, such that it is now recognised as a profession in the UK. I chart my role in the development of RMA in the UK through the growth of the professional Association for Research Managers and Administrators (ARMA) and other related initiatives.

The second strand of this doctoral work reflects on the specific ERA developments that I have introduced at the University of Sunderland; collectively known as GRS On-line. In particular it highlights how and why the various Sunderland GRS systems were initiated, developed, enhanced and sometimes superseded. Two elements of GRS On-line are discussed in detail and reflected upon as case studies: Costing & Pricing, which underwent a number of major changes; and Publications Information, which evolved in a more organic way. The impact of both areas is considered in terms of benefits and detriments to research endeavour.

A mixed methods study of the perceived effects of ERA systems across the UK on the quality and quantity of research undertaken is also conducted. This report presents the results of the Sunderland case studies which are complemented by the analysis of a series of national questionnaires looking at the perceptions of research managers and administrators, and academic staff regarding ERA systems.

From the evidence presented it is shown that both RMA and ERA are perceived to have a positive impact on both the quality and quantity of research undertaken. Furthermore, the evidence base for the value of research management and administration as a profession is advanced; not only for individual RMAs, but also to the research community as a whole.

ACKNOWLEDGEMENTS

There are many people that I would like to thank for their contributions, help and support during the course of my doctoral studies and indeed the fifteen or so years before that.

Firstly I would like to thank Professor Andrew Slade who introduced me to the world of research management and administration and was my director and mentor until 2007; and Professor Jeff Brown who lead the University research strategy until he retired in 2006. I would also of course like to acknowledge the support of all the friends that have worked with me in the Graduate Research School at Sunderland and in particular Kathleen Callender and Diane Davis. There are many other colleagues around the University that have helped me to grow as a professional, too many to mention by name. I would also like to thank the University for supporting my registration fees during my studies.

I owe a great debt of gratitude to ARMA: the office, board of directors and wider membership for allowing me to help shape the profession of research management and administration in the UK. Particular thanks go Rosemary Hatch formerly of the ARMA office for being able to provide information and documents at the drop of a hat, and with a smile. It is difficult to pick out individuals, but I shall try: Steff Hazlehurst, Pauline Muya, Nigel Bilsborough and Maggy Taylor from the board have always made a difference, and Dr Ian Carter was also kind enough to support my initial doctoral proposal.

Of course I would not have completed this work without the support and guidance of my supervisors: Professor Helen Edwards, Dr John Fulton, and previously Professor Gilbert Cockton; and my external adviser Dr Serena Cooper.

Another key part of my journey was the professional doctorate cohort experience championed by the ever enthusiastic Professor Peter Smith. The re-energising effect of the group has helped enormously, notably with fellow students (now Dr) Paul Andrew, William Ault, Liz Herring and Jane Thompson; I wish all of them well with their doctorates.

On a personal note I must acknowledge the support of my long suffering wife Sue and the therapeutic effects of walking our dogs Holly and Jazmine. So I would like to dedicate this work to her, our children, grandchildren, and parents who have seen somewhat less of me than they might have wished over the past three years, and indeed the years before that.

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GLOSSARY

In most fields of endeavour there are many terms and abbreviations that come into common usage; Research Management and Administration, and Electronic Research Administration are no exceptions. The following glossary of terms may prove useful to those approaching this work from adjacent subject areas.

ACU	Association of Commonwealth Universities, see ACU (2010)
AGM	Annual General Meeting, of an association or company, where constitutional issues are discussed
ANSI	American National Standards Institute
ARCISS	Association of Research Centres in the Social Sciences, see ARCISS (2010)
ARMA	Association of Research Managers and Administrators (UK) see section 3.9, and ARMA (2010). Also one of the seven sections of the portfolio, see section 11.1
ARMS	Australasian Research Management Society, see ARMS (2010)
AUA	Association of University Administrators, see AUA (2009)
AURIL	Association for University Research and Industry Links, see AURIL (2009)
BBC	British Broadcasting Corporation
BBSRC	Biotechnology and Biological Sciences Research Council, one of the seven research councils of RCUK that fund research in the UK.
BRAM-NET	Brunel Research Administrators & Managers Network, a network of RMAs at Brunel University
BRUCE	Brunel Research Under a CERIF Environment, a JISC funded project led by Brunel University

C4D	CERIF for Datasets, a JISC Funded project, see C4D (2012)
CAURA	Canadian Association of University Research Administrators, see CAURA (2010)
CERIF	Common European Research Information Format, a set data standards for research information, see CERIF (1991), maintained by euroCRIS
CRA	Certified Research Administrator, a North American certification for RMAs, see RACC (2009)
CRIS	Current Research Information System, a term that is almost synonymous with RMAS and ERA, see section 4.1
D&M	DeLone and McLean, see the D&M IS Success Model, a method for assessing the impact of information systems, in section 4.7
DARMA	Danish Association of Research Managers and Administrators, see DARMA (2010)
DCS	Data Collection System, the generic name for the systems used for making submissions to the 2008 RAE and 2014 REF
DORCISS	association of Directors of Research Centres in Social Sciences (now ARCISS)
EAA	Electronic Application and Assessment system, the submission system used by MRC prior to their adoption of Je-S
EARMA	European Association of Research Managers & Administrators, see EARMA (2009)
ECC	Electronic Commerce Committee of the US Federal Government which introduced an ANSI standard for grant information
EDS	Electronic Document Submission, the forerunner to Je-S

e-GAP	electronic Grant Application & Processing system (now e-GAP2), submission system of the Royal Society and British Academy
eGMS	electronic Grant Management System of Cancer Research UK
eGrants	electronic Grants system of the Wellcome Trust that funds biomedical research
EPrints	A brand of Institutional Repository software used at the University of Sunderland (see section 8.3)
EPSRC	Engineering and Physical Sciences Research Council, one of the seven research councils of RCUK that fund research in the UK
EPSS	Electronic Proposal Submission Service, of the European Commission
ERA	Electronic Research Administration (see chapter 4) the use of an ERA system or an RMAS or a CRIS. Also one of the seven sections of the portfolio, see section 11.2
ERAQ	Electronic Research Administration Questionnaire, one of the seven sections of the portfolio, see section 11.3
ESPRIT	European Strategic Program on Research in Information Technology, part of the EU Framework Programme for research funding
ESRC	Economic and Social Research Council, one of the seven research councils of RCUK that fund research in the UK
Est	Esteem, one of the seven sections of the portfolio, see section 11.4
EU	European Union
euroCRIS	European organisation, see euroCRIS (2010) responsible for maintaining CERIF

EXRI	Exchanging Research Information (in the UK), a JISC funded project, see Rogers, Huxley and Ferguson (2009)
fEC	full Economic Costing (see section 7.1) the UK methodology for costing research
fECAF	full Economic Costing and Approval Form, the costing and pricing system used at the University of Sunderland 2005-2010, see section 7.3
FG	Sunderland Focus Groups, one of the seven sections of the portfolio, see section 11.5
FP8	Framework Programme 8 (from mid 2011 called Horizon2020), the main research funding mechanism of the EU (2014-2020)
FSD	Flexible Service Delivery, a JISC funding programme
GMG	The grants processing system used by BBSRC, NERC and PPARC (now superseded by the SSC)
GrAppl	Grant Application, form (electronic 1997-2005), research proposal approval costing and pricing form used at the University of Sunderland, see section 7.2
GRMN	Global Research Management Network, see GRMN (2010)
GRS	Graduate Research School (latterly Graduate Research Support), the central research support office at the University of Sunderland
GRS On-line	On-line (web) access system to view and edit the GRSdB
GRSdB	The database of research information held by GRS
HEFCE	Higher Education Funding Council for England, provides core research funding to Universities in England
HEI	Higher Education Institution, in effect, a university

HESA	Higher Education Statistics Agency, in the UK, that collects and provides analysis on information (including research) about UK HEIs
HEURO	Association of UK Higher Education European Officers, see HEURO (2009)
Hist	Historical Items, one of the seven sections of the portfolio, see section 11.6
HR	Human Resources, a department that looks after personnel issues
IKT	Institute of Knowledge Transfer, an accrediting body for knowledge transfer professionals in the UK
IMS	Integrated Management System, of UKRO, providing information and intelligence on EU funding opportunities
INORMS	International Network of Research Management Societies, see INORMS (2010)
IRIOS	Integrated Research Input and Output System, a JISC funded RIM project using CERIF to link publications with the projects that they relate to, see (ERA43). There was also a follow on project, see IRIOS-2 (2012).
IP	Intellectual Property, relating to ownership of creations of the mind
IS	Information Systems, electronic (computer) systems
IT	Information Technology, generic term for electronic (computer) hardware or systems
Je-S	Joint Electronic Submission system of RCUK for research funding proposal submission and management

JGP	Joint Grants Processing, an RCUK group concerned with the harmonisation of the managing of research proposals to research councils
JISC	Joint Information Systems Committee, provides direction and funding for Information Technology systems and advances in the HEI sector
KPI	Key Performance Indicator, a metric of particular interest for management purposes
LGM	Leadership, Governance and Management, a funding programme of HEFCE
LSE	London School of Economics and Political Science, part of the federated University of London
MRC	Medical Research Council, one of the seven research councils of RCUK that fund research in the UK
NAMES	a JISC funded project working to uniquely identify individuals and institutions involved in research; see NAMES (2010)
NCURA	National Council of University Research Administrators, in the USA, see NCURA (2010)
NE-ARMA	An ARMA like grouping in the North-East of England, including RMAs from the Universities of Durham, Newcastle, Northumbria, Sunderland and Teesside
NERC	Natural Environment Research Council, one of the seven research councils of RCUK that fund research in the UK
NIH	National Institutes for Health, a major US health research funder
NSF	National Science Foundation, a major US science research funder

OA	Open Access, literature which is “digital, online, free of charge, and free of most copyright and licensing restrictions”, Suber (2010: p.1)
OCRIS	Online Catalogue and Repository Interoperability Study, a JISC funded project led by the University of Strathclyde
OECD	Organisation for Economic Co-operation and Development, an international body that promotes policies for global economic and social well-being
ONR	Office of Naval Research, a major US marine research funder
OOCS	Outputs and Outcomes Collection System, the RCUK initiative to collect publication and other information related to research council funded projects, it became the Research Outcomes Project (ROP)
*Open*DOAR	Directory of Open Access Repositories, see Oliver (2006)
ORCID	Open Researcher & Contributor Identifier, an international initiative to disambiguate author identifiers, see Fenner (2011)
OSG	Operational Strategy Group, of RCUK
PAF	Post Award Finance, a long standing course provide by ARMA
pFACT	A brand of Costing and Pricing software used at the University of Sunderland (see section 7.4)
PGR	Post-Graduate Research, usually pertaining to PGR students
PI	Principal Investigator, person who leads a research project
PPARC	Particle Physics and Astronomy Research Council, now subsumed into the STFC, one of the seven research councils of RCUK that fund research in the UK
Praxis	Company that provided commercialisation training in the HEI sector, now part of PraxisUnico

PraxisUnico	Association for UK research commercialisation professionals, see PraxisUnico (2010)
Prof	Profession, one of the seven sections of the portfolio, see section 11.7
QR	Quality Related, name of the core HEFCE (and other UK Funding Councils) research funding stream, allocated through RAEs (and in the future through the REF)
RA2	Research Assessment exercise (RAE) form 2, holding information on research publications and other outputs
RACC	Research Administrators Certification Council, in the United States of America, see RACC (2009)
RAE	Research Assessment Exercise, UK multi-annual assessment of HEI subject research excellence run by the Funding Councils to determine the distribution of QR funding. Now replaced by the REF
RAG*net*	Research Administrators Group Network, the forerunner to ARMA
RCUK	Research Councils UK, the umbrella group of the seven UK Research Councils (AHRC, BBSRC, EPSRC, ESRC, NERC, MRC, STFC)
REF	Research Excellence Framework, from 2014 replaces the RAE to determine QR research funding allocations to UK HEIs
RIM	Research Information Management; the part of RMA that is concerned with the use of ERA systems and associated information. Also the name of a funding call from JISC in relation to IT systems in that area

RMA	Research Manager and Administrator (see chapter 3) – a person; or Research Management and Administration (see chapter 3) – the role (or the profession as a whole, depending on the context)
RMAS	Research Management and Administration System, a major HEFCE/JISC funded project to develop a modular framework to enable HEIs to procure interchangeable elements of a CRIS / ERA system. Also used generically as a close synonym for a CRIS or an ERA system
RO	Research Organisation, a generic term for an institution that undertakes research, including universities and other research institutes
ROCG	Research Organisations Consultation Group, an interface group between RCUK and ROs
ROP	Research Outcomes Project (formerly OOCS Project) of RCUK, collecting publication data relating to RCUK funded projects
ROS	Research Outcomes System, to collect publication and other information related to research council (AHRC, BBSRC, EPSRC and ESRC) funded projects. It was produced in late 2011 from the ROP, NERC will join in 2013
RSP	Repositories Support Project, JISC funded initiative to support (open access) repository development in UK HEIs
SARIMA	Southern African Research & Innovation Management Association, see SARIMA (2010)
SiriusWeb	HEFCE funded project that produced an on-line staff costing tool for the UK HEI sector, see Busby (2003)
SITS	Strategic Information Technology Service Ltd, a brand of student record system; used at the University of Sunderland

SRA	Society of Research Administrators, now branded SRA International, a North American RMA society, see SRA (2010)
SRBP	Student Recruitment and Business Partnership, the name of the service at the University of Sunderland that was responsible for supporting enterprise activities
SRIF	Science Research Investment Fund, a multiannual UK Funding Council programme designed to upgrade estate and equipment
SSC	Shared Services Centre, of RCUK, providing unified back office systems for the seven UK Research Councils
STFC	Science and Technology Facilities Council, one of the seven research councils of RCUK that fund research in the UK, formed in 2007 from the merger of PPARC and the Council for the Central Laboratory of the Research Councils (CCLRC)
SURE	Sunderland University REpository (see section 8.3), the local branding of the EPrints instance at the University of Sunderland
UAT	User Acceptance Testing, a phase in software systems development
UCL	University College London, part of the federated University of London
US or USA	United States; United States of America
UK	United Kingdom of Great Britain and Northern Ireland
UKCGE	UK Council for Graduate Education
UKOLN	UK Online, a JISC funded initiative to inform policy and practice in library, data and information systems
UKRDS	UK Research Data Service, a JISC funded initiative to look at the feasibility of a national shared digital research data service

UKRO	UK Research Office, a Research Council funded office in Brussels to provide intelligence on EU funding initiatives, see UKRO (2010)
UniCo	UK association for knowledge transfer professionals, now part of PraxisUnico
UUK	Universities UK, the association of UK Universities (formerly known as CVCP, the Committee of Vice-Chancellors and Principals)
Vitae	UK organisation, funded by RCUK, for the professional development of doctoral researchers and research staff
WARIMA	West African Research and Innovation Management Association, see WARIMA (2010)
WRN	Welsh Repositories Network, a JISC funded initiative to develop a network of interoperable institutional repositories

1 INTRODUCTION

This report charts seventeen years (1995-2012) of practical experience in developing Electronic Research Administration (ERA) systems in a UK University. The latter four years have been shaped by a more reflective style of work, informed by my doctoral studies. There are two main strands of work, the development of the wider profession of research management and administration (RMA) in the UK and a specific research focus of ERA systems, in particular attempting to answer the question "is it perceived by RMAs and academic staff that ERA systems can improve the research quality and quantity?".

1.1 Overview

This doctoral report is divided into a number of chapters somewhat akin to a standard PhD thesis but at the same time subtly different. Much of the work reported occurred before I started my doctoral studies in 2008 and is used to provide evidence of my journey from being a research manager and administrator to becoming a reflective practitioner. Along the way, my extensive work in both RMA and specifically ERA systems has provided plenty of material to reflect on. In particular the ERA systems that I developed at Sunderland have provided the setting for two case studies.

1.2 How to read this Report

A professional doctorate is by its very nature a portfolio based piece of work (Maxwell and Kupczyk-Romanczuk, 2006). This ***Doctoral Report*** presents the main body of work. It is possible to read some aspects in a stand-alone manner but often points are elucidated or expanded upon by referencing work that is part of the ***Portfolio*** of additional evidence. The contents of the portfolio are varied; some of the evidence is confidential and not available to the casual

reader, and other material is in the public domain. However, the portfolio index (see chapter 11) provides a brief explanation of the context and importance of each item.

1.2.1 Structure

This introductory chapter provides information on how this doctoral report and the associated portfolio volumes are structured and referenced. This report is designed to be self contained in the hope that the casual reader will not need to delve into the portfolio.

Chapter 2 describes my personal journal, reflecting on how I became a Research Manager and Administrator with an interest in Electronic Research Administration systems.

Chapter 3 focuses on my profession of Research Management and Administration (RMA) and how it has matured over the years. It also (in section 3.12) details my contributions to the development of the profession in the UK.

Chapter 4 draws in the notion of Electronic Research Administration (ERA) and details my contributions, both in terms of systems that I have developed at Sunderland and my wider influence in ERA in the UK.

Chapter 5 moves from the practitioner's world into the arena of research and describes the research approach for my doctoral work as a whole and leads into the research projects that I have undertaken.

Chapter 6 describes a series of questionnaires that I undertook into the perceptions of staff to ERA systems, in order to address the question "is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research?"

Chapter 7 provides the first of two case studies of ERA systems, looking at the various costing and pricing systems that have been used at Sunderland over the past 15 years.

Chapter 8 presents the second case study, on the 16 years of publication information systems at Sunderland.

Finally, chapter 9 reflects on these various strands of work and draws conclusions and suggests future directions for both Electronic Research Administration and Research Management and Administration in the UK as a whole.

Following the references in chapter 10, the portfolio items are listed in chapter 11 with a short description and context for each item. The items themselves are to be found in a separate two volume portfolio.

1.2.2 Portfolio Referencing

Items in the portfolio have been grouped into seven broad areas and have a unique Area and Number reference. Within this doctoral report, portfolio items are referenced using the following notation: (Area99). Where 'Area' is the broad group and '99' is a two digit number, for example the poster that I gave on Sunderland's Electronic Research Administration systems (ERA22) at the INORMS conference in 2010 refers to item number 22 in the ERA area of portfolio. In chapter 11 of this doctoral report an index to the portfolio is provided with a summary of each item and an indication of its significance. It is intended that this index provides sufficient information for this doctoral report to be read stand-alone without requiring recourse to the portfolio.

The seven portfolio areas are:

- ARMA (ARMA) – see section 11.1
- Electronic Research Administration (ERA) – see section 11.2
- ERA Questionnaire (ERAQ) – see section 11.3
- Esteem (Est) – see section 11.4
- Focus Group (FG) – see section 11.5
- Historical Items (Hist) – see section 11.6
- Profession (Prof) – see section 11.7

Portfolio items in the first two areas (ARMA and ERA) are contained within the first volume of the portfolio and the latter five (ERAQ, Est, FG, Hist and Prof) are in the second volume of the portfolio.

1.2.3 Non-Portfolio Referencing

When referencing other academic and professional material a more standard academic referencing system (Harvard style) is used; this will be familiar to most readers. The references themselves are to be found in chapter 10 of this doctoral report. Note that some portfolio items can also be found in the references section, so for example (ERA22) my INORMS poster on ERA at Sunderland is also an academic output and hence referenced. When it is referred to in this doctoral report for its academic content then the Harvard reference will be given before the portfolio reference: (Kerridge, 2010b)/(ERA22).

1.2.4 Acronyms

As with all areas of endeavour there are a number of acronyms for the reader to familiarise themselves with. Acronyms are either expanded upon or referenced with their first usage; however that may not help a reader that has dipped into a specific part of the report. To address this, from page 9 a glossary of terms is listed and where appropriate there is also a reference provided, see chapter 10, often including a web link. So for example: ARMA, the Association of Research Managers and Administrators in the UK is included both in the Glossary on page 9 and referenced as (ARMA, 2010), in chapter 10, where the web link 'www.arma.ac.uk' is provided.

2 PERSONAL VIEWPOINT

This chapter outlines my background and how I came into the profession of research management and administration. It looks at my contributions to both the profession in general and to Electronic Research Administration (ERA) systems in particular; reflecting on the changes that have occurred as a result of my work. It starts with some context about me and my history and then summarises my contributions; firstly to the profession (section 2.2.1) and secondly to Electronic Research Administration (ERA, see section 2.2.2) and my ERA research (section 2.2.3). Further details on my contributions to the profession can be found in section 3.12; and to ERA in sections 4.5-4.8 and chapters 6-8.

2.1 My History

I had always had an interest in science and technology from an early age and built up a fascination with computers from an early Science of Cambridge Mk14 computer that my father built from kit form in the late 1970s. However I was more interested in the software rather than the hardware side of things and coding the 'duck shoot' programme was like magic... then trying to imagine what fantastic games (what other computer applications would a young boy be interested in) could be produced if you had more than 256 bytes of memory to play with, the possibilities seemed endless! My father occasionally managed to bring a mini computer back from work for weekends and I would love playing Star Trek. Then one Christmas in the early 1980s the family got a Commodore PET 3016 and there was no going back for me, I was to be a computer programmer. A BBC B series computer followed about five years later and I managed to secure two periods of programming at the Shell Centre for Educational Software at Nottingham University during the holidays. After school I studied at Durham University for a BSc in Computing (with some Maths and Geology). In 1987, I was one of five fresh faced computer science graduates who set up Pixel Ltd to make our fortunes in software development and consultancy. We had nothing to lose, but unfortunately not much experience to

bring to the market, so after three years we wound up the company and went our separate ways; at least we had managed to break even.

From there I moved into the university research sector as a computer science Research Assistant at Durham University and then at the University of Sunderland, see (Hist03) for a list of my publications. After four and half years as a researcher a job in the newly formed research office at Sunderland arose and, in 1995, I became a Research Manager and Administrator (RMA). At that time I did not know that I had found my profession and indeed there are still those that would not, even in 2012, recognise RMA as profession.

After a few months alone in the wilderness I discovered that there were other people like me doing similar jobs in other Universities. After a brief flirtation with the Association for University Research and Industry Links (AURIL, 2009), I came across the Research Administrators Group network (RAG*net, 2005*) and found that its ethos matched my own, a focus on research support and the sharing of good practice, I became a member in 1997.

During the first few years I was perhaps in transition and led a dual life as Research Manager and Administrator and as a researcher, in the third space identified by Whitchurch (2008a), for example being Principal Investigator on an EU Framework project, SupplyPoint [see (Hist04) for a list of deliverables, and for an overview of the project aims see Kerridge, Slade et al. (1998)/(Hist02) and (Kerridge, Halaris et al, 2000)/(Hist01)].

This background allowed me to bring the experience of software development from research projects and the commercial sector into the research office.

2.2 My Contributions

I argue that I have made significant contributions both to Research Management and Administration (RMA) as a profession and specifically to the community of practice (Wenger, 1998) in Electronic Research Administration (ERA), including research in the latter. This section provides a précis of the highlights which are expanded upon in later sections (specifically in section 3.12 for RMA and chapters 4, 6, 7 and 8 for ERA).

Since 2000 I have been a member of the (then) RAG*net* executive committee, (now) ARMA board of directors. The following sections outline the contributions that I have made to the profession and then in relation to Electronic Research Administration.

2.2.1 Research Management and Administration

Research Management and Administration as a profession is detailed in chapter 3, what is presented here is an overview of my contributions to its development in the UK.

I became a research manager and administrator (rather than a researcher doing research and undertaking some RMA functions) working in a central research office in 1995. At that time I was the only such person in the institution and spent much of my time trying to find out what I should be doing and how I could go about doing it. It did not occur to me back then that there might be people in other institutions in the same situation. I assumed that other Universities had large research support offices and would not be interested in sharing good practice with me. I attended a few training courses and, in 1997, went to an event that was to change, or perhaps initiate, my career; the RAG*net* spring workshop in Lancaster. The programme looked useful and I met other people doing similar jobs in other Universities who all wanted to share experience and ideas. This was exactly what I had been looking for (not that I knew I had been looking for it): an association of like-minded people, a community of practice (Wenger, 1998).

When I joined RAG*net* (now ARMA) in 1997 there were around 100 members. By 2000, when I became a board member, numbers had risen to around 250. From 2001 to 2006 I had responsibility for membership and saw the numbers increase from about 300 to over 900. An overview of the membership profile is provided in (Kerridge, 2010h)/(Prof10) and updated in (Prof14).

I cannot of course claim all the credit for the swelling membership numbers, but I was tasked by the committee to try to increase membership numbers and so was aiming to do just that. The fact the RAG*net* was providing a service (contextualised training and the community of practice) that could not be found

elsewhere meant that whenever I did advocate the association I generally seemed to be pushing against an open door. The feedback from events of all sorts was consistently high (Tomlin and Tomlin, 2003); the driver was there, this emerging profession of research managers and administrators needed an association that they could call their own.

I have contributed directly to the association and hence to the profession, by actively taking part in the various meetings, sessions and events that I attended. It soon became clear to me that even with my, then, relatively short experience I had something to offer my peers, even if sometimes it was just my enthusiasm.

Over the years I have presented on many topics for RAG*net*/ARMA, including: Funding from the USA (ARMA35, ARMA36), Supporting Research Proposals in the round (ARMA38, ARMA39 & ARMA40), Full Economic Costing (ARMA28, ARMA37, ARMA33), Mentoring (ARMA29), Research Council Funding (ARMA30) and Post Award Finance (ARMA44, ARMA45 & ARMA05), see section 3.12.4 for further details.

I have also talked on and presented posters on many aspects of Electronic Research Administration which are covered in the following section (2.2.2).

Perhaps my contributions to the association through my role on the committee have been even more important. For example I produced feedback reports from various conference sessions (ARMA19, ARMA20, ARMA21, ARMA22 and ARMA23). Later, in my role as secretary I organised the Annual General Meetings and produced the AGM minutes from 2007 (ARMA42) onwards. Underpinning all of this I played an active role in the various committees and planning meetings since 2000 that have defined the direction of travel for the association. I am active in promoting Research Management and Administration as a profession and, for example, was invited (Est13) to write the influential (Mahsood, 2010)/(Prof07) piece in Research Fortnight (Kerridge, 2010g)/(Prof08) contrasting the roles of researchers and research administrators, see section 3.3.

At a regional level I was instrumental in setting up the informal NE-ARMA group for heads of the research offices at the five campus based universities in north-

east England. One of the major achievements of this group was the setting up and running of a series of 'introduction to research administration' (Prof18) events in 2010; which were extremely well received (Kerridge, 2011b)/(Prof19).

On an individual level I have been a mentor for the head of a research support office at a research intensive university (ERA45) and have more recently been paired (again through the ARMA mentoring scheme) with a more junior member of research management and administration staff at another research intensive university (Prof22).

I also play an active role in progressing the ARMA professional development framework (Prof24) and have spoken about it nationally (Prof20, Prof21) and internationally (Kerridge, 2010e)/(Prof02). The latter leading to the development (Prof12, Prof13) of an informal international group of those interested in sharing good practice in professional development in research management and administration. I also formalised the work in a professional article to enable wider dissemination (Kerridge, 2010f)/(Prof06)

I have also served (Est01) on the high profile RCUK Research Organisations Consultation Group (ROCG) which directly influences the ways in which Research Councils interact with Universities and other research organisations.

My role in ARMA and in shaping the profession are described in more detail in sections 3.11 and 3.12 respectively.

2.2.2 Electronic Research Administration

This section gives a brief overview of my contributions to the field of Electronic Research Administration (ERA) in order to provide context for the remainder of the report. The detail on my contributions to ERA in general can be found in chapter 4, with my specific research contributions described in chapter 6 and two areas of ERA practice: Costing and Pricing, and Publication Information are detailed in chapters 7 and 8 respectively.

I have been personally responsible for the development of the research management and administration systems at the University of Sunderland from

1995 to the present (2012) day. Initially RMA processes were supported by spreadsheets, but I soon moved on to developing database driven web based Electronic Research Administration systems. The growth of the ERA systems at Sunderland is charted by Kerridge (2010b)/(ERA22) and described in more detail in (ERA09); they are collectively known as the GRSdB (Graduate Research School Database) and the web interface used to access and manipulate the GRSdB is referred to as GRS On-line.

The context of the GRSdB in terms of the systems that it interfaces with and the organisational units within the University is shown below (see also ERA03). It should be noted that the organisational units and their respective responsibilities within the University are not fixed, but this snap shot gives a good indication of the complexities involved in ensuring that the GRSdB interfaces effectively with other systems within the University.

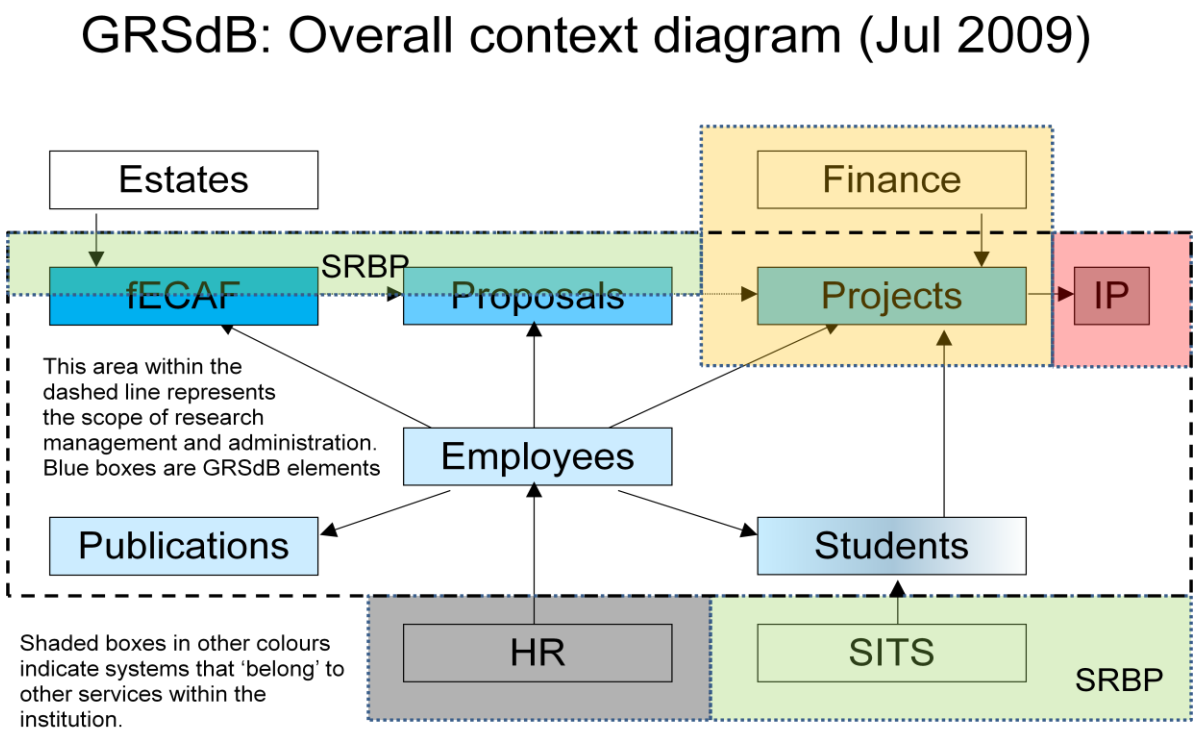

Figure 1: The Context of the Electronic Research Administration at Sunderland (GRSdB)

The underlying structures of various sections of the Graduate Research School Database (GRSdB) can be seen in more detail in the portfolio:

- Employees (ERA52): the core information about people which connects the other elements together, including hierarchical information about Faculties and Departments
- Proposals (ERA53): information about proposals and the [Employees] that are involved in them, linked to [fECAF] for costing and approval for submission
- Projects (ERA53): [Proposals] that are funded become projects and further post award information is stored about funding and [Employees] associated with them
- Publications (ERA54): information about research outputs of all types and the authors [Employees] that produced them – see chapter 8
- Students (ERA55): information about post-graduate research (PGR) students and their supervisors [Employees]
- fECAF [which succeeded GrAppl (ERA56) and has since been superseded by pFACT]: costing and pricing information associated with a [Proposal] including the approval process – see chapter 7

A more detailed field level set of diagrams for the Publications (see section 8.2) and fECAF (see section 7.3) areas can be found in (ERA04); and functional usage information in (ERA42).

In addition to these substantial ERA developments at Sunderland I have also made significant contributions across the UK.

In terms of specific contributions through ARMA, in 2000 when I joined the committee I co-presented at my first event; an expert seminar on using websites for research support (ERA40). This drew on my experience in developing the GRS website, which at that time (Kerridge, 2010b)/(ERA22) provided external viewers with information on academic staff, publications and projects. I also contributed to a residential event in 2008, Research Administration in the Real World (ERA38 & ERA39); led a conference session on Research Systems (ERA18) and a seminar on Systems for Research Excellence Framework (REF) Management (ERA07, ERA09 & ERA60) in 2009; and produced posters on the potential for ERA affecting quality and quantity of research (Kerridge,

2009a)/(ERA23) in 2009 and in 2010 on analysis of the ARMA ERA survey that I undertook (ERA21), see section 5.8.2.

I have also presented on ERA at various other fora, including:

- 2008, Manchester Metropolitan University, fEC systems (ERA63)
- 2009, Repositories Support Project, Electronic Research Administration (ERA14)
- 2010, Welsh Repositories Network, ERA and Institutional Repositories (ERA29 & ERA28)
- 2010, INORMS, Poster on Sunderland ERA systems development (ERA22)

In terms of reaching a wider audience, as well as numerous updates on ERA issues in ARMA newsletters (for example ERA20, ERA35 & ERA36), I have had articles published on aspects of ERA in professional journals:

- 2009, Research Global, article on the Research Council's Outputs Project (ERA25)
- 2010, Research Global, article on ERA at Sunderland (ERA31)

I have also influenced the agenda for ERA systems in the UK, being actively involved in a number of UK-wide initiatives.

In 2002-3 I was one of four 'user' members (ERA50) that guided the requirements for the UKRO IMS project to develop a personalisable web-based information management system to deliver funding alerts and policy briefings on EU funding to subscribers of the UK Research Office (UKRO).

Since 2004 I have been involved with the Research Councils in helping to steer their joint electronic proposal submission system, Je-S. Initially I was nominated as the research organisations (RO) representative on the steering group (Est20) for the development of the system and then I moved onto the management board in 2006 (Est21). This role came to an end in 2011 when the Research Council systems moved into their Shared Services Centre (SSC). My valued contribution to the board is perhaps explained most succinctly in a letter from the chair (Est22). During this time I also undertook an advocacy role and

contributed to a number of Je-S seminars (ERA66, ERA48) and the Leeds submitter pool administration course (ERA77).

I have also been involved in a number of other ERA initiatives, such as:

- UK Research Data Service (UKRDS) Steering Group (Est16 & Est05)
- Research Management and Administration System (RMAS) Steering Group (Est12)
- JISC Research Information Management (RIM) Stakeholder Group (eg Prof01)
- Reviewing JISC RIM round 1 proposals (Est11)
- Reviewing JISC eContent proposals (Est19)
- BRUCE Project Advisory Group member (Est25)

What may prove to have a long lasting influence is my involvement in the development and advocacy of the Common European Research Information Format (CERIF) as the accepted standard for the exchange of research information in the UK. At the JISC RIM meeting (Prof01) that I attended where the EXRI project presented its draft final report summarised in (ERA58), the group agreed that adopting CERIF as the UK standard was appropriate and that JISC would commission a business case (ERA34); I was one of the six interviewees for this report. This resulted in a second round of JISC RIM projects to be called for (ERA37) following some CERIF alignment workshops that I participated in. The main aim of the call was to develop projects that would demonstrate and advocate the use of CERIF for UK ERA systems. I wrote a proposal, IRIOS (ERA43), for this call which was one of only four selected for funding (ERA51). In the same time frame the final phase of the RMAS project was also approved for funding (ERA67); which also advocates the use of CERIF; as well as sitting on the national steering group (Est12) I also lead the Sunderland RMAS Pathfinder project. I was invited to talk (ERA64) at a euroCRIS event in Rome in 2011 and in 2012 I will also present on ERA at the INORMS, ARMA and EARMA conferences. I also led the development of two further current JISC funded projects, see IRIOS-2 (2012) and C4D (2012).

2.2.3 Electronic Research Administration Research

In terms of a specific contribution to research, I have undertaken two related strands of work. One involved looking at the efficacy of the ERA systems at Sunderland by using case studies (see chapters 7 and 8). Issues were identified via focus groups (FG05 & FG02) to identify questions (FG01) for a university wide survey that resulted in a report (FG03) to the University Business Systems Strategy Group to inform future decisions.

The other was a series of UK wide surveys (see chapter 6) into the perceptions of research managers and administrators, and of academic staff, to ERA systems and the effects that they can have on quality and quantity of research undertaken. This work was based on ideas presented as a poster (Kerridge, 2009a)/(ERA23) at the ARMA 2009 conference and a questionnaire (the Workshop Questionnaire, ERAQ08) trialled at a workshop session (Kerridge, Golightly et al, 2009)/(ERA18) that I ran at the same conference. The analysis (Kerridge, 2009b)/(ERAQ03) from that workshop questionnaire suggested that RMAs did think that ERA systems could positively affect research and so a larger on-line survey (the ARMA Questionnaire, ERAQ01) was undertaken, which provided clear evidence (Kerridge, 2010d)/(ERAQ04), (ERAQ05) & (Kerridge, 2010a)/(ERA21) for this view. It also raised the question as to whether researchers themselves had the same view of ERA systems and so I developed a further survey (the UK HEI Questionnaire, ERAQ02) to compare the views of academic staff to those of RMAs. The results of the analysis (Kerridge, 2011a)/(ERAQ06) and (ERAQ07) show that there is broad agreement on the potential positive effects of ERA systems (and indeed Research Management and Administration per se). However, overall members of research staff perceive less potential benefit than their research management and administration counterparts. This work is detailed in chapter 6.

2.3 Summary of my contributions

Since becoming a Research Manager and Administrator (RMA) in 1995 I have helped to develop and shape the profession in the UK. When I joined the then

RAG*net* in 1997 it had around 100 members, by 2011 (as ARMA) membership had risen to over 1,700 (Prof14). Of course just being part of a growing group of people does not substantiate the claim to having influenced it. However, since 2000 I have been an executive committee member (now a director) of the organisation and held various responsibilities over that time including membership and recruitment. Since 2006 I have also been the company secretary. Moreover I have run many workshops and seminars and contributed to many conferences for ARMA and other associations in the research management and administration arena. I was also a founding member of the NE-ARMA group which ran a series of institutionally focussed workshops for RMAs in the North-East region of England (Prof18).

The portfolio (see chapter 11) provides evidence for these claims and indicates the impact that they have had. There is also more detail on my role in shaping the profession in section 3.12.

My contributions specifically to Electronic Research Administration (ERA) in the UK have their roots back in my days as a computer science researcher (1990-1995) where after my degree and running a software consultancy for three years I honed my skills as a systems developer. When I moved into Research Management and Administration it was natural for me to use these skills to improve the associated processes and information availability at Sunderland. It did not occur to me that this might be something novel; but few other Universities in the UK were using electronic systems for research administration at that time. The systems that I developed are outlined in section 4.5 and their impact discussed in section 4.6. Two aspects of the systems are described as case studies: costing and pricing in chapter 7; and publication information in chapter 8.

I have run ERA sessions for ARMA, euroCRIS, HEFCE, RSP and WRN, and presented my work at conferences and had articles appear in various publications. I have also served on a number of national bodies for ERA related activities, and have given help and advice to staff at other Universities on aspects of ERA. I co-ordinated the submission of and led three JISC funded ERA projects (IRIOS, see ERA43), the follow on IRIOS-2 (IRIOS-2, 2012) project

and the related C4D (C4D, 2012) project. I sit on the national RMAS Steering Group (Est12) and lead the Sunderland Pathfinder part of this HEFCE funded (ERA67) project. I am a member of the JISC supported Research Information Management stakeholder group (Prof01) and sat on the advisory board for the BRUCE project (Est25). Perhaps most influentially I have worked closely with various Je-S teams in the 2004-2011 period including serving on the Je-S Steering Group (Est20), the Je-S Management Board (Est21) and the Joint Grants Processing (JGP) Steering Group (ERA74).

Again, the portfolio (see chapter 11) has further evidence of these contributions to ERA in the UK and further afield. There is also more detail in sections 4.5 & 4.6 of my contributions and impact in the field of Electronic Research Administration (ERA).

3 THE RESEARCH MANAGEMENT AND ADMINISTRATION PROFESSION

Research Management and Administration (RMA) is a fledgling profession, or perhaps more accurately, as espoused by Etzioni (1969), a semi-profession. This bold statement requires much justification and indeed definition, which this chapter presents. My contributions to the development of RMA as a profession will also be provided and reflected upon.

3.1 A definition of RMA

I have specified 'Research Management and Administration' (RMA) as the title of the profession (and we shall see that it is one), however this is not a universally agreed title. As discussed in the section on associations in section 3.10 below, much of the early activity was in North America, where the word 'administration' has a less pejorative meaning than that in the UK. Quite often an administrator in the UK holds a lowly position, with that of manager being automatically assumed to be a higher role; although not always deemed in a positive light, (Whitchurch, 2007). The case is somewhat different in North America, where for example 'the administration' refers to the government as a whole and the word 'administrator' can often refer to a high ranking person. The two main RMA associations in the USA are the National Council of University Research Administrators (NCURA, 2010) and the Society of Research Administrators (SRA, 2010) International. However in much of the rest of the world the term 'manager' has more cachet and many other associations use the phrase Research Managers and Administrators in their titles. As the wordier version subsumes the shorter alternative, I will use Research Management and Administration as the title of the profession, which also sits better with a UK audience; and indeed has been used by Poon (2005). This fits closely with the views of Shelley (2010) who discusses the changing roles of research managers and research administrators, and also adopts the RMA acronym. It should perhaps be noted that both Dr Louise Shelley and I

are members (and indeed currently directors) of ARMA, the UK association for research managers and administrators, and so our views may be been informed by the name of our chosen association.

So (given the above proviso) what is a Research Manager and Administrator? As Collinson (2007, p.297) points out "there is no one simple or standard occupational definition of what a research administrator does". However, there have been many definitions:

(Beasley, 2006, p.9): *"... [those providing] the support required for success in research program[me]s."*

(Chronister and Killoren, 2006, p.59): *"... someone who leads, manages or supports the research enterprise."*

(Kirkland, 2008, p.718): *"… an activity instituted at the level of the institution, which seeks to add value to the research of academic staff, without being part of the research process itself."* This definition is actually for 'research management' and emphasises the institutional level element so as to differentiate it from local research management which a researcher might (have to) undertake themself.

(Stackhouse, 2008, p.8): *"... embraces anything that universities can do to maximise the impact of their research activity. It includes assistance in identifying new sources of funds, presenting research applications and advice on costing projects and negotiating contracts with external sponsors. It incorporates project management and financial control systems. It also involves help in exploiting research results – through commercialisation, knowledge exchange and dissemination to wider society".*

The last is interesting as it is from the initial results of an international survey by the Association of Commonwealth Universities (ACU, 2010) through their Global Research Management Network (GRMN, 2010) initiative into research management as a profession. The definition was put forward and was agreed to by 85% of 320 respondents (mainly from Africa, Australasia and the UK). The first two definitions, from a North American perspective, are somewhat more succinct.

There are many lists of tasks that RMAs undertake; most of the RMA associations have such lists. For examples of UK centric ones see Carter and Langley (2009), Green and Langley (2009) or Langley (2008). However, whilst useful in terms of providing a scope for the RMA profession, they are too unwieldy for a definition. Whereas the Beasley definition is positive the Chronister and Killoren one gives a little more shape and is preferred. So the definition I have adopted is:

Research Management and Administration [RMA] is ***the leadership, management or support of research activities***.

Whilst this definition does not provide much over the title itself it does indicate that the levels of responsibility can encompass the whole of the spectrum, which as well as being a good basis for a profession also enables us to see Research Management and Administration as a career option.

3.2 Blended Professionalism

The above definition might give the impression that Research Management and Administration is a job, whereas often it is a role; part of a job. For example a departmental administrator might have RMA as only one part of their duties. From a blended (Whitchurch, 2009) perspective it is natural for academic staff and researchers to undertake some of the functions of RMA within their jobs. There has also been movement by professional staff into this shared 'third space' with academic staff (Whitchurch, 2008b), also referred to as the 'shifting arena' by Shelley (2010). Deem (2010) notes that this is the case for many RMAs working in universities. Similarly, Marlin (2009) describes the increasingly commonplace role of 'research facilitators', who work with academic staff to increase research productivity.

It seems clear then that as well as something that might define a job, RMA is also something that staff might undertake as a part of their duties and this is particularly interesting when the other part includes research activities themselves. This provides an opportunity for academic and research staff to

move into research management and administration (Collinson, 2007) and for RMAs to move into the research arena (Bassnett, 2004).

Whitchurch (2006) develops the concept of a professional manager (as distinct from an academic manager such as a dean) but sees them working together in this 'third space' and indeed moving from one camp to another or having dual academic and professional management roles. The latter is seemingly more common in senior roles (Whitchurch, 2008a) which leads on to the concept of leadership; again this can be academic and/or professional leadership. The benefits of good (and appropriate) leadership in higher education are clear (Bryman, 2007) and this is no different for the field of research management and administration (Whitchurch, 2006), whether from an academic or a professional stance (and perhaps increasingly, both). A discussion of research leadership is not included here, but in the context of the concept of the blended nature of research management and administration it does provide a possible pinnacle of various possible career paths (Whitchurch, 2008a).

Thus, it is important to remember that when referring to RMAs, we are also including those whose partial role is that of research management and administration, as well as those whose entire role is devoted to research management and administration. The former may be administrative and professional members of staff that have a wider remit as well as those in the third space who actually undertake research themselves. Indeed it is difficult to imagine a researcher who does not at some time undertake the functions of research management and administration. However, in general, when referring to RMAs the intention is to include those people who identify themselves primarily with research management and administration, rather than it being a secondary function of their role. The blurring (or blending) of research and RMA in the third space is discussed by others (Whitchurch, 2008b; Deem, 2010), and is not the focus here.

3.3 Critique and analysis of the recent discussions of the role of research administration in Research Fortnight

It is however perhaps relevant to reflect on the tensions that can occur in this third space where RMAs and academic staff work together or perhaps sometime against each other. This topic was addressed in the counterpoint articles in Research Fortnight by Colquhoun (2010) and Kerridge (2010g)/(Prof08) on the role of research managers and administrators which raise a number of issues about the profession. It should be noted that the Kerridge article was written first, then the Colquhoun one developed as a response, finally a few days were allowed for the Kerridge article to be updated in light of the Colquhoun one. It should also be noted that Kerridge is also the author of this doctoral report and so whilst the author has striven to be objective the reader should take particular care when drawing conclusions from this section.

Both articles are opinion pieces and might also be described as opinionated, but by drawing back from the specifics of the exact text and looking at underlying philosophy the following is proposed.

Kerridge makes the case that researchers should not be burdened with administration and that this duty might best be carried out by administrators. Similarly, strategic decisions should be the realm of managers, be they academic or professional. He argues that there may well be an additional administrative burden when compared to a few decades ago, but that this is due, at least in part, to things that have gone wrong in the past. An extreme example would be the Alder Hey scandal (House of Commons, 2001) that resulted in a number of recommendations and as a direct result the Human Tissue Act was updated in 2004 with the Human Tissue Authority regulatory body coming into being a year later.

The key message is that researchers should be supported by research managers and administrators to do what they do best, research; unless researchers are happy to perform these tasks themselves, as Colquhoun suggests. He sees (most) RMAs as an encumbrance rather than as a support.

Colquhoun's main argument appears to be that RMAs are an added layer of bureaucracy that should not be required, but he does recognise that niche expertise (such as costing and pricing) could be an aid to researchers.

Colquhoun also worries about the strategic aims of institutions and whether or not this means that scientists should follow the orders of non-scientists. This issue of academic freedom is certainly a thorny one and will not be easily resolved, but institutions (such as Colquhoun's own) do base their strategies on academic excellence. An example of a strategic aim from University College London (UCL, 2011, p.4) is that "The excellence – of all kinds and across all disciplines – of its staff and their research activity is a prerequisite for the delivery of UCL's research vision", so perhaps Colquhoun's fears in this respect are unfounded.

In summary, the rising number of RMAs is seen by Colquhoun as a threat and a drain on resources, whereas Kerridge sees this dedicated resource as an opportunity for researchers to concentrate on research and not have to dilute their efforts on administration. The latter position is supported by Bassnett (2004, p.1) who's opinion is that "it's thanks to administrators that many people have won research grants"; similarly Aldridge and Derrington (2012) advocate that applicants should work with research administrators to utilise their expertise on matters such as costing and pricing, approval processes and legislative issues. This is also supported by the UCL (2011, p.9) Research Strategy Consultation "UCL will continue to develop supportive administrative and financial structures that will facilitate and underpin research, enabling academics to use their research time to maximum effect".

These differing viewpoints are perhaps a manifestation of the problem of the excluded middle. On the one hand we have academic staff undertaking research and on the other we have RMAs who are tasked with supporting this research activities. Neither author has clearly articulated that as well as being a full time job research management and administration can be a role, that is, part of a job. In some cases an administrative job might include RMA as part of the duties. Often academic staff do undertake RMA as part of their duties, and Colquhoun alludes to that, whilst Kerridge is silent on the subject. This type of

quasi-academic role in the ‘third space’ on the blurred boundaries of academic and professional roles is defined by Whitchurch (2009) and often seen in senior RMAs (Deem 2010), as discussed in section 3.2.

However, the question arises as to who is best (or best placed) to undertake the RMA role which both Kerridge and Colquhoun do acknowledge is needed. The UCL strategy wishes to provide administrative support for researchers to enable them to do what they do best – research. Undoubtedly the position is not black and white though; there are no doubt many excellent researchers, who are also excellent research managers and administrators. It is however suggested that there are many more either whose forte is not management and administration, or perhaps more tellingly, whilst they might potentially make excellent research managers and administrators they much prefer to spend their time doing research (Metcalf et al, 2005; Deem, 2010) and possibly do so to the detriment of the former.

Colquhoun finishes by suggesting that the economic downturn be used as a driver for ridding universities of the various “hangers-on” that he has identified, summarising that “If you want research, spend money on people who do it, not those who talk about it”. Whilst the spirit of this statement is hard to argue against there is a major problem with it; research cannot, in general, be done in isolation (Sawyerr, 2004). Researchers would find it difficult to undertake research without any facilities, such as a building, electricity, access to the internet, a library account, materials for experiments and so on; and the resource to ensure them into the future. I would argue that his concluding remark should be recast “If you want research, spend money on ***supporting*** people who do it”. This includes of course spending money on those that do undertake research but also on the various infrastructures that allows them to do so in an efficient and cost effective manner; and I would include research managers and administrators under that banner. The raison d’être of RMAs is after all, as Colquhoun indicates (albeit to make a counterpoint), to “facilitate excellence in research”.

Research Management and Administration (RMA) has been defined in section 3.1 and the blurring of this grouping with academic staff discussed in section

3.2, together with a manifestation of the tensions that this relationship can cause, above. The following sections return to the issue of RMA itself. Following a discussion of what constitutes and defines a profession in sections 3.4 and 3.5 and a community of practice in section 3.6, RMA is argued to be a profession (in section 3.7). The scope of professions is the considered in section 3.8 and for RMA this is aligned with the Association of Research Managers and Administrators (ARMA), see section 3.9.

3.4 What is a Profession?

In his seminal work on the professions Perkin (1989, p.16) introduces the idea of the development of the professions with the ultimate ambition that they would *"... not accept a market valuation of their skill but demanded that society should accept their own valuation, guaranteed by exclusive education and certification."* However he also acknowledged that many professions did not meet this lofty aim but instead *"compromised by means of a negotiated salary scale and a stable lifelong career"*. This is clarified with the differentiation that Turner and Hodge (1970) and Etzioni (1969) introduce between professions, semi-professions and indeed professionalization per se.

Perkin also introduces the potential difference between members of professions in public and private bodies, with the former being driven by status and a belief that the service is so crucial that it must be provided for by the state for the benefit of all and the latter being focussed on value and a belief that the service is so crucial that those needing it will pay for it. On the face of it these positions appear opposed (and indeed Perkin argues such), however in the public-private partnership mixed economy of the early 21st century many public bodies including universities are being urged by government to become more entrepreneurial (Etzkowitz, Webster et al, 2000), (Middlehurst, 2004). It can be argued that even within a university there can be an internal market calling on professional services (Santos, Heitor et al, 1998). In either case it can be seen that it is advantageous for a group of people doing similar tasks in various organisations to consider their professionalism.

Looking at this from the pragmatic perspective of a developing profession, Evetts (2003, p.407) perhaps best encapsulates this with *"The ideology of professionalism that is so appealing to occupational groups and their practitioners includes aspects such as exclusive ownership of an area of expertise and knowledge and the power to define the nature of problems in that area as well as the control of access to potential solutions"*. Whilst this sounds a little insular it does reflect the issue that when a certain depth of knowledge is required for a function there is a fear amongst practitioners that other (perhaps more powerful) actors will make decisions based on misinformation. One good way of combating this is to provide the correct information, but this may not be heeded if the provider is not trusted and respected – a 'profession' addresses this issue.

3.5 Definition of a Profession

Whilst Perkin (1989, p.3) does not specifically define a profession, he does state that *"As more and more jobs become subject to specialized training and claim expertise beyond the common sense of the layman - and all professionals are laymen to the other professions - their occupants demand the status and reward of a profession"* and (Perkin, 1989, p4) that *"The professional ideal, based on trained expertise and selection by merit, differed from the other three in emphasizing human capital rather than a passive or active property, highly skilled and differentiated labour rather than the simple labour theory of value, and selection by merit defined as trained and certified expertise".* From this we can propose the following characterisation:

A profession is an area of endeavour whereby members gain certified expertise from training and experience at a level which is beyond that of a layman.

Haynes (2003) is largely in agreement with Perkin in terms of the motivations for professionals and builds on these but muddies the waters by highlighting the tension between managers and professionals. Whilst much of Perkin's work is described in terms of public administration, Haynes focussed specifically on the public sector and argues that it is more complex than the private sector. This builds on the ideas of Exworthy and Halford (1999) who introduced the

concepts of New Managerialism (based on New Public Management) and the managerial professional, occupying the complex overlapping world between being a manager and being a professional. The premise that a professional needs to have specific in-depth knowledge is well documented, but it is also clear that a managerial professional also needs to have a wide range of skills.

Another definition, from Professions Australia (1997, p.1) is: *"a disciplined group of individuals who adhere to ethical standards and who hold themselves out as, and are accepted by the public as possessing special knowledge and skills in a widely recognised body of learning derived from research, education and training at a high level, and who are prepared to apply this knowledge and exercise these skills in the interest of others. ..."*

This definition is almost equivalent except that there is no requirement for the knowledge, expertise and skills to be certified.

Further, Starr (1982) uses three characteristics to define a profession, which others have paraphrased as a 'learned profession': autonomy, authority and legitimacy. Clearly RMA falls short of being a learned profession in a number of ways: there are few self-employed RMAs (autonomy), and in terms of training, that currently required in order to be an RMA is neither formal nor prolonged (authority), so RMA cannot claim to be a learned profession. However, he also indicates that an occupation that is self-regulating with required training in specialised knowledge and, crucially, is service rather than profit oriented may be considered a profession; RMA in the UK is certainly on that trajectory. Echoing Kulakowski and Chronister (2006) in the USA, Green and Langley (2009, p19) conclude that 'many people just "fall into the career"' whilst noting the requirement for a professional training framework for RMAs. Garnett (2011) outlines the plans for the development of just such a professional development framework which was launched in 2011 (Garnett and Golightly, 2011).

Goode (1969) identified ten traits of professionalism; he specifies the two core generating traits as being a basic body of abstract knowledge, and the ideal of service, the implication being that these are pre-requisite for a semi-profession.

Looking at the issue from a professional doctorate viewpoint Lee (2009), argues that Eraut's (1994) approach of defining professional ideology rather than professions per se is more realistic. She reports his three main features of specialised knowledge, autonomy of practice, and service provision.

As we will see, RMA does meet the criteria for a non-learned (or semi-) profession, and whilst certification (in the UK) is not robust, this is no barrier to RMA being considered as a semi-profession. From a practical point of view RMA certainly has Eraut's (1994) professional ideology and the next section will consider a less formal grouping of professionals; a community of practice.

3.6 RMA: A Community of Practice

When considering the history of Research Management and Administration (RMA) in the UK, there is not much literature to draw on. The main association in the UK has produced a short report (Taylor 2001) on its first ten years (1991-2001). Comparing this account of RAG*net* (as it was then called) with the criteria set out by Wenger (1998) for a 'community of practice' - mutual engagement, a joint enterprise, and a shared repertoire; more clearly defined in Wenger (2006, p.1) we see:

- The domain: there is a shared common interest (research management and administration)
- The community: it is the case that *"members engage in joint activities and discussions, help each other, and share information"*
- The practice: the members are practitioners and the shared practice ranges from networking to the collection of a knowledge base

So it is argued that RMAs in the UK clearly constitute a community of practice. Further, there are various sub- and super- communities; respective examples are those specifically interested in Electronic Research Administration (ERA), see (ERA49), and wider geographic groupings such as the European Association of Research Managers and Administrators (EARMA, 2009). In fact Wenger could correlate the ERA group as a community of practice and RMA as a whole

in the UK as a constellation of practice which can in some ways be equated to a (semi-) profession.

Whilst it is perhaps sufficient to look at the impact of my work on a community of practice, it is argued that research management and administration is a profession in development, and that I have positively influenced that progress.

3.7 RMA: A Profession

In recent years the term semi-profession has not been widely used and so it is argued that the term profession is now used in its place and that the original professions are now differentiated by terms such as learned professions.

In North America Kulakowski and Chronister (2006, p.xxv) noted that *"Each year, hundreds of men and women enter the profession of research [management and] administration. Many of them do not even realize that they are joining a profession!"*

From this and the long histories of NCURA (Roberts et. al., 2008) and SRA International (Myers, 2007), it is argued that in North America at least RMA is seen as a profession. Campbell (2010, p.40) indentifies the period 1990-2009 as when it evolved into a "truly separate profession". Indeed it meets the strictest of the Perkin's definition in that one can become an independently (RACC, 2009) Certified Research Administrator (CRA). Outside North America, Kirkland (2008, p.720) believes that *"a new 'research management profession' has emerged"* (whilst referring to what I have defined as research management and administration).

In the UK, (ARMA, 2010) defines itself as the professional association of research managers and administrators, which certainly meets the self-definition principle. Perhaps more tellingly ARMA is listed on the UK HM Revenue and Customs[1] website under 'professional bodies and learned societies, approved by the Board under Section 201' for the purposes of membership fee tax exemption.

[1] http://www.hmrc.gov.uk/list3/list3.htm, accessed 30th April 2011

So it is reasonable to conclude that RMA is seen as a profession in both the UK as well as further afield in places such as in North America. Indeed a recent history (Walcott, 2011a) of the second ten years of ARMA has argued just such a case for the UK.

3.8 Scope of a Profession

How is the scope of a particular profession defined? For example RMAs could be considered to be a sub-set of University Administration, as supported by the Association of University Administrators (AUA, 2009), but the AUA is focused on higher education and not all RMAs work within a University context. There is perhaps another reason why the AUA has not met the needs of RMAs, if we consider RMA to be a developing profession then it is quite possible for it to be difficult for those advanced niche needs to be met by a general administration association.

It can be argued that the scope of a profession is self defining, for example in Collins, Dasgupta et al. (2009) King describes how counselling grew up as a profession separate from psychiatry. Those who undertake the core activities will consider themselves (or aspire to be) part of that profession. Those on the fringes will either join the profession, if it meets their needs, or start another, related profession; for RMA such a schism is described by Taylor (2001) in the history of the first ten years of RAG*net* (now ARMA). Taylor (2001, p.1) recounts that Rosemary Goodwin, one of an initial group of RMAs dissatisfied with the suitability of existing training and development provision, wrote that "we have more in common with other research centre administrators than with our own university departmental support staff", over the next few years they formed their own association to meet their own needs and RAG*net* was born. Goodwin's view is reflected in the work of Collinson (2007, p.307) where she describes RMAs as having "a distinctive occupational identity".

The following sections will consider various RMA professional associations starting with the Association of Research Managers and Administrators, ARMA.

3.9 The Association of Research Managers and Administrators (UK) – ARMA

In the UK there are a number of associations of and for Research Managers and Administrators and there are yet more around the world. Additionally there are other associations which either subsume or overlap with the interests of research managers and administrators as defined. Rather than just providing a list of such organisations it is useful to reflect on why and how they developed.

Arguably the most important association in the UK is (ARMA, 2010), the Association of Research Managers and Administrators, which in 2011 had over 1,700 members (Prof14). It was formed in 1991 when, before rebranding, it was called RAG*net* and produced an interesting account of the first ten years (Taylor, 2001) of its existence, charting the progress in terms of events, profile and membership increase to 350 by the year 2001. This was followed by a history of the second ten years (Walcott, 2011a) and a timeline of the first 20 years of the association (Walcott, 2011b) that I commissioned.

RAG*net* grew out of DORCISS (the Association of Directors of Research Centres in Social Sciences; now the Association of Research Centres in the Social Sciences (ARCISS)) as a Group specifically for Research Administrators (RAG). In the early years, although there were only a few tens of members, they were relatively active, presenting at the international Society of Research Administrators (SRA, 2010) conferences, and helping to instigate the European Association for Research Managers and Administrators (EARMA, 2009), the relationship was cemented in 1997 with the formal recognition as sister organisations. There were also a number of joint initiatives, including with the association of Higher Education European Officers (HEURO, 2009), the Association for University Research and Industry Links (AURIL, 2009) and the UK Association of University Administrators (AUA, 2009).

1998 was perhaps a pivotal year with the introduction of a new website and the annual 2-day introduction to research administration Induction Course for new research administrators, with the former providing an on-line resource for members and the latter being the first step towards certification of professional

skills for RMAs with the availability of a recognised course that was repeated (and updated) periodically.

It can be seen (Taylor, 2001) that RAG*net* and thence ARMA was formed from dissatisfaction from then available professions and associations. The fact that it has gone from strength to strength only goes to support the contention that in the early 1990s there was no organisation that met the needs of UK research managers and administrators.

3.10 The RMA association landscape

We have seen how ARMA has grown up from and with a number of organisations, but there are many other noteworthy associations that should be considered in order to have a complete picture of the RMA profession.

It often seems that in recent years many things have started in the United States of America and then spread to the rest of the western world – things are no different in the arena of research management and administration. In 1959 the National Council of University Research Administrators (NCURA, 2010) was formed, and was followed by the Society of Research Administrators (SRA, 2010) in 1967 and then the Canadian Association of University Research Administrators (CAURA, 2010) in 1971. It was not until a further 20 years later in 1991 that RAG*net* was formed in the UK.

3.10.1 Internationalisation of RMA

It can be argued that the internationalisation of research management and administration began in the 1990s when the US based Society of Research Administrators started adding the word international to its name and then formally renamed itself in 2000 as the Society of Research Administrators International; see Beasley (2006) for a more detailed account of the development of the SRA. However in the ensuing ten or so years, not much progress has been made. Notwithstanding membership being drawn from 33 countries, of these 4,000 (as of Oct 2010) only around 5% are from outside the United States, and most of those are Canadian. It is perhaps understandable that professionals would look to form their own local groupings rather than join

an association based in another country with different rules and regulations for research to contend with.

So it was not really until a number of national organisations were active, culminating in the formation of the International Network of Research Management Societies (INORMS, 2010) in 2001 that we can really say that RMA as a profession has gone worldwide. Currently, in 2012, INORMS has 11 member organisations from around the world: UK (ARMA) and (PraxisUnico), Australasia (ARMS), Canada (CAURA), Denmark (DARMA), Europe (EARMA), USA (NCURA) and (SRA International), Southern Africa (SARIMA) and West Africa (WARIMA), with biennial international conferences. It should be noted that the Global Research Management Network (GRMN) managed by the Association of Commonwealth Universities (ACU) is also a member.

The GRMN is perhaps the most international of all these associations with over 400 members drawn from 49 countries, however the scope of its membership may also be a weakness, and it is suggested that members see the GRMN as secondary to their national association if they have one.

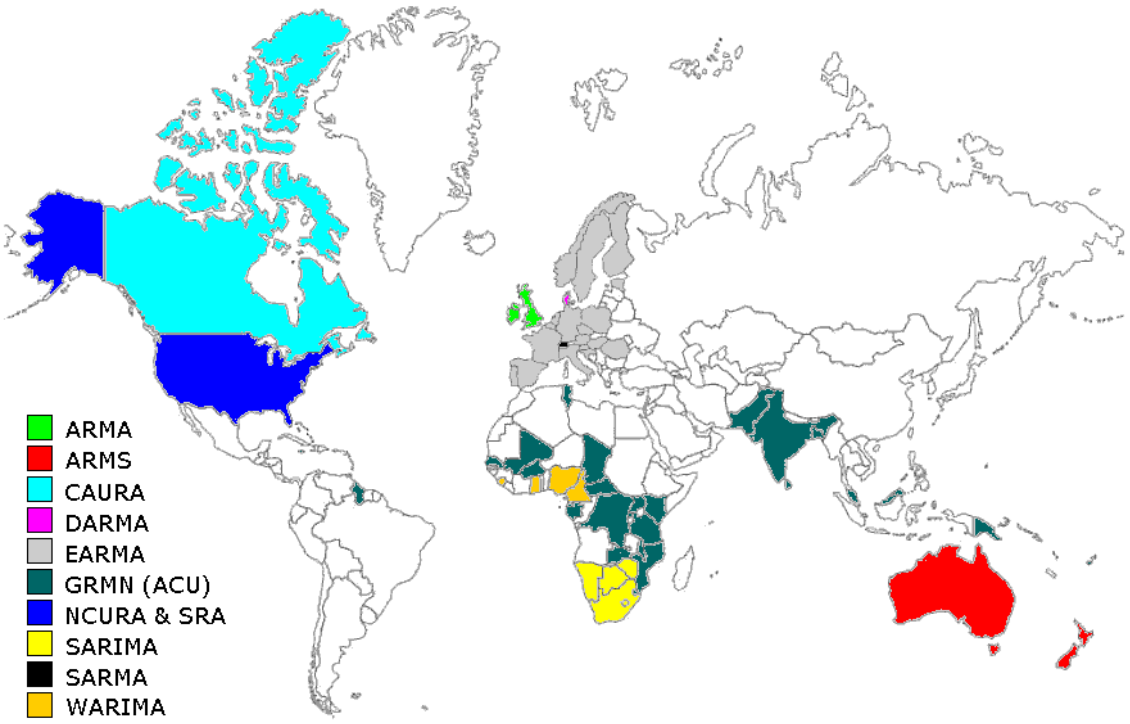

Figure 2: World Coverage of INORMS Associations (2010)

It can be seen from Figure 2[2] (where countries are coloured in relation to the association that claims most members from it) that whilst INORMS has a good international coverage there are still areas such as South America, Russia, the Middle East and the Far East that are not included in the INORMS family of associations.

3.10.2 Associations related to RMA in the UK

In the UK in 2012 the picture is rather complex. The largest association is the AUA with 4,000 members, but the remit is very broad and research support is only one of 13 listed areas. Similarly AURIL (membership by organisation) covers research and knowledge transfer and has been much more active in the latter with the recent setting up of the Institute of Knowledge Transfer (IKT, which has individual membership and accreditation), promoting Knowledge Transfer as a profession. In terms of membership (1,700) ARMA is certainly the driving force for RMAs in the UK, but is by no means the only one. There are more niche associations such as the ARCISS and the UK Research Office (UKRO, 2010) which offer membership to organisations and provide training and development for research administrators in the areas of social sciences and European funding, respectively. PraxisUnico also has organisational membership and is interesting as it is the product of the merger (in 2009) of the Praxis training company and the University Company (UniCo) association for research commercialisation, the latter having previously contributed to the formation of the former in 2002. It could be argued that now is the time for a rationalisation of the plethora of related and interrelated associations, indeed it is possible that an accreditation framework (agreed upon by all the stakeholders) would be the catalyst for them working more closely together as advocated by Green and Langley (2009); and this work is now underway (Garnet and Golightly, 2011).

In summary we can see that the landscape of Research Management and Administration related associations is somewhat complex, and whilst there is

[2] PraxisUnico joined INORMS after the map was constructed; most of its members are from the UK, however it has fewer members (these are institutional rather than individual) than ARMA and hence the colouring is still accurate

accreditation in the related field of Knowledge Transfer, the accreditation of RMA professionals working in research support is only, at this stage, implicit.

For RMA to become a fully fledged profession, such accreditation should be developed within a national framework. ARMA and other organisations already run training courses and events which cover the range of required skills. In 2010 ARMA employed a professional development manager specifically to develop an agreed national framework (Garnett, 2011)/(Prof24) for the profession of Research Management and Administration. The initial framework is now in place (Garnet and Golightly, 2011) and this is the first step towards accreditation of RMAs in the UK.

3.11 My Place in ARMA

Much as Taylor (2001) describes the problems that Joan Hughes had back in 1986 with the suitability of non RMA specific training and development, when I became a Research Manager and Administrator in 1995 in a University that was developing its research profile (and hence research support) I found that I had no peers within my employing organisation. In my first few years I attended a few events run by different organisations including AUA, AURIL and RAG*net*; and found that the RAG*net* ethos best met my own and I became a member in 1997.

At the 1999 RAG*net* conference (spring workshop as it was then) in Lancaster I happened to share a dinner table with Nigel Bilsbrough, the then secretary of the association, and also spoke with Steff Hazlehurst, another committee member who was busy developing the website. As is normally the case at conferences I became enthused with the idea of doing more and almost stood for election the following morning, in the end I decided against standing without first feeling the water, and waited until the following year.

I was voted on to the executive committee in 2000 (ARMA41), re-elected in 2003 (ARMA34) and then elected to the position of company secretary in 2006 (ARMA32) and again in 2009 (ARMA26). During my time on the RAG*net*

committee and as a director and company secretary of ARMA I have made many contributions to the profession, which are outlined in section 3.12 below.

Whilst the aim of RAG*net* has always been to professionalise RMA, it is argued (Walcott, 2011a) that the strategic decision to change the name of RAG*net* to ARMA with effect from 2005 heralded the starting of the development as RMA as a profession in the UK and that ARMA is the professional body of the profession. ARMA training courses are currently only self certified and cannot claim to fully meet the needs of the fledgling profession. This was re-iterated at a recent event where the final report of the HEFCE / MRC funded "Professionalising Research Management" project (Green and Langley, 2009) was launched, with much interest from the audience in doing so. I have been part of the larger ARMA team that has taken up this mantle and is helping to develop a professional development framework for research managers and administrators (Garnett, 2011). With the approach being to identify the knowledge and skills that RMAs need at various levels in their careers with the aim of identifying a suite of accredited development opportunities for the profession. This framework now exists (Garnet and Golightly, 2011) but so far only preliminary discussions about accreditation have taken plave.

3.12 My Role in shaping the RMA Profession

Since becoming a full-time Research Manager and Administrator in 1995 and subsequently joining RAG*net* in 1997, I have made many contributions to the development of the profession in the UK. The overview of my contributions outlined in section 2.2.1 is expanded upon here and evidenced in the following sections.

In the year 2000 I put myself forward for nomination and was elected (ARMA41) to the RAG*net* executive committee, becoming one of the up to 17 people who led the association. Over the following 12 years I have been involved with and led a number of initiatives that have helped to professionalise the association and hence the profession in the UK, see Walcott (2011a). This section focuses on my role in the development of RMA as a profession rather than contributions

that I have made to Electronic Research Administration (ERA) which are described later, in section 4.8.

3.12.1 My Role in ARMA

All of my contributions to the development of the profession of Research Management and Administration have been due to my involvement in ARMA (and before that RAG*net*), even if sometimes only indirectly. I joined RAG*net* in 1997 and was elected (ARMA41) to the executive committee in 2000 when the membership numbered around 250. Terms of office are generally three years and so I stood again and was re-elected in 2003 (ARMA34) with responsibility for membership and recruitment which then stood at just over 400. The committee agreed that the burden placed on committee members and their goodwill in giving up their free time for the association was too great and that changes need to be made to professionalise the association. We wished to develop and roll out a series of training courses for RMAs at all levels which we hoped would increase income and attract new members; however in order to do this we needed permanent administrative assistance which would cost money - a catch-22 situation, which is described in Walcott (2011a). Over the following years we introduced group membership which enabled heads of research offices to easily pay membership fees for their staff on a single invoice, we also expanded the number of individual members by promoting the association to research offices and individuals newly in post, I was responsible for directing these activities over that period, which combined with the rebranding of RAG*net* into ARMA saw the association grow by 100% over two years to a membership level of 800 by 2005. In 2006 I stood for and was elected to the position of company secretary and director (ARMA32) of the newly formed company limited by guarantee (CLG) that provides the legal basis for ARMA. In 2009 I re-stood and was again elected, for my fourth term (ARMA43). In 2012, membership of the association stands at over 1,700 and ARMA is recognised across the sector as the representative body for research managers and administrators; see for example (ESRC, 2011, p.10) and (RCUK, 2011, p.5). I can certainly claim to have played a key role in the development of ARMA as an association and hence the development of RMA as a profession in the UK.

3.12.2 My Contributions to ARMA

During my time as a committee/board member I have made many contributions to the association, over and above my current duties as company secretary. For example I produced feedback reports from various conference sessions (ARMA19, ARMA20, ARMA21, ARMA22 & ARMA23) and indeed organised two annual conferences (a task that is now one assigned to a dedicated director), see section 3.12.6. Underpinning all of this I have played an active role in the various committees and planning meetings since 2000 that have defined the direction of travel for the association (Walcott, 2011a). I am active in promoting Research Management and Administration as a profession and, for example, wrote the noteworthy piece in Research Fortnight (Kerridge, 2010g)/(Prof08) contrasting the roles of researchers and research administrators; it was the subject of the editorial in the following edition (Mahsood, 2010)/(Prof07) and a critique is provided in section 3.3. I also played a major role in managing the development of the new (2008) database driven website for the association and champion the ERA special interest group as well as running a number of seminars and workshops. These various contributions are expanded upon in the following sections.

3.12.3 ARMA Professionalising

Over the years I have been an active contributor at board meetings and have in particular argued for a calendar of training and development activities and events. This is now coming to fruition with the appointment of a Professional Development Manager in 2010, initially on a one year contract to research and define the skills and knowledge that RMAs need across a range of activities at three levels of responsibility. Whilst not directly involved in the appointment process I helped to develop the project plan and have of course played an active role in helping to define the framework (Garnet and Golightly, 2011). In 2011 the ARMA board agreed to extend the post to 3 years in order that the post holder could actually develop content and construct a calendar of events.

At the INORMS 2010 conference in Cape Town I presented (Prof02) a paper on developing a national training framework for RMAs in the UK. The interest in

the session led me to arrange an impromptu meeting (Prof12) at the conference for those colleagues from around the world interested in sharing good practice in professional development. This was followed up after the conference (Prof13) and should provide a useful avenue for exploring the possibilities of internationalising the ARMA professional development framework.

3.12.4 ARMA Events

Over the years I have presented on many topics for RAG*net*/ARMA, for example:

- 2003, National Science Foundation (USA) Funding, (ARMA35)
- 2004, Supporting Research Proposals (ARMA38 & ARMA39)
- 2006, Supporting Research Proposals, updated for fEC (ARMA40)
- 2007, Full Economic Costing, run twice (ARMA28), (ARMA33)
- 2008, Mentoring (ARMA29)
- 2008, Research Council Funding (ARMA30)
- 2008, Post Award Finance (ARMA44)
- 2009, Post Award Finance; run twice (ARMA45) and (ARMA05)

This wide portfolio of topics that I have covered over the years gives an indication of the breadth of my experience in the research management and administration arena. I have also talked on and presented posters on many aspects of Electronic Research Administration which are detailed in section 4.8.

3.12.5 Non-ARMA Events

I have also presented at many non-ARMA events on aspects of research management and administration:

- 2002, How research is funded, AUA conference (Prof25)
- 2005, fEC for commercial activities, AURIL (Prof23)
- 2009, Repositories Support Project summer school (ERA14)
- 2010, Vitae panel session (Est17) and (Est15)
- 2010, Developing a national training framework, INORMS Conference (Prof02)

- 2011, BRAM-NET conference for research managers and administrators at Brunel (Prof21)

I was invited to run a workshop at a UKCGE event (Est09) in 2010, but was unable to do so; however I managed to arrange a group of other speakers from ARMA to run the workshop in my stead. I have also talked on many aspects of Electronic Research Administration at non ARMA events, which are detailed in section 4.8.

3.12.6 ARMA Conferences

In terms of major events, after the person who initiated the process went on maternity leave, I organised the logistics for 2001 RAG*net* Spring Workshop in Newcastle and finalised the programme (ARMA46). The 'conference' attracted nearly 100 delegates. I also produced the report for European Commission workshop session on working with funders (ARMA19) for the benefit of the wider membership.

I led all aspects of the 2004 RAG*net* Spring Conference in York, including securing Dr Ian Gibson, Chair of the House of Commons Select Committee on Science and Technology for the keynote presentation (ARMA47). The conference attracted nearly 180 delegates and speakers. I also produced the workshop report (ARMA22) for the session on full economic costing (fEC), this was an extremely will attended session as fEC was to be introduced across the UK the following year.

For the 2008 conference, ARMA also hosted the second biennial International Network of Research Management Societies (INORMS) Congress. I organised and co-presented two workshops; one on mentoring with colleagues from the Universities of Manchester and South Australia (Kerridge, Hochman et al, 2008)/(ARMA29) and one on Research Council funding with colleagues from the University of Glasgow and the BBSRC (Kerridge, Nimmo et al, 2008)/(ARMA30). I also stepped in to chair the post-conference event on international research ethics.

3.12.7 ARMA Advocacy

In 2009-10, I developed the belated first 'Overview of ARMA' presentation (Kerridge, 2010h)/(Prof10) to help define what the association and profession does, and made this available on the ARMA website; in 2011, I updated it (Prof14). I, and others, have used aspects of this presentation at various events for example at the Repositories Support Project summer school in 2009 (ERA14); the INORMS 2010 conference (Kerridge, 2010e)/(Prof02); and the BRAM-NET conference for research managers and administrators at Brunel in 2011 (Prof21).

During 2001 – 2005 executive committee members were tasked with producing reports from various parts of the annual conference for the benefit of those in other parallel sessions, or indeed not able to attend the event at all. My contributions can be found in the portfolio (ARMA19, ARMA20, ARMA21, ARMA22 and ARMA23) in relation to: Working with Funders; Presentation of Management Information; Postgraduate Research Degrees; Full Economic Costing; and Je-S for the Science Research Investment Fund, third call (SRIF3), respectively.

3.12.8 ARMA Communications

Over the years, over and above various texts for the ARMA website, I have contributed to many ARMA newsletters, for example (ARMA34, ARMA25, ERA35 and ERA36). From 2006 as secretary I have produced the minutes of the various committee/board meetings and of course those from the Annual General Meetings, for example (ARMA42 and ARMA43). I have also contributed to the annual reports over the same period, for example (ARMA01 and ARMA24). As well as championing the ERA special interest email group (ERA49), which has over 300 subscribers, I wrote the 'Heaven and Hell' article in Research Fortnight (Prof08) that provoked much debate (Prof07), see section 3.3.

3.12.9 ARMA Mentoring

As an association, ARMA introduced mentoring in 2005 and in 2006 I was fortunate to be paired with a senior member of staff from a Russell Group university research office to address her need in *"ERA systems, in particular*

electronic appraisals process" in order to *"Develop experience, best practice and skills, regarding e-research admin. Gain a greater understanding of the impact of this on research management as a whole."* (ERA45). As it turned out our relationship became mutually beneficial and we presented our experiences at the 2008 INORMS conference (ARMA29). In 2011 I undertook the mentoring of another person from a different research intensive university (Prof22).

3.12.10 ARMA Networking

Often because of my ARMA connections I have been invited to join various committees and steering groups (more ERA specific activities are listed below in section 3.12.13):

- 2006-2010, ROCG (Est01), the high profile Research Organisations Consultation Group is the formal mechanism by which the UK Research Councils interact with the Research Organisations (ROs) and comprises around ten RO representatives; the term of my membership ended in 2010.
- 2010-2011 HEFCE LGM PI Project (Est02), I was invited to join the steering group (Est03) for this funded initiative to develop a web resource for Principal Investigators (PIs) due to my experience in research management and administration; I developed the text for the research management areas (Prof11).
- 2011- UUK FP8 Sounding Board (Est18), I was invited to join this group of around ten RMAs to provide input to Universities UK for their position statement on the European Union's Eighth Framework Programme (now called Horizon2020) for Research and Technological Development.

As a senior manager at the University of Sunderland (and now at the University of Kent) I am also in a position to be able to provide input to and often lead responses to sector wide consultations, see for example (Prof17), enabling me to give an RMA as well as institutional perspective. Where appropriate ARMA also makes responses to consultations and I contribute to these.

These various networking activities evidence my standing in and contribution to the profession of research management and administration; ERA specific activities are covered in section 3.12.13.

3.12.11 ARMA North-East

At a regional level, building on relationships that I fostered when I instantiated an ad hoc group for European funding officers, I was instrumental in setting up the informal NE-ARMA group for heads of the research offices at the five campus based universities in north-east England. One of the major achievements of this group was the setting up and running of a very well received (Prof19) series of 'introduction to research administration' (Prof18) events in 2010.

3.12.12 ARMA Professional Development Framework

I also play an active role in progressing the ARMA professional development framework (Garnett and Golightly, 2011) and have spoken about it nationally (Prof20, Prof21) and internationally (Prof02). The latter leading to the development (Prof12, Prof13) of an informal international group of those interested in sharing good practice in professional development in research management and administration.

3.12.13 ARMA ERA

I have been an avid advocate of the use of IT systems in research management and administration. Specifically in relation to ARMA, I helped to develop some of the web pages for the previous version of the website and co-managed the implementation of the new (from 2008) ARMA website. I have also shared my experience with other members through numerous expert seminars, workshops, posters and the ERA special interest group that I champion. I have also represented ARMA on a number of ERA related national groups such as the JISC RIM Stakeholder Group, Je-S Management Board, JGP Steering Group and UKRDS Steering Group. These are expanded upon below and reflected on in section 4.8 in the context of my ERA developments at Sunderland.

- 2004-2011: RCUK Je-S Steering Group (Est20)/Management Board from 2006 (Est21). I was nominated to represent the research management and administration sector on the Research Council project to develop their electronic proposal submission system (Je-S). My contributions over the seven years were much appreciated (Est22).
- 2007-2010: RCUK Joint Grants Processing (JGP) Steering Group. Dr Ian Carter and I were approached (ERA68) by RCUK to represent the research organisation community on the JGP steering group in 2007, we agreed to attend alternate meetings and liaised to ensure continuity of message.
- In 2007 and 2008 I was asked by the Research Councils to present at their Je-S regional road-show seminars in order to give an expert user perspective of the system. There were eight events in 2007 (ERA66) to promote the new Je-S Studentship Data Capture functionality, I presented in London and Glasgow. In 2008 (ERA48) there were five events focussing on recent developments and the then forthcoming Shared Services Centre (SSC) and I presented at the first event in London.
- Also in 2008 I attended at Je-S Pool Administration (ERA77) event in Leeds and on the day I was asked to provide a short presentation of the functionality from a research organisation perspective (as I had previously seen the proposals and prototype screen shots during a meeting at the Research Councils).
- 2008-Present: UKRDS Steering Group (Est05), ARMA was asked to nominate a representative to sit on the group to guide the project aiming to set up a national repository for research datasets.
- 2009-Present: JISC RIM stakeholder group (Prof01), I am the ARMA representative on this cross sector group working to promote Research Information Management (RIM) good practice and standards. The main achievement to date has been the agreement (Bolton, 2010) for the UK sector to adopt CERIF (CERIF, 1991) as the standard for RIM data exchange. It also instantiated the Researcher Identifier Task and Finish Group, see below.

- 2009-Present: HEFCE RMAS Project Steering Group (Est12), I was invited to join this group on the strength of my ERA experience and my connections with Je-S. In 2011 the project was awarded £1.1M of funding from HEFCE (ERA67) to develop an integrated research management and administration system for the HE sector in the UK.
- In 2009 I co-organised, and presented (ERA09), an expert seminar (ERA07) on using ERA systems to prepare for the Research Excellence Framework (REF). Due to the expected (and actual) popularity of this seminar we ran it twice, once in Newcastle (which I organised) and a follow up one in London. I wrote up the results of the workshop (ERA60) and fed that back to the REF team at HEFCE.
- In 2010, following on from my 2009 conference session on ERA (ERA18), I was invited (ERA30) by ResearchResearch Ltd to give a presentation (ERA59) on ARMA and my preliminary findings from the ARMA survey (see section 6.2) that I undertook into perceptions to ERA systems. Correspondence (Est13) after the session led to me being invited to write half of a counterpoint piece about research management and administration (Prof08) which promoted much discussion in the sector (Prof07).
- Also in 2010 I was invited by Oracle UK (ERA75) to discuss requirements for a research costing system that they were intending to develop.
- Again in 2010 I was invited to join the national UUK Open Access Group (Est14) looking at the implications of Open Access publishing but was unable to attend, the ARMA Chair took up the option to join in my stead.
- In 2010 I was a reviewer for the first call of the JISC Research Information Management Programme (Est11)
- Next year in 2011 I was a reviewer for the JISC eContent Programme (Est21)
- In 2011 I was invited to join the JISC RIM Researcher Identifiers Task and Finish Group (Est23) set up to assess the business case for the construction/adoption/promotion of unique disambiguated identifiers for people, organisations and departments in the UK.

I have also presented my work on Electronic Research Administration at various ARMA events and publications (see section 4.8). Another main area of interaction with ARMA members has been my doctoral work on the perceptions of staff to the effects of ERA on the quality and quantity of research, see chapter 6.

3.13 Reflections

My involvement with ARMA and other bodies over this time has allowed me to make many contributions to the profession as outlined above. Further, these experiences have helped to shape me as a professional and give me a profile in the research management and administration profession in UK and abroad. I have a network of peers in other organisations that I am able to call on for help and advice, and this is of course a reciprocal arrangement. I have detailed above how I have helped to shape the profession that is research management and administration in the UK (with my particular contributions in Electronic Research Administration being covered in section 4.8).

Over the years I have developed from being a keen 'techie' into a rounded professional always looking at the bigger picture and how proposed developments may impact on others outside my immediate purview. For example my time on the various Research Council (Est20, Est21, ERA68, ERA66, ERA48 & ERA77) and JISC (Prof01, Est11, Est21 & Est23) groups have required me to take the national rather than institutional view.

During my 15 years (so far) with ARMA, I have spent 12 years on the committee helping to define and shape the profession and have contributed to numerous workshops and conferences: US Funding (ARMA35); Supporting Research Proposals (ARMA38, ARMA39 & ARMA40); Full Economic Costing (ARMA28 & ARMA33); Mentoring (ARMA29); Research Council Funding (ARMA30); and Post Award Finance (ARMA44, ARMA45 & ARMA05). Later events have always been the result of reflecting on the formal (and informal) feedback and improving content, style and structure of events. The culmination of all this work is a

professional association with over 1,700 members; a framework for professional development; and recognition of the association across the research sector.

It would be fallacious to claim that being one of now nine directors of an association with a membership approaching 1,800 makes me one of the top 0.5% of research managers and administrators in the UK; but it does evidence my proactive ambitions to help the development of research management and administration as a profession. I have argued that RMA has indeed developed from a community of practice into a profession and that I have played a key role in that development, however this is just a backdrop to the main thrust of my doctoral work in Electronic Research Administration which is discussed in the following chapter.

4 ELECTRONIC RESEARCH ADMINISTRATION

In this chapter I will define Electronic Research Administration and discuss my own work in this area in the national and international context. Following this is a discussion about whether IT systems can have an effect on products and processes that they manage and administrator, providing a theoretical underpinning to the hypothesis that ERA can affect the quality and quantity of research undertaken.

4.1 What is Electronic Research Administration (ERA)?

In section 3.1 I defined Research Management and Administration as ***'the leadership, management or support of research activities'*** and this is used as the basis for the definition of Electronic Research Administration (ERA). Firstly, it should be made clear that by Electronic Research Administration I actually mean Electronic Research Management and Administration, and whilst the acronym ERMA might seem more appropriate, the term ERA is already commonly used to mean the same thing and we need not introduce a new term just for the sake of it. In the seminal Kulakowski book Rodman and Stanford (2006, p.297) define ERA loosely as *"...improving administrative processes through the application of technology, particularly computer technology."* However, the simple use of email in research administration meets this definition whereas to me, ERA means something more. I define ERA as ***the use of IT system(s) designed specifically to support research management or administration***, rather than the use of generic IT tools (such as email or spreadsheets) which might be expected to be used in any management or administration environment.

There are two other related terms that are also frequently used: Research Management and Administration System (RMAS) and Current Research Information System (CRIS). The former, whilst also the name of a UK initiative of the same name (RMAS, 2011) has come to mean an ERA system in general. The latter has grown out of a European initiative, see euroCRIS (2010), to

develop a standard (CERIF, 1991), that has been updated over the years, for exchanging research information; a CRIS tends to refer to a system that is oriented towards information about staff and their publications rather than a full RMAS. It should be noted that both RMAS and CRIS refer to systems, whereas I have defined ERA as the use of an RMAS (or CRIS); or indeed an ERA system.

4.2 ERA in the UK

Some of the earliest examples of ERA systems in the UK were little more than websites: for example REFUND[3] in the early 1990s (Newcastle University, 2001), bespoke databases and stand alone costing and pricing systems (such as RACE-2[4] in the late 1990s and SiriusWeb[5] (Busby, 2003) which became available in 2002. Some of the early work that I led at Sunderland (see section 4.5) for example the GrAppl costing and pricing system that was available in 1997 (see chapter 7) was leading edge and according to the ERA timeline of Rodman and Stanford (2006) would be categorised as pioneering and innovative.

The first electronic research funding proposal submission system in the UK was developed for the Economic and Social Research Council (ESRC) and went live in 1999 (Clare, 2000) and ran successfully for a number of years until it was superseded by the Research Council's Joint Electronic Submission (Je-S)[6] system in 2005. After the introduction of the ESRC system other Research Councils developed other systems: the Medical Research Council (MRC) had their Electronic Application and Assessment (EAA) system and the Biotechnology and Biological Sciences Research Council (BBSRC), Engineering and Physical Sciences Research Council (EPSRC), Natural Environment Research Council (NERC) and Particle Physics and Astronomy Research Council (PPARC) (now the Science and Technology Facilities Council or STFC) jointly developed an Electronic Document Submission (EDS) system

[3] www.refund.ac.uk, now defunct; merged with COS in 2001, which itself merged with REFWorks in 2008
[4] From STCS Ltd (www.stcs.co.uk), RACE was developed to version 3 but is no longer available
[5] www.siriusweb.leeds.ac.uk; still available (17th April 2011)
[6] je-s.rcuk.ac.uk (18th April 2011)

which eventually became the basis for Je-S. Je-S went live in 2005, although it was not until 2011 that all of the seven UK Research Councils used Je-S; over that time I have been instrumental in providing a user perspective to developments through my work with RCUK, see (ERA66, Est04, Est10, Est20, Est21 and Est22) for example by eliciting and providing feedback on proposed initiatives from the wider community. Other funders have also introduced systems, for example the Royal Society (e-GAP), Cancer Research UK (eGMS), the Wellcome Trust (eGrants), the Leverhulme Trust (Grant Application System) and the European Commission (EPSS), see (Edinburgh Napier University, 2011)

In a different vein the UK Funding Councils introduced an electronic submission system[7] for the 2001 Research Assessment Exercise (RAE) and then a web-based system[8] for the 2008 exercise; I contributed to the development of this (ERA65). The 2008 system is being updated for the 2014 Research Excellence Framework (REF) and I have also provided input into the early user requirements for new system (ERA74).

Over the last ten years or so it has become an expectation rather than a novelty that funders will have an electronic submission system. At the same time there has been much progress in funding opportunity information systems, for example those provided by funders themselves (mainly through their websites), and also from data aggregators such as InfoEd (InfoEd, 2011), ProQuest (REFWorks-COS, 2011), Research Professional (ResearchProfessional, 2011) in the UK and the UKRO IMS system (ERA50) for European opportunities.

More recently there have been more commercial systems vendors entering into the arena with products covering varying subsets of ERA; Green, McArdle et al. (2010) provide a matrix of the offerings of 19 vendors against 14 sub areas of ERA. (Jacobs, 2011) provides a periodically updated holistic view of the status of ERA in the UK, which has been built upon to provide a UK resource (JISC

[7] RAE 2001 Data Application (RDA), see www.somis.dundee.ac.uk/rae/rae2001/rda/userguide/ (accessed 30th April 2011)
[8] RAE 2008 Data Collection System (DCS), see www.gla.ac.uk/media/media_95958_en.pdf (accessed 30th April 2011)

infoNet, 2011) on research information management; one of the five case studies is about the developments that I instigated at Sunderland.

There have also been many developments in open access publishing (Suber, 2010), publication information databases (Ball and Tunger, 2006) and institutional repositories, see *Open*DOAR[9] (Oliver, 2006). The evolution of the Sunderland system is described in chapter 8.

I have always had an interest in being able to develop a linked web of information about research and have advocated being able to link research outputs (publications) with the inputs (projects) and in recent years there has been some progress with bringing together the institutional repository and research administration worlds. I have been part of this process as a member of the JISC supported Research Information Management (RIM) Stakeholder Group (Prof01) and by giving presentations across the boundaries of these two groupings, for example RSP (ERA14), WRN (ERA29), Glasgow (ERA70), euroCRIS (ERA64) and RSP (ERA69). I contributed to the OCRIS project (ERA73) and I led the JISC funded IRIOS (ERA51) and follow-up IRIOS-2 (IRIOS-2, 2012) projects to link research council funded projects with institutional repository data. This is almost the converse of the research council initiatives to gather publication information from HEIs, as outlined by Green and Kerridge (2009)/(ERA25). I also lead the related CERIF for Datasets (C4D, 2012) JISC funded project that is using CERIF (see section 4.3) to describe research datasets and link them to publications and projects.

However the holy grail of an ERA system that will support all aspects of research management and administration is still a long way off. Whilst some universities have systems that cover most areas they are by no means transferrable. There are some companies that provide software solutions, but these only fulfil the requirements partially and tend not to be interoperable with software that covers complementary areas.

As part of the UK HEI survey that I conducted in 2010-11 (see section 6.3), I defined 15 sub-areas of ERA, see Table 1 below.

[9] http://www.opendoar.org/, accessed 2nd Jan 2012

Table 1: The 15 sub-areas of Electronic Research Administration

Area of Research Management and Administration	Short Code
Academic Expertise (eg mini CVs in an annual report)	AE
Funding source identification (eg "have you seen this call for proposals?")	Opp
Costing of proposals (eg using a calculator / spreadsheet)	CP
Support for generic parts of proposals (eg Univ. info, or project management)	Gen
Internal Peer Review	Peer
Ethical Review	Eth
Risk Assessment (eg lone-worker issues, intellectual property rights)	Risk
Proposal submission support (getting the proposal to the funder)	Sub
Contract negotiation (changes to price, terms, timescales etc)	Neg
Project management of the research	Mgt
Financial management of the research	Fin
Output and Impact recording (eg Annual Report)	Out
Research planning / strategy (eg prioritise Research Council funding)	Plan
Key Performance Indicators (eg proposal success rates)	KPI
Benchmarking (eg comparing income with like departments)	Ben

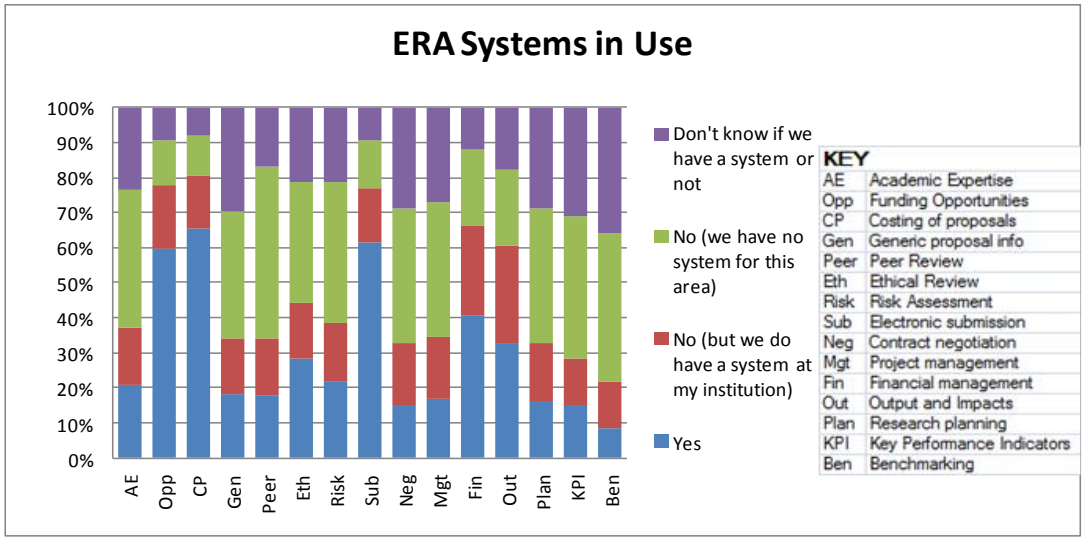

Figure 3: Sub-areas of RMA supported by ERA systems in use across the UK

Figure 3 above shows the responses from a UK wide questionnaire (see Kerridge (2011a)/(ERAQ06) and (ERAQ07) and section 6.3) that I undertook in 2010/11 with [n=159] respondents from over 20 HEIs. It clearly shows that Funding Opportunities, Costing and Pricing, and Proposal Submission support have the highest market penetration with Financial Management and Research

Outputs management not far behind; the other ten sub-areas are not commonly found. These findings are much the same as those reported by Binge (2009). It should be noted that no institution was reliably reported as having ERA support for all fifteen sub-areas.

HEFCE and JISC are (in 2011/12) supporting the next phase of the RMAS (RMAS, 2011) project which has worked with suppliers to develop a framework for a collection of interoperable modules that meet the requirements of a full ERA system, and be transferable to other institutions, (Foster and Batkin, 2012).

Over the last few years there has also been much work to address the issue of interoperability by developing and promoting data standards.

4.3 ERA Standards

In the 1980s the European Commission put together a group of experts (Asserson, Jeffery et al, 2002) to define the Common European Research Information Format (CERIF, 1991), which was recommended to member states. As outlined by euroCRIS (2010), over the years the stewardship of the developing standard (2000, 2004, 2006) was transferred to the euroCRIS organisation, culminating in the 2008 standard, see (Jörg, 2010), which in 2011 was updated to version 1.2 (Jörg, 2011) and is now at version 1.4 (euroCRIS, 2012).

A recent JISC commissioned study (Bolton, 2010), (ERA34) that I contributed to, has recommended that CERIF2008 be used in the UK for the exchange of research information data. This has been supported by a number of key stakeholders including ARMA, HEFCE, the UK Higher Education Statistics Agency (HESA), JISC, RCUK, UK Online (UKOLN) and the Wellcome Trust as well as a number of individual Universities (ERA58). This report resulted in a second round of funding producing four more JISC Research Information Management (RIM) projects all aiming to promote and demonstrate the use of CERIF in the UK. I lead one of these projects, IRIOS (ERA43, ERA51) which aimed to combine research council funded project data with publication

information held in local institutional repositories, using CERIF; a follow-on project (IRIOS-2, 2012) is now underway. I also lead the Sunderland RMAS pathfinder project for the national RMAS project (ERA67), (ERA71) that is using CERIF to develop a framework for cradle to grave ERA system for use in the UK.

Another area that is critical to data interoperability is that of authority lists. In order to be able to share data effectively it is crucial that the same entity from different datasets can be identified. For example, if university X has a project funded by the Wellcome Trust and university Y has a different project funded by the Wellcome Trust UK, are both projects funded by the same funder or not? Unique and authoritative identifiers are needed for institutions and staff (people), funders (and projects), publications (and other research outputs) and so on. There are a number of existing lists, including some by national bodies such as HESA; but there are none which are universally adopted. This could be a major stumbling block to the potential benefits of the use of a common data standard in the UK.

There are however initiatives underway, such as the JISC funded (NAMES, 2010) project which is hoping to create a name authority service (for researchers working in the UK), by Oct 2010 the database held information on over 200,000 authors from 680 institutions. This data has been gathered from British Library data sources and in 2011 was updated to include authors submitted to the 2008 Research Assessment Exercise. There are however many other holders of lists of staff in the UK, for example companies such as Elsevier and Thomson Reuters. It is possible that NAMES will become the authority list and provide translations to these other identifiers and more, however there are many competing initiatives (Warner, 2010; Jones, 2011) such as ORCID[10] (Fenner, 2011).

Much work is needed in this area to provide the requisite and widely adopted authority lists for the UK and the wider world. In 2011 JISC instigated a Researcher Identifier Task and Finish Group to advise on how to develop authority lists for researchers, I was invited to join this group (Est23). ORCID

[10] http://orcid.org/, accessed 2nd Jan 2012

now seems most promising approach and has been proposed by the group as the preferred solution for the UK. Looking further afield to the rest of the world the problem becomes even more fragmented and complex, so I will focus discussion on ERA rather than standards and authority lists.

4.4 ERA around the world

As described by Rodman and Stanford (2006) ERA developments in the United States can be charted back a number of years to the 1990s with initiatives from the National Science Foundation (NSF), the National Institutes for Health (NIH) and the Office of Naval Research (ONR). This was supplemented by a number of federal agencies instituting the Electronic Commerce Committee (ECC), which amongst other things in the mid 1990s published an ANSI data standard for grant information. This was then followed by the Federal Commons, a government system allowing universities (and others) to manage grant applications for a number of federal agencies, which is widely adopted in the United States having over 200,000 users (Rockey, 2009).

There are a number of systems available in North America (including most of those listed in section 4.2). One notable addition is the open source Kuali Foundation's Coeus[11] system based on software developed at the Massachusetts Institute of Technology; it is however US centric and has so far not gained any traction outside the United States of America; like many of its commercial counterparts.

Within parts of Europe there is strong support for the CERIF standard for the exchange of research information and many systems have been built to support this standard. There is however no single off the shelf system that will support all of the activities of research management and administration in the UK (Binge, 2009) and so the potential of CERIF has yet to be realised, although the RMAS (RMAS, 2011) project aims to address that. CERIF, however, is a European standard, and I have contributed to the European agenda through euroCRIS, for example speaking at a workshop in Rome (ERA64) on CERIF

[11] See http://kuali.org/kc, accessed 1st May 2011

adoption in the UK and the perspective of RMAs to CERIF. I will also speak on the subject at the INORMS and EARMA conferences in 2012 and have papers accepted for CRIS2012.

There are a number of European suppliers of CERIF compliant systems that cover subsets of a complete cradle to grave ERA system, including Elements[12] from Symplectic in the UK. Two other companies have recently made inroads into the UK marketplace: Atira with their PURE[13] systems and Avedas with their CONVERIS[14] system. However the situation in the UK in the early part of 2012 can best be described as piecemeal, with many HEIs using various sub-systems that do not work well together.

It can be concluded that whilst a fully scoped and integrated Electronic Research Administration system would be a panacea; such a system, which could be implemented in more than one HEI does not exist in the UK. The Research Management and Administration System (RMAS) initiative (ERA67) is however a step in this direction, with the procurement framework now available.

4.5 ERA systems at Sunderland

In 1995 when I began developing systems at Sunderland, it was from necessity. There was no off the shelf system that could be bought to support most aspects of research management and administration, with the notable exception of funding opportunities (REFUND) and costing and pricing (RACE-2). We subscribed to REFUND but found that RACE-2 did not meet our costing and pricing needs and was not easily able to be integrated with other university systems.

Over the 1995-2010 I developed (and latterly managed the development of) a suite of integrated ERA systems at the University of Sunderland, known collectively as GRS[15] On-line, proving access to the GRS database (GRSdB)

[12] See http://www.symplectic.co.uk/, accessed 24th April 2011
[13] See http://www.atira.dk/en/pure/, accessed 1st May 2011
[14] See http://www.avedas.com/en/converis.html, accessed 1st May 2011
[15] For most of the period in question the systems were developed and managed by me when working in the Graduate Research School (GRS) service; the moniker for the systems was adopted and retained in popular usage in the University.

holding all the data. The database includes: information about academic staff, their proposals, projects and outputs and the linkages between them. Functionality the system provides multi-layer access control to view, add, edit and delete information together with business process workflow to manage, for example, costing and pricing approval for proposals. It also provides automated reminders and reports. I have provided a detailed overview of these systems in (ERA05) and this was also précised in a poster (Kerridge, 2010b)/(ERA22) presentation at the INORMS2010 conference in Cape Town. An overview (Kerridge, 2010c)/(ERA31) was also published in the Research Global magazine. The underlying database structure is given in (ERA04) and the data is described in (ERA03). The web interface, which allows data to be viewed and modified subject to access control is available on the University of Sunderland GRS On-line[16]; there are various other websites that use parts of the data to deliver web pages, for example the 2008 RAE mini website[17] and the new site[18] under development to replace it.

Over the years I developed the parts of the system in response to specific requirements. Initially the system was used to record proposals for external research funding. It was extended to include information on the research interests of staff in order to better manually direct funding opportunities. A publication information area was added to support submissions to the 2001 Research Assessment Exercise. With the merging of the post-graduate research (PGR) student section into the research office, information about PGRs and their progress was added. By 1997 a costing and pricing approval system has been added and the following year (with the addition of the post-award finance team to the research office) a project administration workflow system was developed. Some automated KPIs were also generated at the behest of the deputy vice-chancellor. In 2005 when Full Economic Costing (fEC) was introduced in the UK (Alexander, 2009) the costing and pricing system had to be updated to take into account the new methodology, it was also extended to cover non-research projects. The approach taken at

[16] http://www.grs.sunderland.ac.uk/grssite/grshome.cfm, accessed 30th April 2011
[17] http://www.sunderland.ac.uk/research/rae/, accessed 30th April 2011
[18] http://www.sunderland.ac.uk/research/new-dir/, accessed 30th April 2011

Sunderland is of course not the only one possible, a different long term ERA system implementation approach is described by Alcaine, Ballance et al. (2011), working with a commercial vendor but still encountering similar issues. For a fuller description of the rationale for the various tranches of developments at Sunderland see (ERA05), (Kerridge, 2010c), (Kerridge, 2010b).

The database is (24th Aug 2010 snapshot) over 0.5GB in size comprising 400 tables and 468 primary queries with over 40,000 substantive data records; and linked to it are 38,300 associated document files.

At that time the system had had 1,128 registered users, and information about 2,387 members of staff and people affiliated with the University. It also contains information on 1,954 post-graduate research students and their 1,740 supervisors and examiners together with 15,745 notes on progress and issues. The project proposal area had 971 pre-fEC proposals and 2,025 post fEC (see chapter 7 for further details on the costing and pricing area) proposals to 1,097 funders; with information about 1,148 funded projects; with 12,032 notes and action reminders. There were 8,797 research outputs (publications) published by 2,207 publishers from 5,377 authors; of these 2,834 journal articles appeared in 1,506 journals (see chapter 8 for further details on the publications area). There was also information on 777 research seminars recorded in the database. Since a previous archive purge (on 2nd Nov 2000) there were 999,232 recorded transactions. See portfolio item (ERA42) for further details.

All this data, whilst perhaps interesting, is not properly harnessed until it is put to use. Over the years the data from the various GRS systems has been used for multifarious purposes. On a day to day basis they are used to support the activities of the research office. Periodically they are used to generate key performance indicators for the University's Research Committee and for annual returns to HEFCE and HESA, and of course the multi-annual national research assessment exercises (the 1996, 2001 and 2008 RAEs). The data has also been used to support applications for internal promotions. Perhaps most importantly the data have been used strategically by the University, for example in supporting the recent process to determine cross University beacon research areas.

It can be seen from the above that the database itself is quite extensive and has been well used, however the interface itself was originally developed in 1996 and hardly updated since. Figure 4 shows a sample screen shot from the system listing publication details for an author, the main navigation buttons can be seen at the top of the screen with some shortcut buttons on the left hand side to quickly access often used areas of the system.

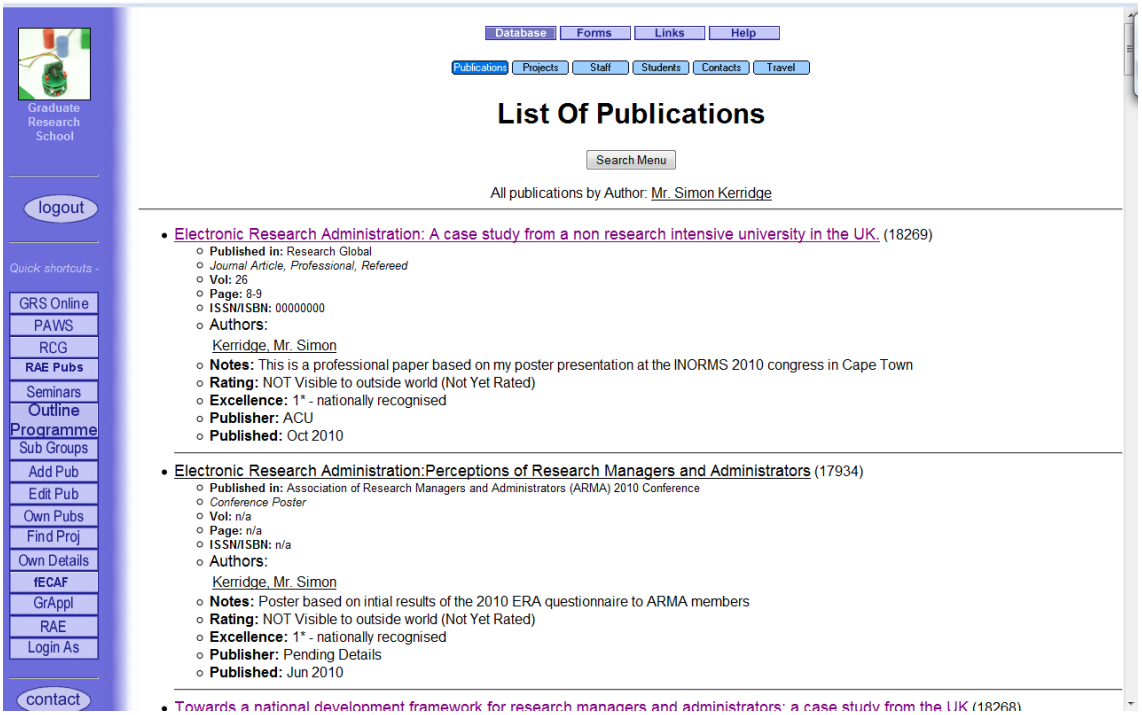

Figure 4: Screen shot from GRS On-line - the web interface to the GRSdB

4.6 Reflections on the Sunderland ERA systems

Looking back on the developments over the past 16 years it is now obvious that whilst each individual element was at the time planned, the overall system was not; it has been extended and modified to meet specific needs, see Kerridge (2010c)/(ERA31). Some areas have become redundant and others are becoming difficult to maintain. It is clear that not enough resource was put into the maintenance and data cleansing of the system. This is not an uncommon situation in the business world (Truex, Baskerville et al, 1999) and the system as it is now in 2012 is a good advert for what can happen if systems are not properly maintained (FG03).

In hindsight it may have been better to concentrate on ensuring that the system was being used as expected rather than by adding new features. However when new features are 'requested' from further up the university hierarchy it is difficult to prioritise maintenance and review. For example the fECAF system (see section 7.3) was due to have a formal review one year after implementation, in 2006, but a review was not undertaken until 2010; and only then as part of this doctoral work, see (FG02, FG03).

During the 16 years since the GRS On-line system was first developed there have been a number of commercial systems that have become available. At an ARMA event that I helped run (ARMA28, ARMA37, ARMA33) in 2007 one of the focus groups was looking at tools to support fEC and of the around 15 people in the group that I was facilitating all but one used pFACT[19] or were in the process of buying / implementing it. I mentioned this to my line manager who in turn mentioned it to the Director of Planning and Finance who decided to just buy it. It was purchased in early 2008 and hence the imperative for developments to fECAF were removed. However, pFACT was not actually rolled out the middle of 2010, almost two years behind schedule. This left the fECAF system without any real maintenance or development over that period as it was deemed to be wasted effort, with the new pFACT system due imminently. Again, looking back, it would have been much better for the system users if the old system were properly maintained until the new system was fully rolled out rather than saving some resource for the intervening period. If it had been only a couple of months then this would probably have been acceptable, but a couple of years produced an untenable situation, see (FG03). This area is covered in more detail in chapter 7. A similar, but less extreme, position developed with the publications area of the database, see chapter 8.

In effect the systems development had been carefully planned in the first few years and then became a series of ad hoc developments as new functionality was required. In 2009 I developed a five year plan (see ERA62) to replace/update/renew all of the existing systems by 2014. So now (from 2009) the research support systems are, for the first time, seen as being business

[19] pFACT is a brand of Costing and Pricing software (see section 7.4) and also http://services.sunderland.ac.uk/finance/pfact/about-pfact/, accessed 3rd Sept 2011

systems of the University and there is a plan to migrate the infrastructure that supports them into the central IT service. This should mean that, by 2014, all research support (ERA) systems will have been updated/replaced/renewed and taken under the umbrella of the central IT service. They will be fully involved in that process which should help them to 'buy-in' to the new systems. As a result of me being invited (Est12) onto the RMAS steering group an opportunity became available for Sunderland to become a pathfinder institution (ERA71) for the proposed new system. The RMAS system will be an integrated research support system much as described in my five year plan. The funding from the RMAS project (ERA67) will enable Sunderland to accelerate the five year plan by a year or so. This will involve a lot of work and although the efficiency saving of using an ERA should be recouped in a few years (Welland, 2009), is it possible that there are additional benefits, might the research itself actually be enhanced?

4.7 Can ERA make a difference?

During my work on Electronic Research Administration and Research Management and Administration in general I found that there was little research into whether they actually make a difference to research or not. Indeed only one article (Feller, 2000) alludes to the potential effect of benchmarking with ERA systems in terms of improving internal efficiencies, but provides no evidence. However, when looking more widely at the potential effects of IT systems on the processes that they manage, there is some literature to support the hypothesis that ERA can affect the quality and quantity of research.

In the early days of computing the impact of software was generally studied in terms of the efficiencies of the development and implementation of the software itself, see for example Boehm (1973) and Keen (1981). Later the influential work of DeLone and McLean (1992) described a framework for assessing the impact of Information Systems (the D&M IS Success Model) on individuals and organisations based on systems quality and information quality in conjunction with systems use and user satisfaction to produce individual impact(s) leading to organisational impacts. A review ten years later by the original authors

(DeLone & McLean, 2003) revealed that this model had been widely cited and used and they also proposed some refinements: the addition of a third quality dimension (service quality); and the contraction of individual and organisational impacts into a continuum of net benefits. As Perez-Mira (2010, p.45) points out there are far fewer empirical studies looking at the organisational (or larger) end of the net benefits spectrum of the D&M model and hence "there cannot be a consensus in terms of measures, relationships, or overall fit of the model at the organizational level of analysis". This is reflected (see Figure 5 below) in the work of Petter et al (2008) in their review of 90 empirical studies where only the System Quality to Net Benefits connection is shown to have moderately or strong evidential support; however they note that Use may also be linked to Net Benefits. At the level of benefits for an individual there are many more links that have strong evidential support from case studies and as Net Benefits are now seen as a spectrum from individual to organisation and beyond it is not unreasonable to assume that the model is still applicable at the organisational level.

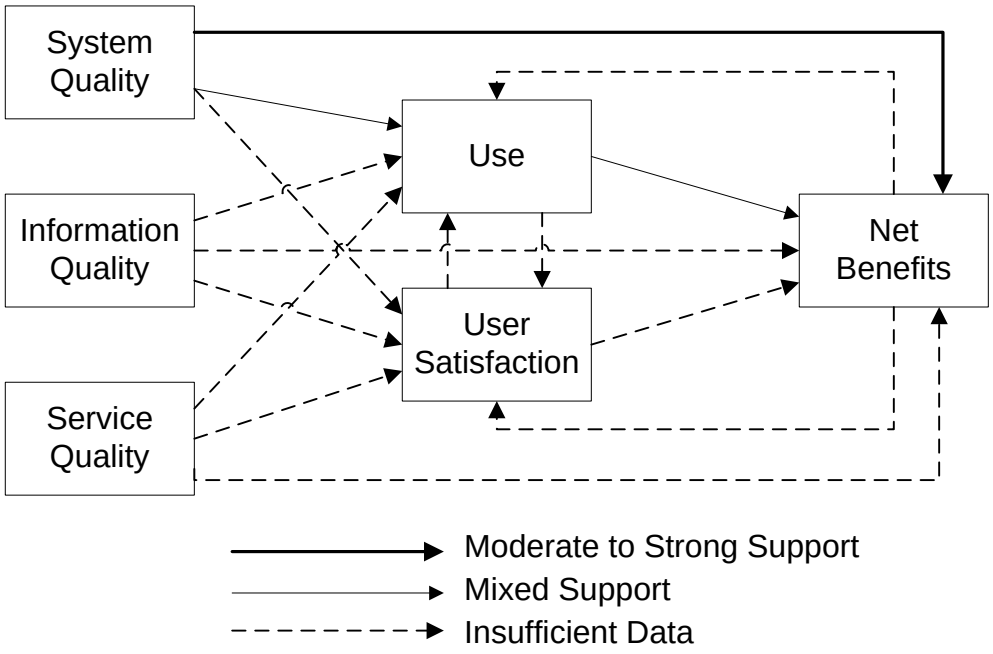

Figure 5: Support for interrelationships between D&M success constructs at an organizational level of analysis, from Petter et al (2008, p.255 [Figure 4])

There are a number of taxonomies for impact at the organisational level, such as the nine levers identified by Davenport and Short (1990), however these often only consider the direct impacts. Others such as Seddon, Staples et al

(1999) define IS effectiveness in terms of 30 'stakeholder' – 'information system type' combinations. Sedera and Gable (2004) take a more holistic approach and identify eight dimensions of impact (including direct and indirect effects) that are applicable to the public sector. It should be noted that whilst the e-Government dimension was not covered in their university study, in terms of ERA system impact this could be envisioned as direct submission to government sponsors (for example Research Council's Je-S system or the Funding Council's RAE/REF Data Collection System).

Taking each of the Sedera and Gable (2004) organisational impact dimensions in turn we can describe them in terms of aspects of ERA systems, by identifying examples, thus providing a theoretical underpinning for the hypothesis that the use of ERA systems can affect the quality and quantity of research undertaken.

Table 2: Dimensions of Sedera and Gable's Organisational Impact in terms of ERA Systems

Sedera & Gable Organisational Impact Dimension	Mapping to Electronic Research Administration (ERA) Systems in terms of effect on quality and quantity of research
OI1 Organizational costs	The potential cost reductions are discussed below (see OI3). In terms of the cost of the research itself, a more efficient university administration would mean a lower 'indirect cost rate' meaning that some funders would actually pay less for the same piece of work, reducing the research income (the main measure of quantity). It might however be assumed that the impact from the other dimensions would outweigh this effect.
OI2 Staff requirements	An efficient ERA system would provide academic and research staff with comprehensive and up to date information. In the case of funding opportunities it can be seen that an opportunity that might otherwise have been missed could be taken advantage of in order to lever external funding and hence increase research quantity.
OI3 Cost reduction	The RMAS study (Welland, 2009) estimates efficiency savings of 10-20% of staff time for an ERA system, with the example for Exeter equating to savings of £375K per annum. This saving could be reinvested in research (see OI6).
OI4 Overall productivity	Overall productivity implies all areas of activity being increased (which for a university includes research) this in turn means that more and/or better (depending on the type of productivity) research is being undertaken (quantity and/or quality).
OI5 Improved outcomes / outputs	In terms of research, improved outcomes and outputs imply that the research itself has improved (as outputs are an indicator of quality of research and indeed are part of the research process). Indirectly improved outputs lead to improved performance in research assessment and hence increased core funding for research, increasing the quantity of research that can be undertaken.

OI6 Increased capacity	Freeing up of academic and research staff time from management and administration duties would directly increase the capacity for the organisation to undertake research. Quantity would be increased and with more time available quality could also perhaps be increased
OI7 e-Government	Exchanging information directly with government organisations (such as the research councils) is enabled by ERA systems (such as Je-S), efficiencies in these processes provide cost reductions (OI3).
OI8 Business Process Change	ERA systems can enhance business processes and enable better processes to be developed. For example a proposal submission approval process can become much more efficient when done electronically, potentially speeding up the process and allowing people to see what the current position in the workflow is, contributing to overall productivity (OI4).

The table above indicates how the various organisational impacts identified by Sedera and Gable (2004) could be achieved by an ERA system, providing a mechanism for the hypothesis that ERA systems can affect the quality and quantity of research undertaken. However the aim of this report is not to determine which of these various impacts can be achieved in actuality (although this would certainly be an interesting topic to pursue in the future) but whether it is thought by RMAs and academic staff that these ERA mechanisms can (positively) affect the quality and quantity of research undertaken.

Whilst not explicitly using the D&M model, Banker, Bardhan et al. (2006) used a similar approach to look at the effect of collaborative product commerce (computer supported collaborative work within a supply chain) on design teams and found a positive impact on product design quality and a reduction in development times and hence costs. An ERA system analogy could be the development of a project proposal which, if the findings are transferrable, would be developed in less time and be of higher quality (thus increasing the chances of winning research funding).

Mirani and Lederer (1998) have also developed an instrument to measure organisational benefits comprising elements grouped into three main areas: strategic, informational, and transactional. Within these areas they identify 33 potential benefits of IS projects. Seven of these benefits can be couched in

terms of their potential impact on the quality and/or quantity of research undertaken.

Table 3: Mirani and Lederer benefits in terms of ERA Systems

Mirani and Lederer (1998) benefit	Comment in terms of possible ERA effect
7. (strategic) Change the way the organization conducts business	Although this normally refers to changes in business process rather than the way in which products (research) are developed
10. (strategic) Align well with stated organizational goals	Often HEIs have goals to undertake more, excellent research see for example UCL (2011), so an ERA system could help with this alignment, however there is no clear direct mechanism for this
11. (transactional) Facilitate organizational adherence to governmental regulations	Certainly an ERA system could do this, but there is no direct link to the quality and quantity of research
21. (informational) Enable easier access to information	This could increase the quantity and quality of proposals leading to increased research funding (quantity of research).
29. (transactional) Speed up transactions or shorten product cycles	In relation to applications for external funding; if these could be developed more quickly, then potentially more proposals could be made and hence (assuming the same quality) more proposals would be funded leading to increased research quantity.
31. (transactional) Enhance employee productivity or business efficiency	If we equate productivity to quantity then there is a possible direct link to research quantity, it could also be argued that productivity could be linked to the quality of employee work and hence to research quality
33. (strategic) Enable the organization to respond more quickly to change	This could be manifested as the ability to respond to new research opportunities and hence affect the quantity of research

In summary there is evidence in the literature to support for the assertion that IT systems can affect the processes that they are administering, and further that this affect can have an impact on the actual products or services that they support; and this is underpinned by theoretical work by a range of authors including DeLone and McLean (1992, 2003), Sedera and Gable (2004), Mirani and Lederer (1998), and Banker, Bardhan et al. (2006). An ERA system is

simply an IT system that is designed specifically to support research management and administration, and so it is reasonable to assume that an ERA system could affect research management and administration and therefore the research process itself; however, this has not been demonstrated. A logical next step would be to test this assertion and certainly this would be an interesting avenue for future work. However, due to the issues involved in terms of the availability of experimental data (see section 5.6) an alternative approach is taken: to determine whether or not those involved in the processes believe that it could be case, thus addressing the research question "is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research".

In order to try and answer this question of whether ERA systems actually have tangible benefits beyond efficiencies in the research office, I undertook some empirical research. I looked at two sub-areas of the ERA systems at Sunderland: costing & pricing and publications (see chapters 7 and 8 respectively) and also conducted a series of national surveys asking about perceptions of ERA systems (see chapter 6). This research was undertaken as a practitioner and so it is perhaps helpful to reflect on the contributions that I have made to ERA in order to contextualise the research described in chapters 6, 7 and 8.

4.8 Summary of My Contributions to ERA

As well as developing a suite of ERA systems at Sunderland collectively known as GRSdB (see section 4.5), I have analysed two of the sub-areas in detail as case studies; costing and pricing (see chapter 7) and publications information (see chapter 8). I have also undertaken research into the perceptions of RMAs and academic staff to ERA systems (see chapter 6) and their potential to affect the quality and quantity of research undertaken.

In parallel with my work at Sunderland I have also become involved in a number of national initiatives that have and will continue to help shape the landscape of ERA in the UK, and potentially abroad.

In 2002 I was one of the four strong user-group members (ERA50) that directed the implementation of the UKRO Integrated Management System (IMS). I have also provided user input to the 2008 RAE software (belowERA65) and the 2014 REF software (ERA74).

In 2004 I was appointed (Est20) to the Je-S 1 Steering Group as the only representative from a Research Organisation (RO) in order to provide a user perspective on the development of Je-S, the Research Councils electronic submission system. In 2006, after Je-S had become mainstream the steering group was no longer required and I was appointed (Est21) to the Je-S Management Board, again as the only RO representative. With the introduction of the Shared Services Centre (SSC), the Je-S Management Board was disbanded in 2011; with my contributions over the years being thoroughly appreciated (Est22).

In 2005 I organised a Je-S SRIF3 (Science Research Investment Fund) surgery workshop (ARMA23) which helped to define the final interface for the then forthcoming national SRIF call for submissions that allocated £903M to English HEIs. In 2007 and 2008 I presented at a number of Je-S roadshow events (ERA66, ERA48) across the country as an advocate for new features of the Je-S system.

In 2007 I (as Je-S Management Board member) and Dr Ian Carter (as chair of ROCG) were approached to join the Joint Grants Processing (JGP) Steering Group; we agreed to share the task and attended alternate meetings. In 2010 the JGP was disbanded due to RCUK re-organisations in light of their Shared Services Centre (SSC).

My close working relationship with the Research Council's Je-S team is perhaps exemplified by their asking me to be a referee (Est04) when they bid for funded development work. I am also a main point of contact for discussions between the Research Councils and HEIs on ERA related matters see for example (Est10).

Over that period I was instrumental in introducing a number of enhancements to the Je-S system, such as better pool administration[20] and reporting. However, perhaps the enhancement that I suggested that had the biggest impact was one of the simplest; a list of forthcoming submission deadlines is now available when logging in, allowing RMAs to easily prioritise their work.

I am recognised as an expert on ERA in the UK. For example, in 2009 I was invited (Est11) to be a reviewer for the first JISC Research Information Management (RIM) call for proposals. I was also invited to review the 2nd round in 2010, but had to decline as I had submitted a proposal for funding myself: IRIOS (ERA43), which was subsequently funded (ERA51) to the value of £64,365. It was one of only four JISC RIM2 projects; and developed a proof of concept CERIF compliant ERA system to link Research Council project data with HEI Institutional Repositories to create, potentially, a UK wide resource. A follow-up project (IRIOS-2, 2012) was subsequently funded to the value of £178,733. I also led the development of a related project (C4D, 2012) which received funding of £247,083. I also undertook peer reviewing for the JISC eContent (Est19) call for proposals in 2011. I have been invited (through ARMA) to sit on the UK Research Data Service (UKRDS) Steering Group (Est05); the RMAS Steering Group (Est12); the Universities UK (UUK) Open Access Group (Est14), which I was unable to attend but passed the opportunity on to an ARMA colleague; and the JISC Researcher Identifiers Task and Finish Group (Est23). Through my work on the RMAS Steering Group I have positioned Sunderland as one of the three national pathfinder institutions that have each been awarded £200,000 funding from HEFCE / JISC (ERA67), (ERA71) to develop a national ERA system.

I was invited (Est08) to comment on a draft report by JISC prior to publication. I was the ARMA representative mentioned in the JISC EXRI Briefing Paper (ERA58) that proposed that a business case for CERIF in the UK should be produced, and took part in the pivotal RIM Group meeting (Prof01) at which the

[20] When submitting proposals in Je-S there is a (one or two stage) approval process which is managed by the research office of the submitting organisation. At each stage, depending on the hierarchy of the organisation there may be a number of people who can approve a proposal. Initially the management of this process was time consuming and at times problematic.

decision was made. I was one of the twelve people across the UK who were interviewed as part of the development of the JISC Business Case for CERIF (ERA34). I was also acknowledged in the JISC RIM2 call for proposals supporting information document (ERA37) for my contribution.

I have been a mentor (ERA45) for a senior member of staff from a research intensive university wanting help on how to approach ERA developments. I have provided help and advice to a number of universities including Manchester Metropolitan (ERA63), Durham (ERA46) and Teesside (ERA47) on ERA; and also to ResearchResearch Ltd (ERA59) the publisher of the professional magazine "Research Fortnight".

In terms of wider audiences, I have organised and presented at a number of national events on ERA and related matters: "Websites for Research" (ERA40) in 2000 with Steff Hazlehurst; "RAE Software" (ERA65), in 2005 given by Jennifer Crook and Gareth Edwards; "IT, Data and Systems" (ERA38) in 2006 with Dr Ian Carter; "Research Management and the REF consultation" (ERA07) in 2009, looking at ERA systems to support REF data collection; "Institutional Repositories, just a bit of a CRIS?" (ERA29), in 2010 which was picked up in the ARIADNE journal (ERA28).

I have also presented a number of posters at conferences: "Can Research Management Systems Improve the Quality and Quantity of Research" (ERA23) at the 2009 ARMA conference, which in conjunction with the workshop (ERA18) at the same conference led onto the survey work described in chapter 6; "Electronic Research Administration" (ERA14) in 2009; "Electronic Research Administration: A case study from a non research intensive university in the UK" (ERA22) at INORMS 2010; "Electronic Research Administration: Perceptions of Research Managers and Administrators" (ERA21) at ARMA 2010.

And I have published on ERA issues: "RCUK Outputs and Outcomes Collection: OOCS project" (ERA25), 2009 with Alan Green, reprinted in the ARMA Newsletter (ERA20); "Electronic Research Administration: A case study from a non research intensive university in the UK" (ERA31), an updated version

of the poster (ERA22) given at the INORMS conference earlier in 2010. Whilst, to date, I have not published academically in the area of ERA, I have published in other subject areas in academic journals and conferences in the past (Hist03).

I have also provided numerous short updates on ERA systems and developments in the ARMA ERA special interest group mailing list (ERA50), and in ARMA e-newsletters, for example (ERA35) and (ERA36). I am often asked for my opinion on matters relating to ERA; a recent example is (ERA61).

In summary, I have developed extensive ERA systems over 16 years at Sunderland and contributed to many important ERA related national initiatives including Je-S, RAE/REF, RIM and RMAS; and have advised on ERA developments for UKRO, HEFCE and RCUK. I have spoken and written widely about ERA and am acknowledged as a national expert as evidenced by the various committees and reviews that I am invited to participate in, and the externally funded collaborative ERA projects that I lead and collaborate on.

5 RESEARCH DESIGN

Unlike traditional PhDs where research is conducted in depth on a focussed area of research, a professional doctorate can take a broader approach weaving a number of themes together into a coherent body of work (Lee, 2009). Also, a professional doctorate incorporates much work that has been undertaken prior to the period of doctoral study. Reflection is often used as a technique for couching this prior work in a research context (Moon, 2006; Bradbury, Frost et al., 2009).

Therefore this chapter will present discussions on the role of reflection in a professional doctorate, highlighting issues faced by practitioner researchers. Then the research question "***is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research***" is analysed to decide upon an appropriate research approach and methods to be used. Finally two strands of empirical work are identified that can provide data to address the research question: the case studies at Sunderland including focus group and survey work; and a series of national surveys into the perceptions of ERA systems.

5.1 Reflective Practice

This section discusses reflective practice as an underpinning tenet of the professional doctorate.

This report draws directly on the 13 years of work prior to the start of the doctoral studies in 2008 (from 1995 onwards) and more indirectly on the previous eight years of post graduate experience before that. Whilst some of this work (1990-1994) was conducted as a research assistant and a number of research outputs (Hist03) were produced, they were not directly applicable to this body of work and serve only to evidence the author's ability to undertaken research at the required level of rigour for doctoral work.

In order to contextualise the body of work from the research management and administration period (1995-2008) the work must be revisited and reflected upon.

Over the course of the professional doctorate studies (2008-2011) one key element of my personal development has been my improved understanding of, and more importantly, use of reflection. Schön (1991) is widely credited for introducing the concept of reflection to the mainstream in the 1980s, but even he talks about reflection-in-action as often not being generally accepted as part of professional practice. However, over the years, others such as Golding (2000) and Moon (2006) have developed the theory and provided frameworks within which reflection can be practised. This ranges from simple methods such as Golding's suggestion to keep a journal and record ideas in it, rather than putting them on the back of an envelope only to lose them later. Whereas Moon (2006, p.161) goes further and amongst other things defines four levels of reflective writing from simple 'descriptive writing' to 'descriptive account with some reflection' through 'Reflective writing (1)' where the focus is on reflection, culminating in 'Reflective writing (2)' where the entire purpose of the piece is reflection, perhaps abstractly.

There are many different methods of reflection, including experiential learning (Kolb, 1984), critical incident (Brookfield, 1995), action research (Carr and Kemmis, 1986), DATA (Peters, 1991) and concept maps (Novak and Cañas, 2008). However I found the approach that most helped me was the story telling method, or as Mattingly (1991) describes it, narrative inquiry. This was used for example to produce my draft paper on the development of Electronic Research Administration systems at Sunderland (ERA05), the associated conference poster (Kerridge, 2010b)/(ERA22) and the professional article derived from it (Kerridge, 2010c)/(ERA31).

Overall, reflective practice has not only been an underlying tenet bringing this body of work together, but has also become part of my professional life. In order to select items for the portfolio and describe their context, implicitly reflection is required; however at a more critical level (Moon's first level of 'Reflective writing') more value is added to the process. Constructing the

portfolio could have been just a process of selecting items to illustrate the way in which different events have shaped my career. However, by recalling events and reflecting on how I might have done things differently, the process has been empowering and cathartic. As an example, when I decided to take the opportunity to use a conference workshop (Kerridge, Golightly et al, 2009)/(ERA18) to test my hypothesis that "ERA can affect the quality and quantity of research" I quickly developed a short questionnaire (ERAQ08), see section 5.8.1, for use in the workshop. However I had not taken enough time to pilot the questionnaire and had couched the questions in a way that did not allow for a negative effect to be recorded. This was therefore addressed in the ARMA Questionnaire (ERAQ01), see section 5.8.2; although the wording (notwithstanding the piloting) still allowed for some confusion. It was not until the UK HEI Questionnaire (ERAQ02), see section 5.8.3, was developed that this issue was fully addressed. Whilst it is argued (ERAQ04) that this did not materially affect the responses (as the vast majority were positive), this flaw in the questionnaire design could potentially have rendered the data collection as useless. On reflection the tension between being a practitioner and researcher (see section 5.2) caused me to start data collection before I was fully ready (although at the time I thought that I was). Another occasion that gave me cause to reflect was the feedback (ARMA36) from a presentation that I gave (ARMA35) at the 2003 RAG*net* conference. My delivery style was not appreciated by most and I made strenuous efforts to improve the clarity of my delivery at subsequent events.

I have achieved a great many things and perhaps in the past not made the most of my successes. My main regret from the past is not making the time to record and disseminate the work that I had done. At the time this seemed a trivial issue, in retrospect it seems likely that others would have been interested in various aspects of my work; and indeed I would have greatly benefitted from this to aid my own reflection with more documentary evidence.

In summary, I cannot stress enough the importance of stopping to reflect rather than plunging immediately into the next project, see for example Taylor (2000).

However, this is often easier said than done in a busy work environment, often faced by the research practitioner.

5.2 Practitioner Research

Practitioner research can be defined as 'research carried out by practitioners for the purpose of advancing their own practice' (McLeod, 1999, p.8). The aim of this work is to determine perceptions to the utility of ERA systems in order that RMA professionals can better use such systems, and so it is clear that practitioner research is being undertaken here. This is not however without its disadvantages.

As with all things in life if you can devote yourself full time to a particular cause then that cause is likely to benefit from that concentrated effort. Whilst it is clear that even full time researchers are probably not able to devote all of their time to research they have, at least in theory, the luxury of specific parts of their employed time being allocated to undertaking research. Practitioners by their very nature are often full-time employees not employed to do research and I fall into this category. So even making the time for research between a very busy day job and an increasingly nonexistent home and social life is a challenge. This situation is however no different to that faced by a part time PhD student.

However, practitioners also have different challenges to contend with. As a professional doctorate is by its very nature a work based learning degree one main advantage is the access to data for the research. This can however also be a drawback as often it can be difficult to collect and analyse data impartially when the data are directly or indirectly related to the researcher themselves, Tenni et al (2003). Bensimon (2004, p.108) defines practitioner-as-researchers as individuals who "conduct research about their own institutions, and by doing so they acquire knowledge that they can use to bring about change in these institutions", which is certainly the case here. Before I started my doctoral studies I had unwittingly been following the eclectic path that Atkins (1984) describes for research practitioners, but without seeking to underpin the work with any formal methodological approach. This left me in the position that many practitioners face (Bartunek, 2007): almost intuitively knowing what should be

done, but not being able to show in any evidential way that it is a reasonable thing to do; doing so perhaps exemplifies the transition from practitioner to research practitioner. Another issue for research practioners is that problems seldom present themselves in isolation; they are normally part of a larger (perhaps institutional) context. Schön (1991) introduced the concept of the reflective practitioner and suggested that to address a problem the issue should be framed so that the bounds of the phenomena are clear in order that a research question can be constructed and then addressed.

As Pritchard (2002) points out there are a number of issues facing those conducting research in their own workplace as practitioner researchers and I have encountered all of these to a greater or lesser extent.

With respect to the dual challenge of doing research and achieving a practical goal (Pritchard, 2002) I found it at times very difficult to balance the needs of spending the time to properly set up a piece of research against the work pressures of having to achieve something. For example (see section 7.5) it was clear from informal feedback that the fECAF costing and pricing system was by 2008 no longer fit for purpose and so it was agreed to purchase a replacement system. However a review of exactly what was good and not so good about fECAF was not undertaken until many months after the new system (pFACT) had been procured.

The ability to get the co-operation (and even the time) of others (Pritchard, 2002) is an issue in the workplace for achieving goals that are directly work related. I would argue that it is an order or magnitude harder to elicit time from busy people when the goal is a research one and only indirectly work related, although working in an academic institution this target was at least seen by most in a positive light.

In terms of the ethical issues of interacting with research subjects (Pritchard, 2002), this was much less of a problem for me, I just had to be clear with them what the goals of the data collection were.

Pritchard (2002) also notes that often practitioner researchers change their plans on the basis of early data collection. This can perhaps be characterised

by poor planning in the early stages, but for the practitioner researcher I would argue that actually this is in fact a learning experience, helping to frame the research question.

Put another way this can be characterised as not knowing at the outset what data needs to be collected or what the line on enquiry is. I certainly encountered this issue. I started with the vague notion that ERA systems could positively impact on the quantity of research undertaken and spent the best part of a year trying to work out how such an assertion (when it was refined) could be tested. There is some evidence of this still in the report, for example with the reframing of the questionnaires with words such as “improve” becoming “increase”.

Often practitioner researchers have access to more data than they could possibly use and this can lead to serendipitous findings. Certainly during my studies I have answered questions that I was not aiming to, for example originally I was not concerned with which specific areas of ERA systems were perceived to have a positive effect on the quality and/or quantity of research. However in constructing the questionnaires to define and give examples of what ERA systems are it was natural to ask about these various systems and so, almost as a by-product of the overall question the results (described in chapter 6) have helped to inform which areas of ERA system are perceived to be most (and least) effective.

Preserving anonymity and confidentiality can also be a problem (Pritchard, 2002), however this was not a particular issue in data collection for me as none of the data were particularly personal. Nevertheless there are items in my portfolio (for example the details of the two people that I have mentored over the period) which are not reproduced in full.

Pritchard (2002) identifies the potentially huge problem of others at the institution not being interested in or indeed being opposed to the research being undertaken and putting blocks in the way, particularly when the results might impact on people’s jobs. This could potentially have been a problem for me, had the results indicated that ERA system had no effect, or even worse a negative effect on the quality and/or quantity of research undertaken; this could

have directly impact on both me and my staff. It turned out though that they were genuinely interested in finding out how they could better perform their various jobs and whether or not the tools they were using were helping or hindering.

Finally, it seems that according to Fink (2006, p.38) as a practitioner researcher undertaking a professional doctorate, I needed to have broad focus, requiring "much study about much". And certainly that is the way the last few years have felt.

5.3 Research Question

In order to address the research question ***"is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research"*** there are a number of possible approaches and indeed for a practitioner researcher, Atkins (1984) advocates an eclectic approach. However, initially we must define the various elements of the research question. Given that Electronic Research Administration (ERA) has been defined in section 4.1 as "the use of IT system(s) designed specifically to support research management or administration", only: "research quality", "research quantity", and those that might perceive an effect, need defining. Starting with the last, there are numerous stakeholders that might be in a position to perceive such an effect; however the obvious candidates are RMAs themselves. There are two main advantages of selecting this group: they are normally involved in the measurement of research quality and quantity as part of their work; and as an RMA practitioner I have access to a large number of other RMAs. However it may be argued that it would be biased to ask those who as RMAs may well have been closely involved in the development and/or procurement of such ERA systems and so it would also be prudent to include the perceptions of another group. Members of academic staff are ideally placed as they are also likely to have an opinion of the utility of ERA systems that they may use, and hence have been selected as a second group.

5.3.1 RMAs and Academic Staff

As a research manager and administrator (RMA) myself I postulated that ERA systems might be able to affect the quality and quantity of research. Initially I determined to ascertain whether my view was in the majority or not and hence a research question was formed "do RMAs believe that ERA can increase the quality and quantity of research" undertaken. This was tested with a survey of ARMA members (see section 6.2). Whilst the membership of ARMA is not congruent with the set of all RMAs it is argued that the former is representative of the latter in the UK, as in effect ARMA has grown to be the professional association of RMAs in the UK (see section 3.9). However, whilst the views of RMAs on the subject of research are useful, feedback from the ARMA survey (and indeed from my doctoral supervisors) suggested that it would also be informative to ask for the views of those actually undertaking the research; academic staff.

Members of academic staff are only a subset of those that undertake research in the UK, with research also being undertaken in companies, the third sector and elsewhere. Academic staff are however arguably the most informed such grouping and undoubted the largest. The research question was refined to be *"is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research"* and this was tested by a UK HEI survey (see section 6.3).

These two groupings (RMAs and Academic Staff) were chosen as it was anticipated that their views might differ due to their backgrounds. RMAs might well be more predisposed as to the potential benefits of ERA systems as they may have been instrumental in the implementation of such systems. Academic staff on the other hand might view such systems as constraining or indeed encroaching on their domain and hence may view ERA as just more bureaucracy. In summary it is posited that the views of those undertaking research and those tasked with the management and administration of research provides some triangulation on the perceived affects of ERA systems on research quality and quantity.

5.3.2 Measuring the Quantity of Research

Quantity, is by its very nature something that can be measured, however there are still questions to be addressed; what measure should be used. Many HEIs would suggest that the value of research income[21] is the de facto measure of research quantity. It has the advantage of being relatively easy to measure, and indeed reported in the annual accounts of most Universities. However there are problems with this view, it ignores institutionally funded research and may also be affected by other factors, for example does an equipment grant for £1M really mean that twice as much research is being undertaken when compared to a £500K grant employing 3 full time researchers? Other proxies could be used such as the number of researchers; but are all researchers equally productive? HESA (2012), suggest that PhDs awarded and externally funded research income are suitable measures for research output performance. Or perhaps other output measures such as the number of journal articles produced could be used. For example, Abbott (2003) describes in Australia how publication could be used to measure quantity and in particular quality, however Frey (2008) concludes that publication output is not a reliable indicator of research quantity. Does a 50 page journal article equate to the same quantity of research as a 10 page article, or five times the amount; almost certainly neither is the case. It is clear that measuring the quantity of research is actually quite difficult as it is not clear what quantity means in this context. However, notwithstanding the problems with the interpretation, externally funded research income could be deemed to be a reasonable proxy for research quantity and indeed is often used in league tables, see for example Baty (2011) and OECD (2010). It should however be noted that whilst it is suggested that increasing research income equates to increasing research quantity, those providing their perceptions can be more holistic in their interpretation of what research quantity means when responding to the questionnaires.

[21] The term 'research income' is used here as a short hand for 'research income for which there is eligible expenditure'; in effect this equates to what would show in the annual accounts of an organisation under the heading of 'research income'

5.3.3 Measuring the Quality of Research

Looking at the quality of research, on the face of it this seems even more intractable than trying to measure the quantity. Can one piece of research be deemed to be better than another? Can it be assessed as being twice as good? Can a piece of social science research be equated in any meaningful way to a piece of theoretical physics? It has been argued by successive UK Research Assessment Exercises (RAEs) (HEFCE, 2008) that the first and last of these can to a certain extent be achieved. See Scoble (2002) for an expansive discussion on the pros and cons of various measures of research quality and quantity, and Mills (2006) for the development of research assessment in the UK. The process of assessing research to determine its quality is however not trivial, requiring a large amount of expert review and is only undertaken at a national level in the UK every six or so years through the RAE[22].

It should be noted that the UK approach to research assessment is not universal, with other countries taking different approaches (Geuna and Martin, 2001). Indeed the approach within countries can vary over time, as has happened for example in Australia (Butler, 2008). The UK system does though provide a possible mechanism for comparing research quality, particularly between like departments in different institutions (Reidpath and Allotey, 2010). Again, those responding to the surveys are, due to their backgrounds, expected to have a shared understanding of the meaning of research quality; however this assertion has not been tested.

5.4 Positivist Research Philosophy

There are a number of underlying philosophical approaches to research but the one that best suits my personal view of the world is that of positivism. The positivist approach is for example advocated by (Yin, 2009) where the assumption is that the researcher can observe and measure things in an independent manner; a hypothesis is developed, a research question is formed and then tested by empirical means. So, a mainly positivist approach is taken,

[22] From 2008, the RAE is known as the Research Excellence Framework (REF)

for as we shall see it fits well with case studies which, due to the nature of the work, are already implicitly a chosen method; and has been for the majority of information systems researchers (Dubé and Paré, 2003). However, case studies represent only one facet of the work.

5.5 Mixed Methods Approach

Whilst the main thrust of the approach is case studies, because of the complex nature of the environment a Multimethod (Brewer and Hunter, 1989), now more commonly known as Mixed Method (Tashakkori, 2009) approach is utilised. A number of potential methods suitable for use in information systems research are described by Straub, Gefen et al, (2004) and in effect the overall approach utilised is that described by Yin (2009, p.117) as 'Convergence of Evidence'.

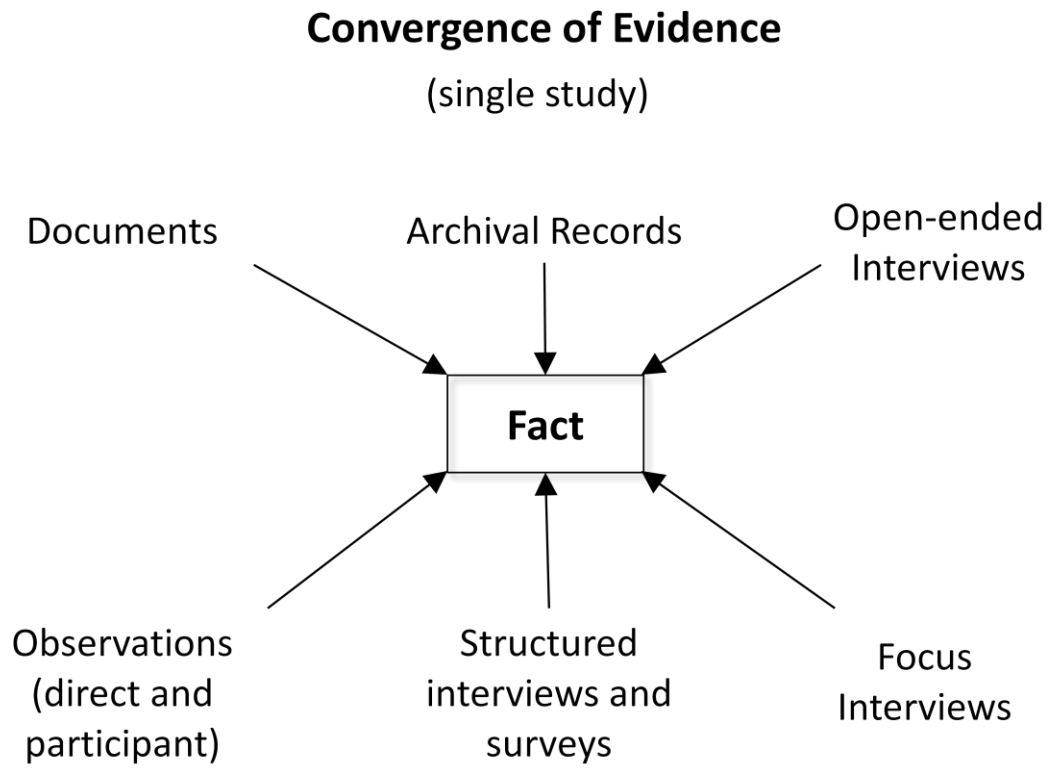

Figure 6: Convergence of multiple sources of evidence, after Yin (2009, p.117)

The sources utilised in this work comprise: documents, archival records, observations, surveys and focus group work. Extensive structured interviewing was not utilised, and could be an area for future work. It should be stressed however that for the mixed methods approach to be robust it is not necessary

for all six data collection methods to be utilised; two may be sufficient. Indeed there is a trade off between capturing all the possible data and the resource implications of doing so. This overall multi-method approach is also described by Brewer and Hunter (1989) in terms of triangulation, collecting evidence from different sources (often using varying methods) to provide a greater insight into the question in hand; for example by eliciting information in focus groups and also conducting a survey.

One approach for eliciting data from people is to interview them individually rather than work with groups or use surveys. As with many qualitative techniques there are a range of options. Yin (2009) describes three in the context of case studies: in-depth interviews; focussed interviews and structured interviews. The latter is akin to a questionnaire where the interview is guided by an interviewer rather than the subject being free to discuss any topic. A focussed interview is more free form, but still guided by an interviewer in order to cover specific issues, whilst an in-depth interview leans more towards grounded theory and may spread over a number of time periods. It is clear that interviewing could be a sensible method for this work if the focus were to understand why ERA systems might affect the quality and quantity of research undertaken, and indeed this could prove a fruitful avenue for future work. However the question is whether or not there are perceived effects and so the resource intensiveness of interviewing is not required; inferences can be drawn from vignettes collected during case studies (Cousin, 2005).

The overall mixed methods research approach used is shown in Figure 7 below and more detail of the instruments used and how these related to portfolio items is given in Figure 8.

Figure 7: The Mixed Method Approach used with Portfolio references

In summary the overall approach for the research work is that of mixed methods as defined by Creswell and Plano Clark (2007, p.5), it *"focuses on collecting,*

analysing and mixing both quantitative and qualitative data in a single study or series of studies". There are various ways of combining the data and appropriate methods should be utilised depending on the overall approach, the data and the research question being addressed. During this work a number of different methods are utilised at various points, but the overarching method is to combine the different types of data in case studies (see chapters 7 and 8) as espoused by Kaplan and Duchon (1988) for research on IT systems. Creswell and Plano Clark (2007) go on to define four main types of mixed methods design: Triangulation, Embedded, Explanatory and Exploratory; which in turn have various sub variants. Johnson and Onwuegbuzie (2004) provide an ontology for mixed methods research, later work by Johnson, Onwuegbuzie et al, (2007) gives an excellent overview of definitions of mixed methods and also espouses triangulation as a key theme. Whilst inherently the overarching approach for the professional doctorate as a whole is that of a single descriptive case study, this is used here within a mixed methods research paradigm to aid triangulation.

The various methods used are outlined below.

5.5.1 Case Studies

As I work in a central service of a University I cannot realistically (without a prolonged sabbatical) undertake effective Action Research or Ethnographic Research and so a Case Study approach is used; (Yin 2009, p.11), *"The case study is preferred in examining contemporary events, but when the behaviours cannot be manipulated"*. In particular a descriptive, rather than causal, case study approach is used as the research question does not call for causal links to be determined, a beneficial side-effect is that the former tends to be easier to conduct (Gerring, 2004). Two case studies are presented in this doctoral report, both pertaining to different aspects of the ERA systems that I introduced at Sunderland. In chapter 7 the Costing and Pricing area is discussed and chapter 8 presents the publication information area.

5.5.2 Surveys

Again the use of surveys is implicitly required due to the nature of the research question, to ascertain the perceptions of subjects. The success of this approach depends on a number of factors, see for example Gillham (2000), Strauss and Corbin (1998) and Oppenheim (1992); but can perhaps be summarised as asking a sufficient number of the right people the right questions. If these subjects have experience of, or ideally have undertaken research themselves in the area, then their perceptions could be argued to provide evidence that ERA does (or does not) affect the quality and quantity of research and this could be a fruitful avenue for future research. We have seen however in chapter 4 that there has been little research done in this area and so any results obtained from such a survey must be taken as being perceptual rather than primary evidential. The use of Likert (1932) scales was used to gauge the perceptions of the respondents.

5.5.3 Archival Analysis

The systematic analysis of documentary material or other evidence depends on being able to access such data with certain provenance (Bearman and Lytle, 1985). In this case there is a large body of data available from the 16 years usage of the ERA systems at Sunderland (systems that I developed). However the data in the systems relates to information used for research management and administration purposes and not explicitly to answer the research question "*is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research*". It is quite possible however that analysis of the data could address the research question directly, or at least provide supporting evidence for another method (Yin, 2009).

As an adjunct, archival analysis also been used, explicitly, throughout the period of these doctoral studies in terms of gathering evidence for the portfolio, see for example (ARMA34, ERA04 and Hist03). A systematic approach of reviewing email and electronic file archives (and where necessary, hard copy archives) has resulted in unearthing a number of pieces of evidence, including some that the author had forgotten about entirely. These were then sifted in order to produce

a balanced selection that provides evidence of the work described in this report. There were inevitably some missing pieces from this record and indeed areas where further work needed to be undertaken and so other items for the portfolio were specifically generated or solicited from others.

5.5.4 History

A historical account can provide insights into developments and decisions made (Yin, 2009). This can be all the more powerful if conducted in an autobiographical manner looking back on events (Moon, 1999). For the parts of the work that occurred prior to the start of doctoral studies (2008) this is a natural approach and is almost explicitly involved in all professional doctorates in the form of reflection as described in section 5.1 above, and exemplified in chapter 2. As a reflective practitioner I took the time to look back at how the ERA systems at Sunderland were developed under my direction (see section 4.5) and to reflect on those developments (see section 4.6) in order to inform my doctoral studies and in particular to help form the research question.

5.5.5 Mixed Methods Summary

The overall research approach taken consists of two stands of work utilising four research methods, see Figure 8 below. A *Historical* method (see section 5.5.4) is used to reflect on the work prior to (1995-2008) and to a certain extent during the doctoral period (2008-2011). This reflection led to the development of the hypothesis that ERA could affect the quality and quantity of research undertaken, from which the research question was formed. One strand of work, taking major input from the reflection and *Archival Analysis* (see section 5.5.3) mainly of the GRSdB are the two *Case Studies* (see section 5.5.1). The other strand comprises a series of national *Surveys* (see section 5.5.2) into the perceptions to ERA systems.

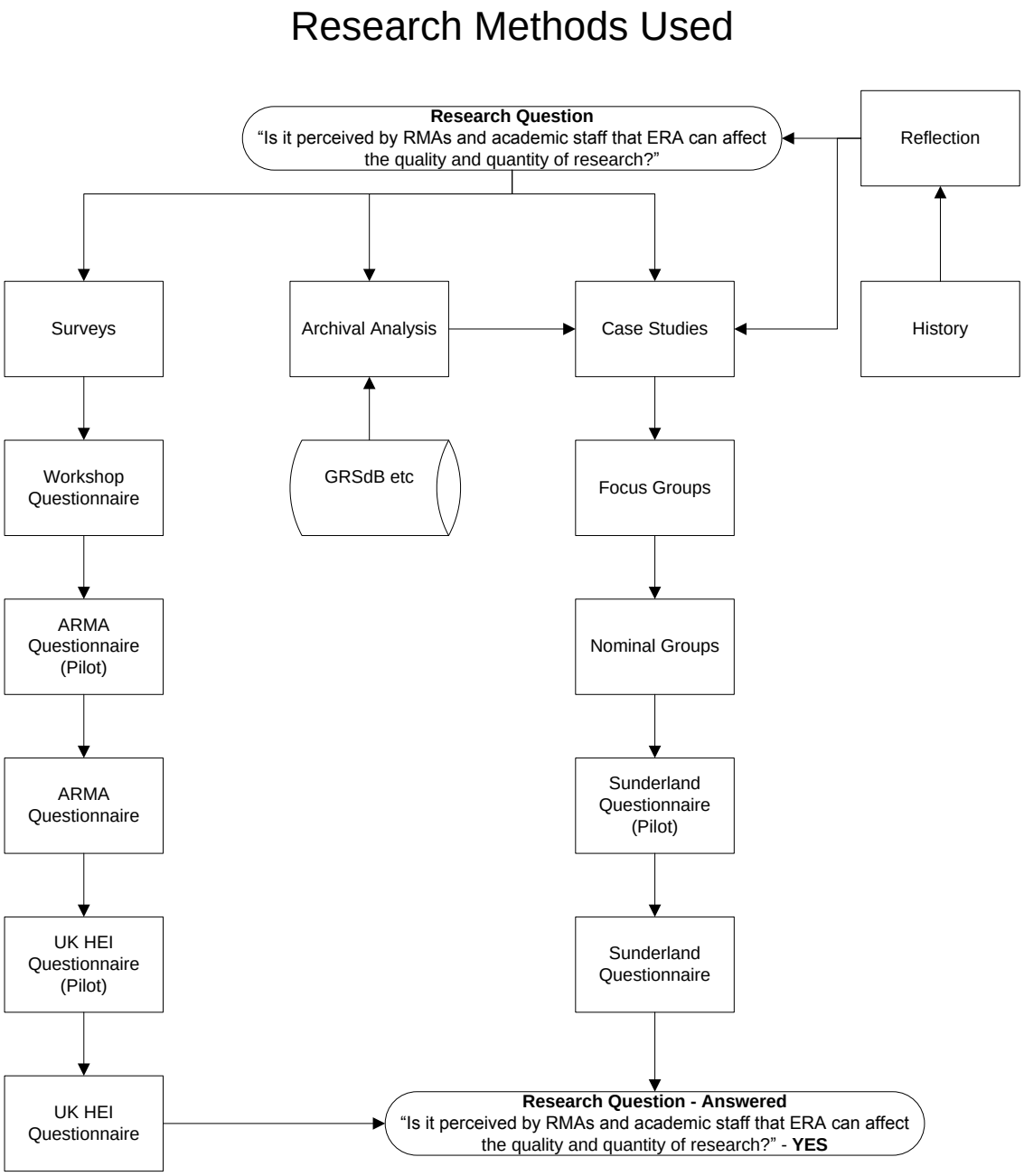

Figure 8: Relationship between the Research Methods Used

These strands are combined to address the research question "*is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research*".

5.6 Reflection on Research Approach and Methods

In the above sections I have described the approach and rationale for the approach to addressing the research question of "*is it perceived by RMAs and*

academic staff that ERA can affect the quality and quantity of research" undertaken. Some considerations are methodological and others are more pragmatic in terms of the environment in which the research is to be conducted. Due to the complexity of the situation it is perhaps almost inevitable that a mixed method approach (Johnson, Onwuegbuzie et al, 2007) was deemed to be most suitable (Creswell and Plano Clark, 2007).

In the past, as a practitioner, I may well have been prone to starting a major task too quickly, without considering the robustness (in research terms) of the approach taken. However as a reflective research practitioner it was important for me to explore the various possible approaches in a critical manner comparing them against my experience of similar projects in the past. So, before reverting to a positivist philosophy, both interpretivism, see for example Walsham (1995) and Klein and Myers (1999), and critical social, see for example Ngwenyama and Lee (1997) and McGrath (2005) philosophies were considered see also Orlikowski and Baroudi (1991) for an excellent analysis of all three philosophies in an Information Systems context.

Similarly, other methods were also considered. In the information systems arena Myers (1997) suggests three alternatives to Case Studies: Action Research, Ethnography and Grounded Theory. Action Research (Rapoport, 1970) is more suited to interventional research perhaps leading to organisational change (Cummings and Worley, 2005); and whilst organisational change may well be an outcome of introducing ERA systems, that is not the focus of this research, we are interested in whether or not it is perceived that the quality and/or quantity of research is affected. Ethnography (Genzuk, 2003) in an information systems setting (Myers, 1999) is where data is collected from observing participants, whereas here we are explicitly asking about their perceptions rather than trying to infer them. Grounded theory (Corbin and Strauss, 2008) looks to construct theories from observation rather than test hypotheses as in this case. However it could be argues that my original hypothesis came from a grounded perspective.

As well as Surveys, Archival Analysis, Histories and Case Studies, Yin (2009) also suggests Experiments. Had the research question been couched in

different terms (“does ERA affect…” rather than “is it perceived…”) then an experiment with a control may have been appropriate. However there are serious practical issues with setting up such an experiment where one subset of users benefited from the use of an ERA and another set were denied such. A possible approach could be to use two (or more) Universities with different levels of ERA system. Gibson (2011) does report such findings, but the number of other variables not accounted for cast doubt on the validity of the findings. There is a similar problem if within a single University some users could be persuaded to do without the support of an ERA; it would still be extremely difficult to identify two comparable groups with sufficiently similar attributes to make the experiment valid. The identification of these practical difficulties helped to shape the final research question in terms of perceptions rather than absolutes in order to make the question more tractable, using the methods indentified in Figure 7Figure 8Figure 7.

In summary to address the research question “*is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research*” a mixed method approach has been adopted within the framework of a single case study (see Figure 7 and Figure 8 above). Documents and Archival Records (including participant observations) are already in existence and so only Survey and Focus Group work are needed to cover the majority of the types of evidence that Yin (2009) identifies, see Figure 6. Note that open-ended interviews have not been used but could be an avenue for future work.

5.7 Sunderland Case Studies

Rather than a single case study of the entire ERA systems at Sunderland the pragmatic decision was made to look at specific sub-systems. Two such sub-systems were being upgraded (during 2010 and 2011) and so there was a natural opportunity for getting input from members of staff in order to inform the development of the new systems whilst at the same time gathering research data. This enabled a greater level of input than would otherwise have been achieved. Hence the focus group work (section 5.7.2) was designed around

these two systems and the follow-on questionnaire (section 5.7.3) followed the same themes.

The Costing and Pricing case study is covered in detail in Chapter 7 and the Institutional Repository in Chapter 8.

In the following sections the other methods used in the Sunderland Case Studies (Focus Groups and a Survey) will be discussed. To further strengthen the triangulation a separate but related series of surveys (section 5.8) was also run throughout the UK and the results are described in chapter 6.

5.7.1 Focus Groups

Whilst a researcher may think that they know what to ask in order to address their research question it is often insightful to take advantage of the input of others. A common method of eliciting information from users (in this case users of systems) is to set up a focus group, see for example Gibbs (1997), or indeed a series of focus groups. Powell and Single (1996, p.499) define a focus group as *"a group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research"*. This can be done in order to achieve a different perspective in terms of Yin's (2009) convergence of evidence, see Figure 6. Further, focus groups can, through the use of the nominal group technique, developed by Delbecq and Van de Ven (1971) and described by Sample (1984), actually help distil issues (Kidd and Parshall, 2000) and hence provide input into different aspects of a multi-method approach. This bottom up, emergent, approach can help to provide insights into areas that a researcher might otherwise overlook. However, this is a secondary consideration, we are mainly interested in addressing the research question "is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research"; rather than, for example, finding out about how such systems are used. Although, this latter point has been addressed; see for example (FG02, FG03).

5.7.2 Focus Group Design

Within the Case Studies the Focus Group work was designed to look at the introduction of two new ERA systems at Sunderland. The purpose of holding focus groups was twofold: to receive some direct feedback from users about the previous ERA systems at Sunderland; and specifically to identify areas for a wider survey of staff across the institution.

The design and implementation of the focus groups is detailed in (FG02) and so only an overview is provided here.

Three groups of staff were identified: Senior Managers (group A), Academic Staff (B) and Administrators (C), each representing a set of users with a different perspective on the systems. Group A have the role of approving data that is linked to group B and created on the system by them, or by group C (on behalf of group B). Group A were gathered initially to discuss the overall approach and it was then agreed that a formal focus group of senior managers was not be required; they were happy to be guided by their academic (group B) and administrative (group C) colleagues. This is perhaps unfortunate as their interactions with the systems, as approvers, are different from their colleagues in groups B and C. This attitude could be taken as tacit acceptance of the systems but it seems more likely to reflect an understanding that the systems are required and that any suggested improvements from the other groups would also improve their experience. An open call was issued to all staff and the response from academic staff was such that two focus group Bs (B1 and B2) were formed together with a single focus group C for administrators.

Each 90 minute focus group session was arranged in two blocks of 45 minutes each, the first devoted to Costing and Pricing and the second to Publications (Institutional Repository). After a 5 minute introduction I left the room to avoid influencing the group, leaving a neutral moderator to manage the session. The role of the moderator is crucial to the success of focus group work. Moderators need to have knowledge of the subject, be good listeners and leaders, and build a rapport with the participants (Dawson, 1993), and they should be as independent as possible to reduce the risk of bias (Dean, 1994). Staff worked in groups to identify issues and then these were collected into half a dozen or

so themes. Then issues were 'voted' for by each focus group member with sticky blobs in a nominal group process. Afterwards the issues and votes were transferred to a spreadsheet for analysis and used to inform the construction of a questionnaire (see section 5.7.3 below) to gather views from a wider audience through the Sunderland survey.

I returned at the end of the session to answer any specific issues and took the opportunity to raise some specific questions around whether or not participants thought that either of these ERA systems could affect the quality or quantity of research to gain feedback in relation to the research question. These responses were noted independently and are presented in case study chapters, in particular see section 7.5.

5.7.3 Sunderland Survey

The nominal group work (Delbecq and Van de Ven, 1971) in the focus group sessions (Gibbs, 1997) brought together key issues about the systems (and indeed about electronic support systems in general). These issues were incorporated into a questionnaire (FG01) about the usage of the two systems together with questions on whether respondents thought that they were useful or indeed could affect the quality and quantity of research. It was trialled with the focus group members and then rolled out to academic staff as well as research managers and administrators in the university. The analysis of the (31.9% [n=155]) responses (FG03) was submitted to the University Business Systems Strategy Group as an agenda item to inform future decisions on the development of electronic support systems in general.

5.7.4 Sunderland Survey Design

The survey utilised SurveyMonkey[23] to develop the online questionnaire (based on previous work on the ARMA Survey, see section 5.8.2 below). After the questionnaire was piloted (and some minor changes made) the full survey was developed. A full list of University of Sunderland academic staff and RMAs [n=486] was exported from the GRSdB and imported into SurveyMonkey with

[23] www.surveymonkey.com, accessed 31st Dec 2011

email addresses in order that automated reminders could be sent. The survey was opened on 25th October 2010, with two reminders being send (1st November and 15th November) before the survey was closed on 19th November 2010. The response rate [n=155] from 486 was reasonable at 31.9%. The techniques used to analyse the results of the Sunderland survey are the same as those used n the ARMA survey, described in section 5.8.2 and detailed in Kerridge (2010d)/(ERAQ04). The analyses of the results of the Sunderland Survey are presented in (FG03) and they were fed back to the focus group members (and those respondents who indicated that they would like a copy). This analysis is also discussed in relation to the national surveys in section 6.4 and in the context of the two case studies in sections 7.5 and 8.4.

5.8 National Surveys

In a separate but related strand of work, a series of surveys were developed and implemented across the UK in order to determine the perceptions of stakeholders to ERA systems in general. These surveys are aimed specifically at addressing the research question, whereas the Sunderland survey described in section 5.7.3 above was designed to provide input into the case studies. The results of this work are detailed in chapter 6 and the methodology is outlined here. The detail of the research methods used in the various surveys can be found as follows:

- Workshop Survey: (Kerridge, (2009b)/(ERAQ03), see also section 5.8.1.
- ARMA Survey: (Kerridge, 2010d)/(ERAQ04), see also section 5.8.2
- UK HEI Survey: (Kerridge, 2011a)/(ERAQ06), see also 5.8.3

The initial Workshop survey [n=22] was used to test the hypothesis that "ERA can affect the quality and quantity of research undertaken", this led to the ARMA survey [n=624] to gather a larger dataset from research managers and administrators for statistical analysis. Subsequently the UK HEI survey [n=191] was undertaken in order to determine if the opinions of academic members of staff differed from those of RMAs as it is possible that RMAs might be positively biased towards systems that they manage.

5.8.1 Workshop (Initial) ERA Survey

A preliminary questionnaire (ERAQ08) was developed and used (Kerridge, 2009b)/(ERAQ03) at the 2009 ARMA conference in a workshop session (Kerridge, Golightly et al, 2009)/(ERA18). Based on feedback from that and using guidance from Oppenheim (1992) and Gillham (2000), a fuller more detailed on-line questionnaire was developed to survey the entire ARMA membership. No complex statistical analysis of the Workshop survey responses was undertaken due to the small sample size; however some basic analysis was conducted (see section 6.1) and details can be found in Kerridge (2009b)/(ERAQ03). The main purpose of this survey was to test if there was any validity to the hypothesis that ERA systems can affect the quality and quantity of research in order to frame the research question such that it could be effectively addressed.

5.8.2 ARMA (Main) ERA Survey

Following on from the preliminary study from the Workshop Questionnaire a larger survey for the wider ARMA membership was constructed with more in depth questions and capturing demographic data to aid in analysis. This ARMA questionnaire was originally developed as a Microsoft Word template and piloted with some of my office staff and then converted into an on-line questionnaire to aid data collection.

The ARMA survey (ERAQ01) was run in March 2010 and was open to all 1,515 ARMA members with valid email addresses. The data were collected through the SurveyMonkey on-line tool, downloaded into Excel, sanity checked (for example a submission that selected the first option to every question would have been rejected) and uploaded [n=624] into SPSS for analysis.

The resultant data were highly skewed towards the agreement end of the scale and the responses were ordinal rather than interval or ratio measures and so for significance, non-parametric tests were used, in accordance to the guidance given by Brace, Kemp et al. (2000), Field and Hole (2003) and Kinnear and Gray (1999). So, Wilcoxon tests were used to determine significant differences between answers on the non parametric Likert scale used for gauging

agreement to statements in the questionnaire. Mann-Whitney tests were performed to compare answers to individual questions by subsets of the respondents (for example did more experienced RMAs respond differently to those with less experience?). Spearman's rho was used to determine correlation between parts of the questionnaire to test the consistency of the responses. The results of these tests can be looked at from either a one- or two-tailed perspective; in these analyses we are looking for any difference between results (positive or negative) and hence the two-tailed perspective was used.

The results of the analysis are outlined in section 6.2 and the detail, together with further statistical justifications can be found in Kerridge (2010d)/(ERAQ04), with a summary in (ERAQ05).

5.8.3 UK HEI (Academic) ERA Survey

Together with a number of the respondents to the ARMA questionnaire, see Kerridge (2010d)/(ERAQ04), I posited that it would be enlightening to ask the 'users' of RMA and ERA services what they thought of them. The largest such user base is of course academic staff and so I determined to run another survey with academic staff in order to ascertain whether they had views that were comparable with those of RMAs. After feedback from the ARMA questionnaire (section 6.2) and discussions with RMAs from a few HEIs it was decided that the list of sub-areas should be expanded and that the questionnaire should be shortened. This meant that the UK HEI questionnaire would be materially different from the ARMA questionnaire and so as well as inviting academic staff to undertake this new UK HEI questionnaire (ERAQ02), RMAs were also invited to do so to enable comparisons between the responses of the two groups.

This new UK HEI survey was piloted, through a lead RMA at each institution who selected a few other RMAs and academic staff to trial the revised questionnaire. One problem that the pilot showed up was that the automated emails sent from SurveyMonkey were not received by a number of institutions (presumably being picked up as spam) and so it was decided to just use locally generated emails with a generic web link. This had the unfortunate side effect

of not being able to target reminders and also not automatically knowing which institution a respondent was from. It was hoped that sufficient respondents would indicate their HEI in the optional fields at the end of the questionnaire; however this was not the case.

Other than that technical issue, after a few minor textual adjustments based on feedback from the pilot, the UK HEI survey went live. Seven HEIs covering a good cross section of institution types (Keele, Glasgow, City, Glasgow Caledonian, Southampton, Edge Hill and LSE) specifically wanted to use it, although it was open to all.

The equivalent analyses were conducted as for the ARMA Survey and the results of this UK HEI ERA Survey are discussed in section 6.3. Detailed results and statistics are available (Kerridge, 2011a)/(ERAQ06) and are summarised (ERAQ07) in the portfolio.

5.9 Summary

The environment in which this work was undertaken determined, to a large extent, the research methods used. There are two distinct strands of work: two case studies of ERA systems at Sunderland; and a UK wide series of surveys looking at perceptions to ERA systems in general.

For the former the overarching research deisgn is one of a single case study (Yin, 2009) using mixed methods (Creswell and Plano Clark, 2007), (Johnson, Onwuegbuzie et al, 2007). Documentary and archival material were used in each case study (see chapters 7 and 8). Focus groups (FG05) were used to identify issues and inform the construction of a questionnaire (FG01) that was used to survey all academic and RMA staff at Sunderland. This was then analysed and used to inform (FG03) the development of the new ERA systems.

The national surveys of perceptions to ERA (and more generally RMA), comprised a series of three surveys. The Workshop Questionnaire (ERAQ08) was trialled in a conference workshop session (Kerridge, Golightly et al, 2009)/(ERA18). This informed the ARMA Questionnaire (ERAQ01) that was run

nationally with RMAs. This in turn was then further developed into the UK HEI Questionnaire (ERAQ02) to canvass opinion from academic staff as well as RMAs.

In conjunction with these new pieces of research, archival analysis and reflection were used to select and construct the portfolio that provides evidence for the professional development aspects of the work, see Figure 7 above.

6 ERA SURVEYS

This chapter outlines the work on the perceptions that Research Managers and Administrators (RMAs) and academic staff have about the effect that Electronic Research Administration (ERA) can have on the quantity and quality of research undertaken at an institution. As described in chapter 5 the approach adopted to elicit perceptions was survey work through questionnaires. After an initial workshop questionnaire (see section 6.1) a much larger online survey (see section 6.2) was conducted with the ARMA membership and this was followed up by further national survey of UK HEIs (see section 6.3) including academic staff as well as RMAs. It should be noted that the phrasing of the questions developed over time with the overall aim being to determine perceived effects of ERA. However, the workshop questionnaire asked about "positive effects", the ARMA Questionnaire used the word "improve", and the UK HEI Questionnaire specifically asked about "increase or decrease".

In a parallel strand of work as part of the case studies a similar survey of the perceptions of academic staff and RMAs at Sunderland was also undertaken (see chapters 7 and 8), again using the words "increase" and "decrease".

The way in which the surveys relate to each other is depicted in Figure 7 and Figure 8 in Chapter 5.

It should be noted that the three surveys described in this chapter have been renamed post hoc with more meaningful names, however items in the portfolio and in the public domain still retain the original names. The workshop questionnaire (see section 6.1) was originally called the Initial Questionnaire (ERAQ08). The ARMA Questionnaire (see section 6.2) was originally the Main Questionnaire (ERAQ01) and the UK HEI Questionnaire (see section 6.3) was originally the Academic Questionnaire (ERAQ02). Similarly the Sunderland Questionnaire used in the case studies was originally entitled the Focus Group Questionnaire (FG01). It should also be noted that the term 'ranking' has been used in this chapter as shorthand for 'the order in which sub areas appear when

listed (from large to small) by the percentage of responses' as opposed to the order in which sub areas were ranked by individual respondents.

6.1 Workshop (Initial) Questionnaire

At a workshop session that I organised at the 2009 ARMA conference (Kerridge, Golightly et al. 2009)/(ERA18), I introduced the suggestion that Electronic Research Administration (ERA) could improve the quality and/or quantity of research undertaken, rather than just make research management and administration more efficient. This was complemented by a poster (Kerridge 2009a)/(ERA23) which posed the same hypothesis and postulated various impacts for seven sub areas of ERA. The sub areas used are:

a) academic expertise information (Expertise Information)
b) pre application funding source identification (Pre-Award)
c) costing of grant applications (Costing)
d) internal peer review and ethics review (Peer Review)
e) applications and awards management (Award Management)
f) post-award financial management (Post Award)
g) outputs and impact recording and archive (Outputs Recording)

and were derived from the elements identified by the HEFCE funded RMAS (2010) project in the analysis of what a fully scoped ERA system should contain (Binge, 2009).

During the workshop a short questionnaire (the Workshop Questionnaire - ERAQ08) was presented and discussed and completed by some of the participants [n=22]. At the end of the workshop a show of hands gave the overwhelming conclusion that Peer Review was the most promising area for ERA systems to improve the quality of research. This was confirmed by a subsequent analysis of the workshop questionnaire responses, see Kerridge (2009b)/(ERAQ03) for details, however the survey size [n=22] did not provide compelling statistics. But, as far as the overall aim was concerned the workshop participants agreed that ERA can affect the quality and/or quantity of research undertaken.

Hence, a fuller questionnaire with a larger sample size was planned.

6.2 ARMA (Main) Questionnaire

A much larger, four page questionnaire (Kerridge 2010) (ERAQ01) was developed and piloted on some local users, initially in the form of a Microsoft Word document and then using the web based tool SurveyMonkey. I arranged to use the ARMA membership email list to send requests for responses to the questionnaire, with a covering note from the Chair of the Association. After the initial request was sent, two further reminders were sent to those that had not responded and those that had started but not completed the questionnaire.

During Feb 21st and Mar 23rd 2010, 624 (41%) responses (from 1,515 possible) were received, with 477 (31%) completing all of the sections. This was a reasonable response rate, in line with Archer (2008), who found that of 40 needs assessment type web-based questionnaires a mean response rate of 39.7% was achieved.

The detailed analysis (Kerridge 2010d)/(ERAQ04) of the ARMA questionnaire responses and data collection process is available on the ARMA website together with a summary (ERAQ05). It should be noted that (notwithstanding the piloting process) the wording used in the ARMA Questionnaire (ERAQ01) did not make it clear how a response of a perceived negative impact (ie an effect was perceived, but that it would lower the quality or quantity of research undertaken) should be indicated. This potentially fatal flaw is mitigated by the fact that four of the possible six possible responses to the questions were clear and that the remaining two (which, depending on how the question was interpreted could each be assigned one of two meanings: certainty of no effect, or negative effect) account for only 2.2% of the responses.

Overall the responses indicate overwhelmingly that Research Managers and Administrators (RMAs) believe that the activities of RMA (and hence RMAs themselves) can improve the quality and quantity of research undertaken and that Electronic Research Administration (ERA) can further improve both aspects. The overall position [n=486] was that RMAs believe that RMA can

positively affect quality (91.2%) and quantity (92.0%) in almost equal measures and that ERA can further positively affect quality (78.8%) and quantity (85.0%).

In terms of the analysis of the effects of ERA systems in each of the seven identified subareas of research management and administration it is clear that in terms of affecting quality and quantity the top three areas were perceived to be: pre application funding source identification; costing of grant applications; and post-award financial management (although not in the same order of preference).

It is interesting to note that these are three areas that are well catered for in terms of existing systems, so it is possible that the respondents may have been biased towards these areas by their experience of them. However Outputs Recording is also well catered for so its appearance lower down the rankings is more likely to be where its actual perceived effect is ranked. Whereas Peer Review is poorly catered for by ERA systems and this appeared much lower in the rankings (for effect on quality) than it did in the workshop questionnaire work described in section 6.1 above. Perhaps respondents were less able to envisage the possible effects of a yet-to-exist system than an existing one that they may have used.

A number of responses indicated that whilst they thought that good ERA systems could have a positive effect on the quality and quantity of research undertaken, they explicitly mentioned the corollary that poor ERA systems could have negative effects. Many responses bemoaned the difficulty of disaggregating the perceived effect of ERA systems from RMA per se. Similarly many thought that ERA mainly helps by increasing speed and efficiency of RMA, but that indirectly this could affect the quality and quantity of research.

In terms of specific comments about how ERA might affect the quality and quantity of research amongst the 102 responses (question 19, see ERAQ04 for a fuller analysis) there were some interesting and insightful comments. Many were generally supportive of the research question: "*I firmly believe it can further affect quality*", "*Huge potential for electronic RA systems to improve both quality and quantity of research by facilitating all aspects of research management*", and "*It obviously enables an increase in research quantity:*

electronic costing, approval and management systems allow higher throughput of bids. It can also indirectly raise quality because it gives skilled research managers and administrators more time to target funding opportunities, comment on bids, and contribute to departmental research strategies, etc." with some providing evidence: "*Electronic researcch* [sic] *administration has had measurable improvement effects in both quality and quantity in my own institution, which has increased its research funding success rates by around 20% in the past year, partly as a result of a number of different aspects of RA carried out effectively, including online forms for internal permissions and costings as well as tracking and managing funding applications*". A few were less convinced "*I do not see how have electronic RMA has any further affect*" whilst others saw ERA as essential in certain areas "*Electronic RA is essential in some area e'g' costing and finacial* [sic] *management*".

A number of respondents saw the potential for ERA to free up the time of academic staff to do more research: "*Electronic research administration is one of the tools to do the job, not a panacea. Its main usefulness is in improving accuracy and throughput of stages such as costing and pricing, and monitoring finance in the post-award stages. It can also be very useful in streamlining the flow of proposals and projects through the various stages, with the minimum of errors, losses, ... and paper. This in itself can increase the quantity and quality of the research we do by simply giving academic/clinical researchers and everyone involved more time to do what they do best*".

Finally, perhaps the most widespread comment from the free text questions at the end was that in order to be effective and to realise the benefits of ERA systems, they must be "*informative, efficient and user friendly*" and meet the needs of all users (particularly RMAs and academic staff). This echoes the comments from the Green, McArdle et al. (2010) study into research information management, which goes further and also espouses data standards (Fowler, Green et al, 2011) and interoperability to facilitate inter-institution collaboration. Indeed a business case for the use of UK wide data standards (and in particular CERIF) has been made by Bolton (2010) in a report commissioned by JISC following on from the EXRI project (Rogers, Huxley et al, 2009) looking at research information data exchange; this is discussed in section 4.3.

6.3 UK HEI (Academic) Questionnaire

Together with a number of the respondents to the ARMA questionnaire, see Kerridge (2010d)/(ERAQ04), I posited that it would be enlightening to ask the academic staff as well as RMAs their views on ERA services and their potential effect on quality and quantity of research (see section 5.8.3). As the UK HEI questionnaire is materially different from the ARMA questionnaire used in section 6.2 as well as inviting academic staff to undertake this new UK HEI questionnaire (ERAQ02), RMAs were also invited in order to be able to compare the responses of the two groups.

The UK HEI questionnaire was developed over the latter part of 2010 and launched on Dec 4th, by asking ARMA members to complete the questionnaire themselves and also to pass the request on to academic staff. However by 27th Dec only 146 responses had been submitted. So further reminders were sent to administrators and the survey was left open during Jan 2011, closing on Feb 6th with 191 responses in total. This somewhat poor showing can perhaps be attributed to ERA questionnaire fatigue; however the analysis has still revealed some interesting findings (Kerridge 2011a)/(ERAQ06) which are summarised in (ERAQ07) and available on-line.

Overall the results were broadly in line with those from the ARMA questionnaire, with overwhelming support for the proposition that ERA can positively affect both the quality and quantity of research undertaken, with more respondents perceiving a positive effect on quantity than for a positive effect on quality. Even after potential bias in the questions and the scale ordering (Friedman, Herskovitz et al, 1993) is accounted for the results are clearly positive.

In terms of the sub-areas; Peer Review, Costing and Pricing and Proposal Submission were highly rated for their potential positive effect on the quality of research. Interestingly, Peer Review appears high in the list of sub-areas, see Kerridge (2011a)/(ERAQ06) when ordered by the volume of “increase” responses, much as reported from the workshop exercise in section 6.1, but contrary to the findings of the ARMA survey in section 6.2; this warrants some further investigation. It seems likely however that the ARMA survey findings for

peer review were skewed by the fact that peer review and ethical review were coupled into a single sub-area; ethical review on its own had a low to middling ranking in the UK HEI survey.

In terms of perceptions to positively affecting the quantity of research, ERA for Funding Opportunities joins Costing and Pricing and Proposal Submission with most “increase” responses at the expense of Peer Review. After accounting for the differences in the granularity of the definition of the sub-areas this is again in line with the findings from the ARMA questionnaire.

Whilst this repeatability of the results provides more evidence for the robustness of the two surveys, the aim of the second survey was in fact to determine whether or not there is a difference in the perceptions of academic staff to ERA as compared to the perceptions of RMAs.

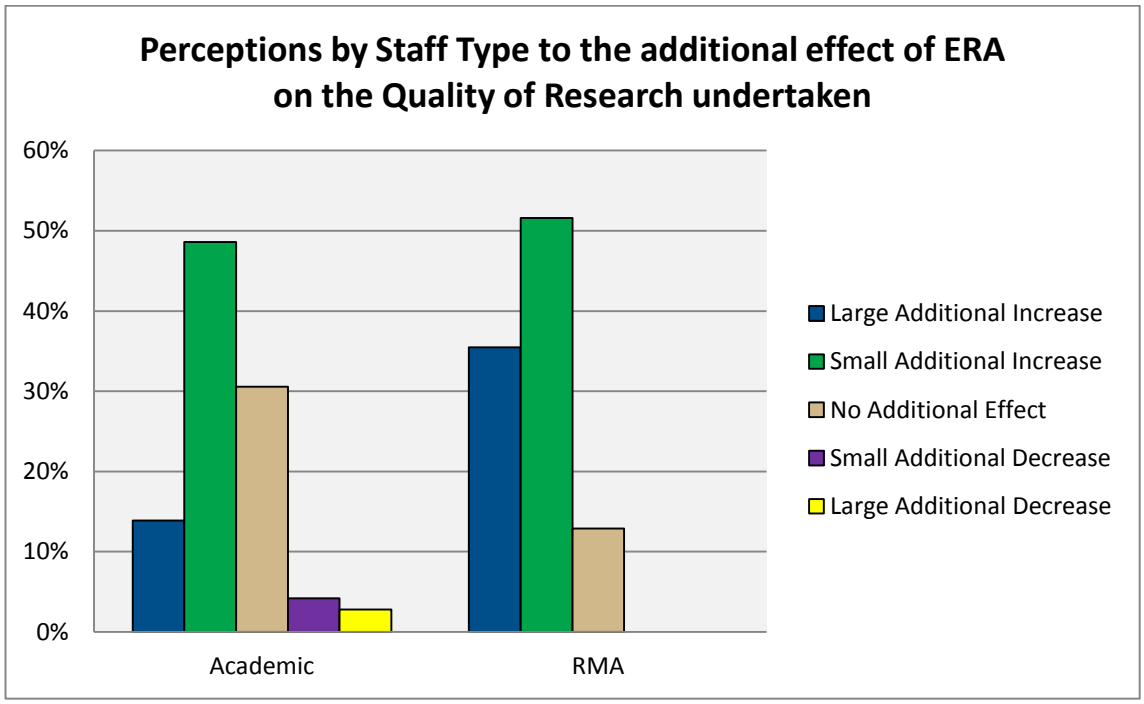

Figure 9: Comparison of the responses of academic staff and RMAs to their perception of the effect of ERA on research quality

The chart above clearly shows that academic members of staff believe that ERA can positively affect the quality of research, whereas RMAs are overwhelming positive, see Kerridge (2011a)/(ERAQ06) for the statistical justification.

The chart for the effect on quantity is even clearer (Kerridge 2011a)/(ERAQ06) than that for the effect on quality. Whilst academic members of staff are undoubtedly positive about the possible effects of ERA on research quantity the research managers and administrators are almost unanimously supportive.

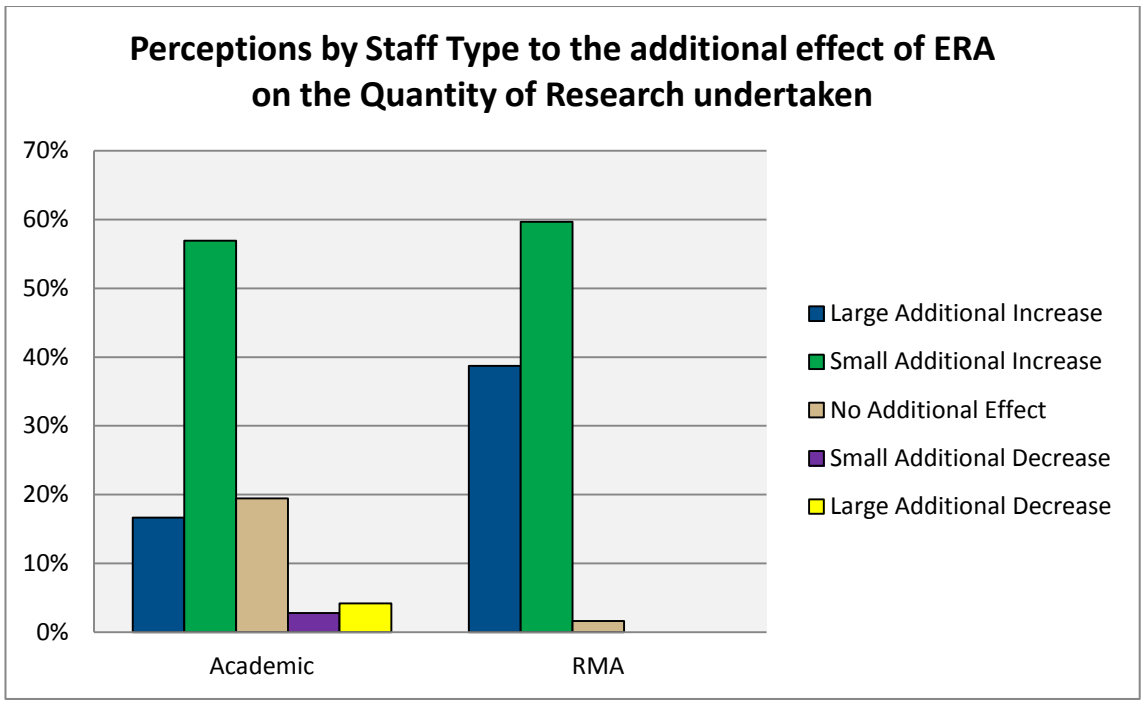

Figure 10: Comparison of the responses of academic staff and RMAs to their perception of the effect of ERA on research quantity

In general this pattern is reflected in the responses to the questions on the effect of specific sub-areas of ERA on quality and quantity: RMAs see the potential for a more positive effect than their academic colleagues and both perceive a greater effect on quantity than on quality, but not markedly so. This general pattern is seen across the 15 sub-areas (Academic Expertise, Funding Source Identification, Costing of proposals, Support for Generic Parts of Proposals, Internal Peer Review, Ethical Review, Risk Assessment, Proposal Submission Support, Contract Negotiation, Project Management of the Research, Financial Management of the Research, Output and Impact Recording, Research Planning / Strategy, Key Performance Indicators, and Benchmarking) identified in Table 1.

However there are a few outliers. ERA for Peer Review has already been mentioned and indeed both groups felt that it could positively affect quality more than quantity (as usual RMAs were more positive in both cases). This situation

was the same for the effect of Ethical Review, and also for Risk Assessment; it was deemed by both groups as more likely to positively affect quality rather than quantity. For Proposal Submission there was no statistical difference between the responses from both groups with respect to the effect on quality and quantity. For Project Management; academic staff did not perceive a difference, whereas RMAs looked more favourably on the effect on quality rather than quantity. It is the same for Financial Management of projects; no perceived difference from academic staff, but RMAs perceive a greater positive impact on quality rather than quantity. For Outputs and Impact reporting, both groups perceive no difference in the effect on quality as compared to the effect on quantity, and indeed the responses from the two groups are also in line. It is the same for the effect of Planning and Strategy, Key Performance Indicators, and for Benchmarking. It is felt that these last 3 areas can have a generally positive effect on both quality and quantity and that academic staff have the same view as RMAs.

In terms of qualitative feedback to the question 18 ("Do you have any comments about ELECTRONIC Research Administration in relation to how it can FURTHER affect the quality and/or quantity of research?", see ERAQ02) there were 15 substantive responses from academic staff, some were as positive as those from RMAs in the previous survey: "*ERA is of paramount importance to academic research*"; "*It would be useful to have access to electronic systems that would integrate all of the many aspects of research and administration*", and "*This has been very effective at my own institute as it is combined with support from knowledgable* [sic] *support staff*". There were however some warnings: "*It must support intelligent thought - not attempt to substitute for it*", and "*This sort of tool is only as good as the staff who use it, and most academic staff are unwilling or unable to use it effectively*".

These can perhaps be summed up in two further quotes from the responses: "*Electronic research administration has enormous potential but not if it is used as a tool to instantiate bureaucratic procedures*" and "*has to be totally intuitive*". And a final plea in support of RMAs "*Administration should not become impersonal. I like the idea that using computers may help administrators but not*

replace them". The potential for the benefit can be seen, but there are fears that ERA systems may drive processes rather than supporting them.

6.4 Questionnaire Conclusions

The intention of the Workshop survey (see section 6.1) was to determine if others thought that ERA systems might be able to affect the quality and quantity of research undertaken; and this was shown to be the case. Whilst the sample size was not large enough for robust statistical interrogation, the results were borne out by the analysis of the ARMA questionnaire responses (see section 6.2), which were in turn confirmed by the UK HEI survey (see section 6.3). Each of the three surveys reveals the same overall picture: Research Management and Administration is perceived to have a positive impact on the quality and quantity of research undertaken, and ERA systems are perceived to have a further positive effect.

When looking at the seven sub-areas in the ARMA questionnaire and the 15 sub-areas in the UK HEI questionnaire there were clear differences between some sub areas in terms of their perceived relative impact on the quality and quantity of research. Whilst developing a research management and administration capability, or an ERA system, in any area should prove beneficial there are some sub-areas that are thought to be more advantageous than others.

In terms of ERA for improving the quality of research the perception is that the top priorities should be Peer Review, Costing and Pricing and Proposal Submission. For increasing the quantity of research, the perception is that Funding Opportunities, and again Costing and Pricing and Proposal Submission systems should be the first areas looked at. As discussed, these findings may well be skewed by the fact that most of these areas have a number of ERA systems that support them; however this does at least mean that they are readily available.

In summary, the position is clear; RMAs see the value in their work in terms of supporting the research endeavour, even by what seem like indirect means.

Academic members of staff also see the value (but not always as much as RMAs themselves do) of research management and administration to research. In terms of Electronic Research Administration the results are the same: both groups perceive a potential positive impact on the quality and quantity of research undertaken; again with academic staff in general being a little less positive than RMAs.

Whilst it has been shown that both research managers and administrators and academic staff alike perceive that ERA systems in theory can have a positive effect on the quality and quantity of research, the practical situation in relation to specific systems could be somewhat different. The following two chapters present case studies of ERA systems that I developed at the University of Sunderland; Chapter 7 looks at costing and pricing and chapter 8 explores publication information. These case studies are reflected on and brought together, in Chapter 9, with the other strands of work in order to summarise my contributions and to suggest future directions.

7 Case Study 1: Costing and Pricing Tool

After a brief overview of costing and pricing (see section 7.1 below), a detailed summary of the systems used at the University of Sunderland is provided. I developed the GrAppl system (see section 7.2) that was used 1997-2005, then after the introduction of Full Economic Costing (fEC) in the UK it was upgraded to become the fECAF system (see section 7.3) which was used until it was superseded by the commercial pFACT system (see section 7.4) in 2010. These sections also provide the rationales for and the differences between the systems. Finally, the ways in which costing and pricing could affect the quality and quantity of research undertaken are outlined in section 7.5.

7.1 Costing and Pricing

When an academic researcher at a University wishes to undertake a research project they will often seek external funding to support their work. Most Universities, if not all, have a process for approving proposals before they are submitted to a proposed funder for consideration. Procedures vary from institution to institution, but most will include:

- an assessment of the quality of the proposed research (and the proposal);
- confirmation of availability of the proposed resources;
- ethical approval;
- risk assessment;
- intellectual property (IP) issues;
- the costs involved; and
- the price (amount to be requested from the funder)

Whilst the costing and pricing elements are undoubtedly essential parts of the approval, they are to some extent the least important, but do have the advantage of being quantifiable. If the proposal is of low quality then it is unlikely to be funded (this can be addressed, for example, by introducing

internal peer review checks prior to submission). If the required resources are not available to support the research then even if the funding is won the research could not be carried out (if for example lab space was not available, or if a key resource were being utilised by another project). Ethical approval can be, and sometimes is required to be, obtained after a project starts, however there might be overriding ethical considerations that would veto the project (for example, many UK Universities do not accept research funding from tobacco companies). Similarly a wider risk assessment (perhaps to do with lone working of a researcher in the field) might require changes to the proposal. There may also be issues to do with ownership of background and foreground IP, these considerations may inform the pricing strategy. If a proposal has been properly thought through and planned then the costing process can be quite simple (although determining individual costs elements can be complex, particularly staff costs). Conversely the costing process can highlight areas where costs have not been identified helping to feedback into a poorly developed proposal. The pricing may be determined by the funding source and programme for public funders, or can be a negotiation based on considerations such as intellectual property (IP) and expected outcomes (Hazlehurst, 2004)/(Prof15), (Berry, 2010), (Aldridge and Derrington, 2012). It is perhaps worth noting that I have been involved in the development (ARMA38), delivery (ARMA39) and, after the introduction of fEC (Alexander, 2009), the substantial updating (ARMA40) of a national course on costing and pricing. I was able to input into this course based on my experience of costing and pricing in general and specifically due to the development (GrAppl, and major updating to fECAF) of the ERA system for costing and pricing that I introduced at Sunderland, see sections 7.2 (GrAppl) and 7.3 (fECAF). I have also presented on fEC for AURIL (Prof23) and was interviewed by Abby Day Peters for her book on winning research funding (Day Peters, 2003).

It is clear that whilst costing and pricing can be described as a stand-alone process it must take into account a number of other factors (such as risk assessment, ethical review, peer review, proposal approval and resource availability) and hence many ERA systems integrate them into a single approval

process. This is the approach that I have taken at Sunderland and the following sections describe the successive ERA developments for costing and pricing.

The various developments of the research support systems at Sunderland are outlined in a poster (Kerridge 2010b)/(ERA22) with a narrative provided in (ERA05). A snapshot of the architecture is in (ERA03, see also Figure 1) and a sub-set of the entity relationships provided in (ERA04), with some simpler relationship diagrams in (ERA52, ERA53, ERA54, ERA55 and ERA56). But here we look in more depth at one element of the overall system: the on-line project proposal approval system that has costing and pricing as a core function. The original electronic costing and pricing system was developed in 1997 as an on-line equivalent of the existing paper based system GrAppl (Grant Application) form. The on-line system was run in parallel with the paper based system for eight years, and over time became the preferred method for academic staff as they could manage the staff calculations themselves using the on-line GrAppl.

7.2 GrAppl

When I started as a Research Development Officer in 1995, the University used the GrAppl [Grant Application] form or so-called 'white form' for the approval of submissions for research (and consultancy) projects.

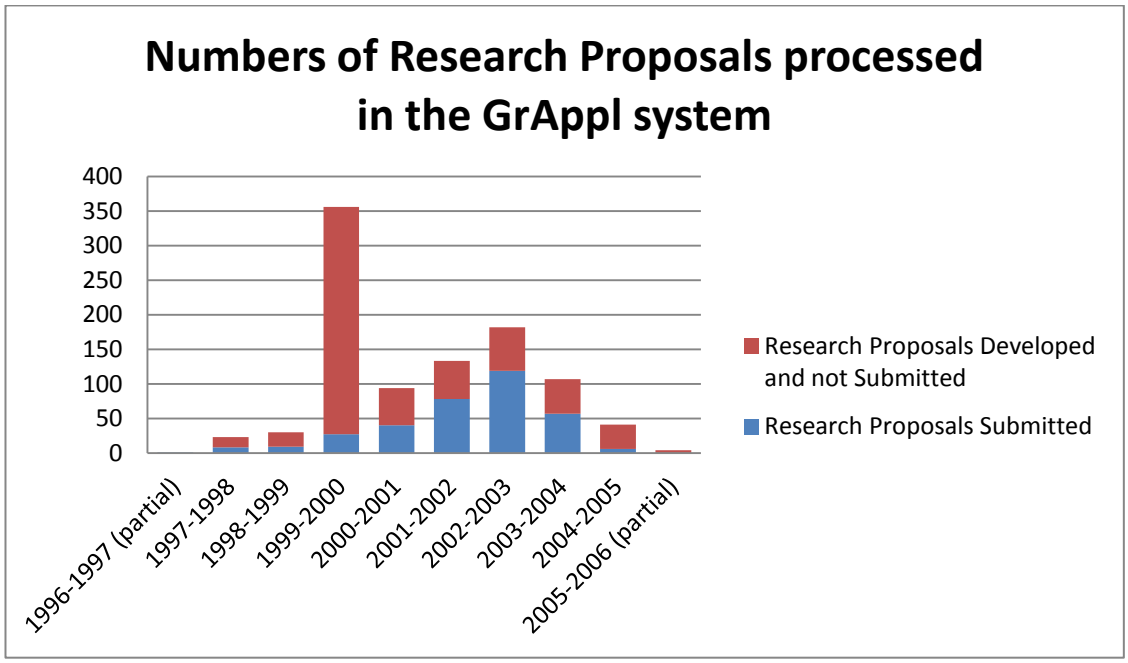

Figure 11: Numbers of Research Proposals processed in the GrAppl system by Academic Year

Of the various systems that were created in the early part of the GRSdB developments, see (ERA05), the on-line GrAppl form was perhaps the most complex. It was first introduced in 1997 and was used for over eight years until it was replaced by the fECAF system in 2005. The system was less comprehensive than the fECAF that was to follow, but is interesting for a number of reasons. Firstly it was not mandatory to use the system, so we cannot for example use the data as a proxy for research proposals and hence research activity, but we can see from the usage graph that the system was little used in the first few years.

In the Academic Year 1999-2000 there was a concerted training programme and we can see a much higher proportion than normal of costings developed in the system but never submitted for approval (red); these are 'test' proposals used in training. Note that there was not a separate training or test system, so training was undertaken using the live system; not an ideal situation. Following that year we can see a steady increase in the usage of the system until 2003-4 which closely maps the future research income profile of the University. In 2003-4 and 2004-5 the GrAppl system usage fell and in Dec 2005 it was replaced by the fECAF system. The reasons for the decline in research proposals (and income) are many faceted and not discussed here.

There are of course countless other statistics that can be derived, for example of the 2,025 proposals only 946 were submitted; the remainder mainly being test proposals. Of those submitted there were 268 different principal investigators (PIs) with 111 only having one proposal over the eight year period; one person had 38 proposals and another 19 had ten or more proposals. Figure 12 shows graphically that the majority of academic staff only submitted one or two proposals over the period using the system. Figure 13 clearly shows that most proposals were for between £1,000 and £100,000 with roughly equal proportions above and below £10,000.

Co-incidentally the proposals were to 268 distinct funding bodies; grouping these into funding types we can see in Figure 14 that the highest proportion of proposals were to UK Government sources, whereas the highest cumulative value of proposals were to Research Councils.

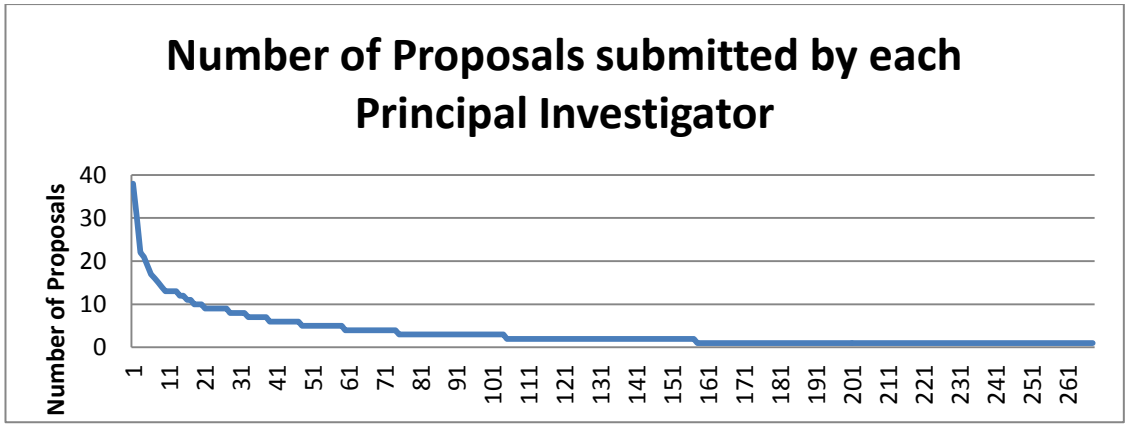

Figure 12: Numbers of Proposals submitted by Principal Investigators during the GrAppl (1997-2005) period

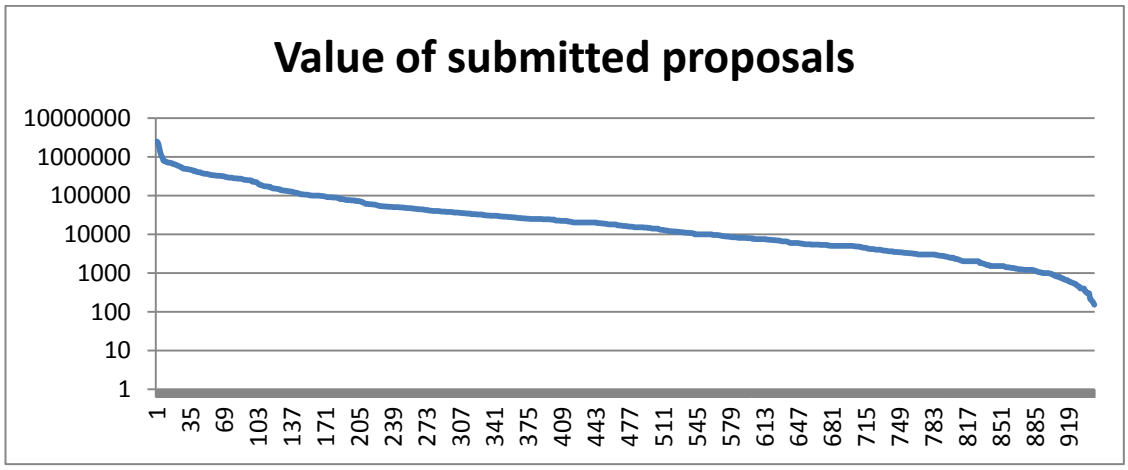

Figure 13: Value (£ sterling on a logarithmic scale) of proposals submitted using the GrAppl system (1997-2005)

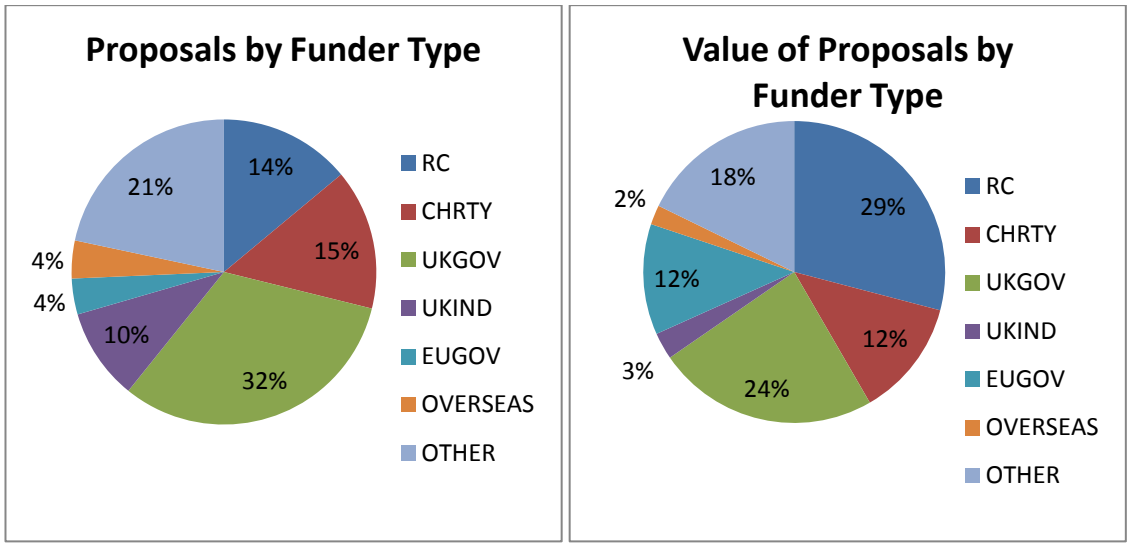

Figure 14: Number of (left) and values of (right) proposals on the GrAppl system (1997-2005) to Funder Types

These graphs give an indication of the management information that is available from the costing and pricing area of the GRSdB, and indeed the database as a whole. They are however included here in order to demonstrate the scale of the usage of the GrAppl system; further examples can be found in (ERA42).

7.3 fECAF

In 2005 full economic costing (fEC) (JCPSG, 2005) was introduced in the UK as a mandatory method (JM Consulting, 2005) for HEIs to calculate the cost (and price) of research proposals. Given the high usage of the electronic system (estimated at more than 80%) over the paper based system, it was decided that the revised system to meet the needs of fEC need only be on-line. And so the full economic costing approval system (fECAF) was developed and from Jan 2006 only on-line approvals have been accepted.

One major change with fEC was the method of estimation used for determining overheads. Prior to 2005 Universities used a flat rate (latterly 46) percentage of staff costs; under fEC this became an amount per full time equivalent (FTE) of research staff time (and was split into an estates cost and an indirect cost). Crucially the new methodology attempts to calculate the full cost, with the price being charged to the sponsor often being less, but in the knowledge that the University is funding the shortfall through the dual support system (OST, 2003). A UK wide review of fEC by Alexander (2009) provides an excellent summary of the issues involved and the context of these developments are also discussed more briefly by Mills (2006).

Whilst the on-line GrAppl system had provided enhanced functionality for a costing process that was well understood by staff, the fECAF system utilised the new fEC methodology. It also introduced a risk assessment section and allowed for a more flexible approval process. Initially the system met its requirements well, but the underlying costing calculations were more or less opaque (a design decision in an attempt to hide complexity, but in actuality this led to a mistrust of the figures (FG02)). The database structure and relationships of the fECAF system can be found in the portfolio (ERA04).

An informal review after the first year confirmed that the system was operating well but that there were some usability issues. Often there was confusion with staff using the fECAF system not understanding the new methodology and hence mistrusting the calculations. There were also complaints about the speed (responsiveness) of the system and the lack of comprehensive help. As described in Kerridge (2010)/(ERA05) and summarised in (ERA03) there were various institutional reorganisations and the system was extended to better deal with non research proposals, however the appropriate resource for maintaining the system was not secured. Additionally, the UK wide fEC regime was being refined, requiring updates to fEC costing systems. By 2008 it had become clear the system either needed a major update or should be replaced, at this point there were a number of commercial systems available and a decision was made to replace fECAF with pFACT (see section 7.4).

However the fECAF system was operational for 5 years (pFACT was not rolled out until 2010) and over that time it was generally used as intended. 946 proposals (of which 606 were research proposals) have been through the system with a further 1079 (of which 456 research) developed but never submitted (many of these being test proposals). The value of these submitted proposals was £73.437M (of which £59.625M was research).

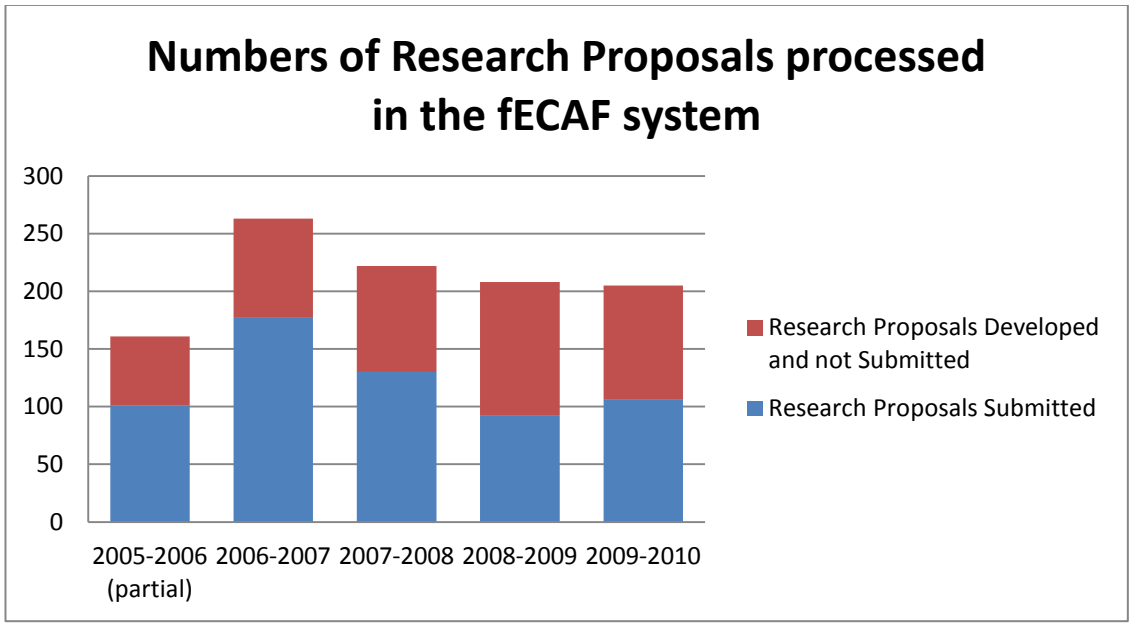

Figure 15: Numbers of Research Proposals processed in the fECAF system by Academic Year

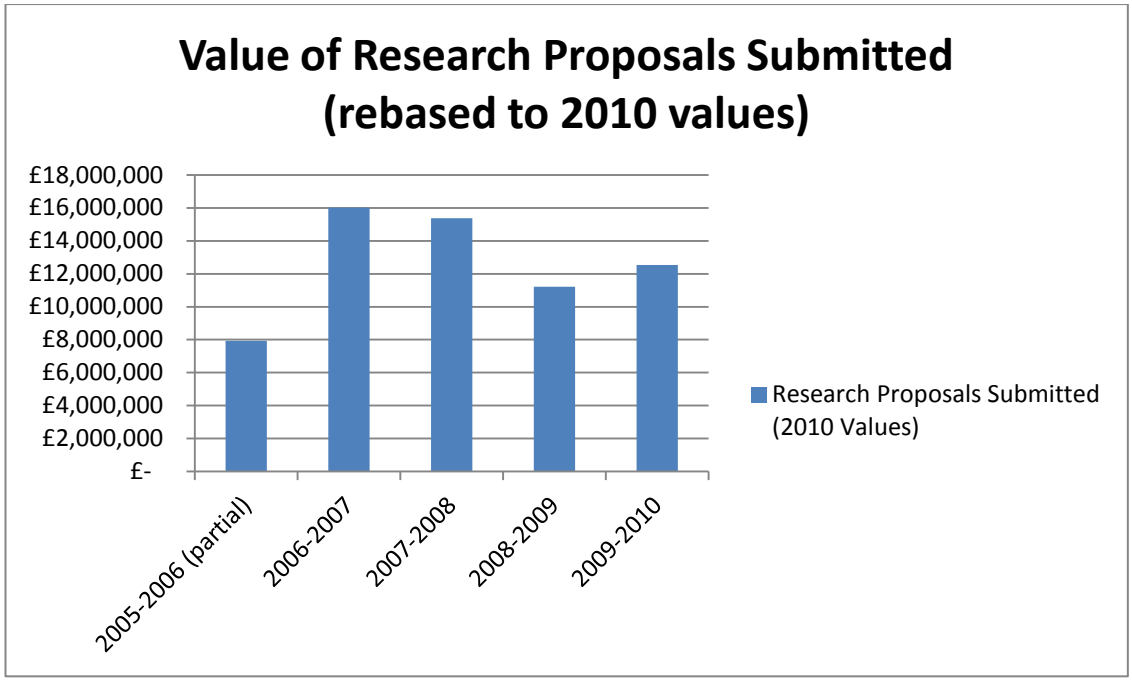

Figure 16: Values (rebased to 2010 values) of Research Proposals submitted through fECAF by Academic Year

Note that the figures for Academic Year 2005-6 are only for the eight month period from Dec 2005 when the fECAF system went live. These graphs clearly reflect the decline in the research activity at Sunderland over the period; with a slight indication of recovery during the 2009-10 Academic Year. This can be traced to many factors and is not attributable to the use of the fECAF system; however the data from the system has provided clear management information.

Just prior to the introduction of pFACT I ran some focus groups (FG02) to reflect on the good, the bad and the ugly of fECAF in order that lessons might be learnt for the introduction of pFACT, see section 5.7.1.

7.4 pFACT

The pFACT system was procured by the Projects Finance team in 2008 and they managed the implementation and roll out of the system; it was launched on Aug 2nd 2010. My role in this was in an advisory capacity as the university costing and pricing expert (particularly for research) and for my extensive experience of introducing Electronic Research Administration systems. This less hands-on role has allowed me to be much more objective in my reflections on the new system.

It should be noted that notwithstanding the elapsed time taken to implement the system the amount of effort was actually spread over a fairly short period and in the end was in fact a little rushed. However the go live date of the beginning of the academic year meant that teething issues could be addressed in the relatively quiet period of August and that Key Performance Indicator (KPI) data for the whole academic year would be available.

At the time of writing, pFACT has been fully operational for a little more than a year and as for fECAF, the system is mandatory so usage statistics would just reflect activity. In order to try and gauge the effectiveness of pFACT as compared to fECAF I constructed the Sunderland questionnaire based on some focus group work, see section 5.7.1 and (FG01). I (amongst other things) asked research active staff and research administrators to reflect on the effectiveness of fECAF and pFACT as compared to other methods of costing. The summary report and recommendations to the University's Business Systems Strategy Group can be found in (FG03).

The Sunderland survey elicited [n=155] responses from a possible 486 (31.9%), which means that some statistically significant results can be drawn.

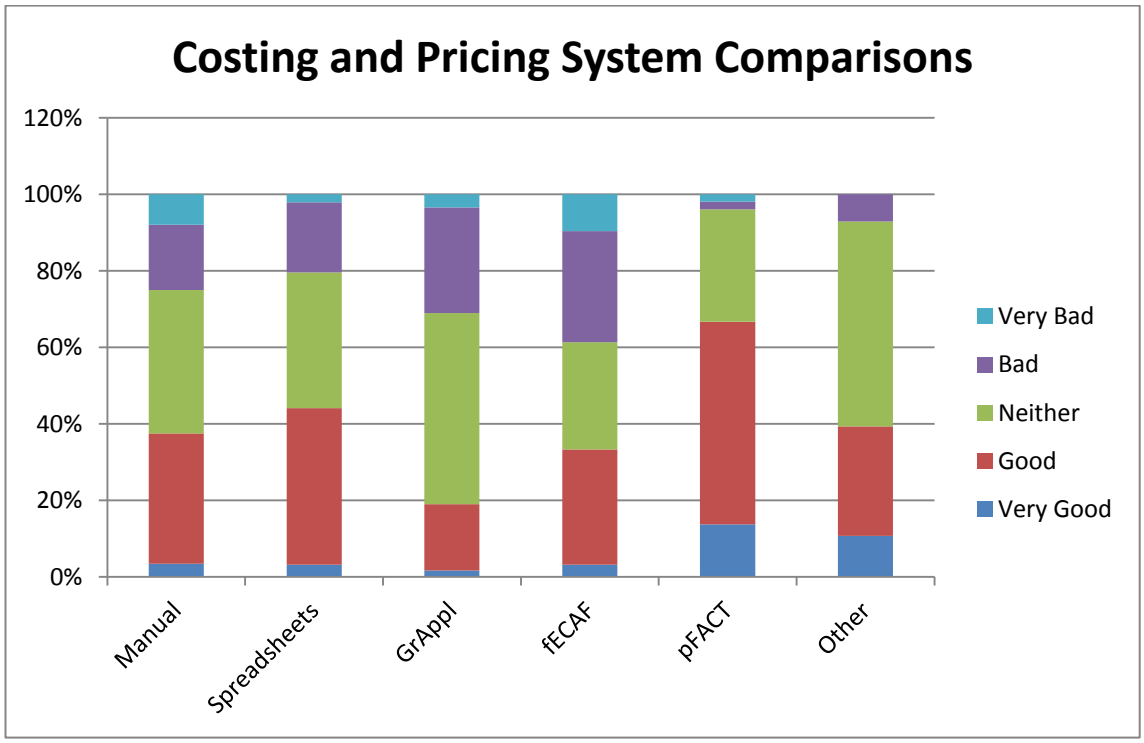

Figure 17: Comparison of overall perceptions to different Costing and Pricing Systems

It can clearly be seen that pFACT has made a good early impression, with an excellent overall position of 67% positive and only 4% negative responses. This extremely low negative feedback is a good sign and needs to be maintained; there are lessons to be learnt from the decline in the maintenance effort afforded to the GrAppl and particularly fECAF systems.

The news is not all rosy for the new system though, some of the textual feedback bemoaned the extended approval process (more people are required to authorise proposals) and others complained about the steep learning curve for a new and unfamiliar piece of software that they would only use occasionally.

7.5 Conclusions

Costing and Pricing is an area of RMA that is almost ubiquitously supported by ERA of some sort. The developments that I engineered at Sunderland were, initially, cutting edge with the on-line GrAppl form in 1997, and still ahead of the curve with the introduction of fECAF in 2005. However a few years later an affordable commercial system (pFACT) became available and it was decided to buy-in rather than maintain our own ten year old system.

In chapter 6 the analysis of the ERA survey responses is discussed. In terms of Costing and Pricing and the effect on quality and/or quantity of research, the results of the ARMA ERA survey (ERAQ04) are clear. They show that most (79.2% of n=621) research managers administrators believe that Costing and Pricing can positively affect the quality of research undertaken; this is the highest proportion for any of the seven areas of research management and administration asked about. In terms of the effect on quantity of research undertaken 74.8% (the second highest proportion) agreed that a positive impact could be expected.

However looking at the analysis of the responses to the Sunderland questionnaire (FG03) (derived from the focus group work) carried out at Sunderland with mainly academic respondents which asked them specifically about fECAF rather than Costing and Pricing in general, the position is much

less clear. Of the [n=86] respondents who had an opinion only 15.1% indicated that they thought that fECAF had had a positive effect on the quality of their research; and indeed 33.7% indicated a negative effect. However 51.1% of [n=88] indicated that they thought that fECAF was better than using just spreadsheets and so this probably reflects the view of academic staff to costing and pricing per se rather than of ERA; that is, they would prefer not to have to do it at all. It is a similar picture with respect to effect on quantity [n=85]; only 11.8% indicated a positive effect and 41.2% were negative. Analysis of the textual responses shows that the system was seen by some as being so impenetrable that it put them off applying for funding at all! This overall impression is to some extent reflected in the responses from research managers and administrators: only 33.3% [n=12] and 23.1% [n=13] were positive for quality and quantity respectively.

However, when comparing these Sunderland results with the results of the UK HEI survey, including academic staff respondents (see section 6.3 and (Kerridge 2011a)/(ERAQ06)), a different picture is painted. Of the [n=72] academic staff who expressed an opinion as to the potential effect that ERA costing and pricing systems can have on the quality of research, 79.2% were positive. For RMAs 88.5% of the [n=61] were positive. The responses are similar for the effect on quantity of research: 72.6% of the [n=73] academic staff members were positive and 86.9% of the [n=61] RMAs were positive.

These results reflect those from the ARMA survey, but leave the results from the Sunderland survey needing to be explained. Analysis of the wording reveals that the two surveys with a high rate of positive responses ask about costing and pricing in general, whereas the far less positive Sunderland survey asks specifically about the fECAF system rather than costing and pricing in general. There is no reason to assume that staff at Sunderland are more negative to ERA systems in general than the UK average, it appears that the fECAF system itself is not an exemplar costing and pricing system. This is borne out by the textual comments from the focus group survey and the focus groups themselves, the low usability of systems caused frustrations and an overall negative impression *"Very steep learning curve for something many academics would use only rarely."*; *"frankly the system is impenetrable - and i*

never did find out how costs were arrived at". Clearly the fECAF was due for a complete overhaul or replacement. The information from the Sunderland survey has fed into the development of the pFACT system. It would be instructive to compare those results with a future survey of the use of pFACT.

Table 4: Potential reasons for positive and negative effects of Costing and Pricing systems on Quality and Quantity of Research

ERA C&P	Negative	Positive
Quality	The system assumes / promotes external funding, and so could deter staff from undertaking own funded research.	Use of the system could inform the overall project plan and potentially increase the quality of research undertaken. Having the correct funding can ensure that the project can progress as planned.
Quantity	An unfriendly system can be a barrier to submitting. If inflexible/lengthy process then proposal submission deadlines could be missed.	Easy to use system could help proposal development. System could ensure that correct / optimal funds are applied for (increases chances of funding and amount of funding)

Finally, in terms of the effect on quality and quantity of research, the focus groups noted some reasons for possible positive and negative effects (see Table 4 above).

These positive reasons are in line with those that I postulated in the 2009 ARMA poster (Kerridge 2009a)/(ERA23), giving weight to those ideas. Initially I had not considered negative effects although some are clearly indicated. One major difference from my original ideas is the relative magnitude of the effect on quality as compared to the effect on quantity. I had suggested that the latter would be somewhat higher than the former, but the majority view is that the perceived levels of effect are similar (see chapter 6).

Clearly ease of use is a real issue for costing and pricing systems. Due to the nature of the calculations that are required, they are inherently complex and anything that can be done to make them more user-friendly is a step in the right direction.

8 Case Study 2: Institutional Repository

The role of institutional repositories in Universities is discussed and then a pre-cursor system (the Publications section of the GRSdB) is outlined in section 8.2. The full digital repository (SURE) is then discussed in section 8.3 and the potential effects on quality and quantity of research are elucidated in section 8.4 drawing on the responses from the various surveys described in chapters 5 and 6.

8.1 Publication Information

Publications, and more generally, research outputs are extremely important to all Universities. In the UK this has not only a subjective impact but can be quantified in monetary terms. The results of the most recent national research assessment exercise, the 2008 RAE (HEFCE, 2008) is used to distribute 'quality related' or QR funding allocations for the University financial years of 2009/10 to 2014/15 as part of the dual support system. In England alone the mainstream QR amounts to just over a billion pounds a year, with the funding being allocated on the basis of the quality and size of submissions. Although there is a variance by subject area, overall the publication record accounted for around 70% of the final grade profile. Hence over the six year period, the (up to four best) publications (from the previous six years) from English Universities were worth over four billion pounds. There were 215,655 research outputs submitted (approximately 175,000 from English HEIs). The HEFCE (England) QR funding for 2009/10 was £1,130M, so on average each publication was worth around £5,250 a year, or £31,500 over the six year funding period. There is of course a variation depending on the quality, with lower rated research outputs not attracting any QR at all, and some of the highest rated outputs in some subject areas being worth over £130,000 over the six year funding period. For a detailed description of the funding methodology see Waller (2010), but the important fact in this context is that high quality research outputs are worth substantial sums of money to Universities. Scoble (2002) argues (from an analysis of the previous RAE, but the arguments hold for the 2008 RAE) that

the number of outputs expected per member of staff (4) affects the publication behaviour of researchers (Bekhradnia, 2009). Scoble (2002) also notes a possible negative effect on the morale of researchers if they are short of the requisite four outputs near the end of the assessment period.

More advanced analysis of publication authorship and citation is available from commercial suppliers, such as InCites[24] from Thomson Reuters, SciVal[25] Strata from Elsevier and Publications[26] Elements from Symplectic, and can reveal perhaps previously unknown synergies between groups of researchers. This can be useful for identifying potential future research collaborators.

However, before any analysis can be undertaken, it is important for both planning and morale that accurate and up-to-date information about research outputs is recorded. Clearly, publications themselves can be extremely valuable and so it is worth spending effort in ensuring that information about research outputs is accurate and up to date.

Publications that are more accessible are more likely to be read and hence more likely to be cited, see Antelman (2004) and Norris (2008), raising the profile of the authors and their institution. Information on publications is one step towards this aim; the next step is making the full text of the publication itself also available. In the UK over the past ten years there has been much promotion (and in some cases mandating[27]) of, and debate (JISC, 2009) on, the benefits of open access publishing. Whilst it is not clear that open access publishing increases citations in all cases (Craig, Plume et al, 2007), it is the case that academic staff do perceive a benefit in having their research output freely available (Dallmeier-Tiessen, Darby et al, 2011).

A related area is that of Institutional Repositories, which as well as being able to store the full text of open access publications can for other publications (depending on copyright) have the full text of a pre-print, or the post-print available after a certain time lag. The area is however fraught with

[24] http://researchanalytics.thomsonreuters.com/incites/ (accessed 24th April 2011)
[25] http://www.info.scival.com/strata (accessed 24th April 2011)
[26] http://www.symplectic.co.uk/products/publications.html (accessed 24th April 2011)
[27] For example The Wellcome Trust, see (accessed 24th April 2011): http://www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Open-access/Policy/index.htm

complexities, see for example Guédon (2004) and Jeffery (2006), and it is important to have institutional support for self-archiving.

However, for some management situations full text is not required, reliable meta-data about the publications is all that is needed to be able to make informed decisions.

8.2 GRS Publications Database

At Sunderland, after the experience of the 1996 Research Assessment Exercise (RAE) submission where a number of publications were known about but the details could not be easily traced, it was decided by the Deputy Vice-Chancellor that a publication information database should be developed. The main driver was that the submission to the following RAE in 2000 should be more efficient and better managed. However the system also enabled much better ongoing management information and some key performance indicators (KPIs) were developed. It also supported the semi-automatic generation of annual research reports. More detail on the rationale and motivations for the system can be found in (ERA05) and in shorter form in Kerridge (2010c)/(ERA31) with a timeline shown in Kerridge (2010b)/(ERA22); the salient database structures can be found in (ERA04). The system has allowed me to easily generate reports, for example (ERA57), on request from the Deputy Vice-Chancellor chairing the Institutional Repository (SURE, see section 8.3) steering group.

In terms of the specific aim of the Publications section of the GRSdB; it was devised as a database of publication reference information rather than as a full text repository. It does however allow for a link to an on-line version of the output if such exists there are in fact 688 such links giving a virtual deposit rate of just over 7%. The system was designed to allow academic staff to enter their own publication information (or for research administrators to do so on their behalf). Once entered the information was included on internal reports and KPIs, however it would not be visible to the outside world (on the GRS website) until the details had been checked by a department or centre leader – at this time they could also give it an internal quality rating to aid in a future selection for the RAE. Whilst the entering of publication information was mandated it was

also aided by the internal promotions boards only using reference lists generated from the database.

The system itself was relatively simple to use (there were not the usability issues of the more complex fECAF system, see section 7.3), and by the time it was supplemented by the institutional repository (24th May 2011), see section 8.3 it had been in use for 15 years. However over that time there had only been a number of minor updates, mainly to store additional information required for subsequent RAEs – there were no major updates to the user interface. When the system was introduced in 1996 web technology was rather less sophisticated than in 2010, so the interface itself looks very dated and the additional functionality has not always been seamlessly integrated. As such the major concerns raised by the 2010 focus groups centred on functionality that was in fact available, it was just that casual users did not know that it was.

Notwithstanding the minor gripes about the system, it has been well used over the years and has been indispensible for two RAE submissions. A snapshot of data (24th August 2010) has been extracted to produce some statistics (see also ERA42), some of which are discussed below.

The Publications database holds information on 9,626 research outputs. Seven of these have no authors associated with them (this should of course not be possible). The majority (5,529) have one author and the mean is 1.90 authors per research output, with few publications having many authors; there are 43 with 10 or more and the highest number of authors is 26 for a conference paper on “OBK – An Online High Energy Physics’ Meta-Data Repository”.

There are 5,377 author records (of which 1,306 are or have been members of staff at the University). Of these 1,254 have no research outputs attached to them, and of the remaining 4,123 there are 2,220 with one output only. The mean number of research outputs per author is 3.49. There are many prolific authors, with 200 having 20 or more articles; 47 of these have 50 or more; and six have 100 or more articles to their name; the most for an author is 141.

Information on a total of 1,508 journals is held, although only 1,176 have any publications attached. There are eight journals with 20 or more publications,

the most popular being the *Journal of Criminal Law* (with 31 publications) and most of the other seven are pharmacy journals with the *British Educational Research Journal* coming in with 21 associated publications. The mean number of articles per journal is 1.67 and there are 720 journals with only one associated article in the database.

There are also 777 research seminars (from the year 2000 onwards) listed in the database.

As well as standard journal, conference and book research outputs it contains information on art work, exhibitions, performances, installations and other outputs (under a total of 50 different headings). This relatively large number of publication types allows for both fine grained and consolidated analysis by groups of publication types. This was an early design decision based on the knowledge that the publication types allowed for in previous RAEs had often changed.

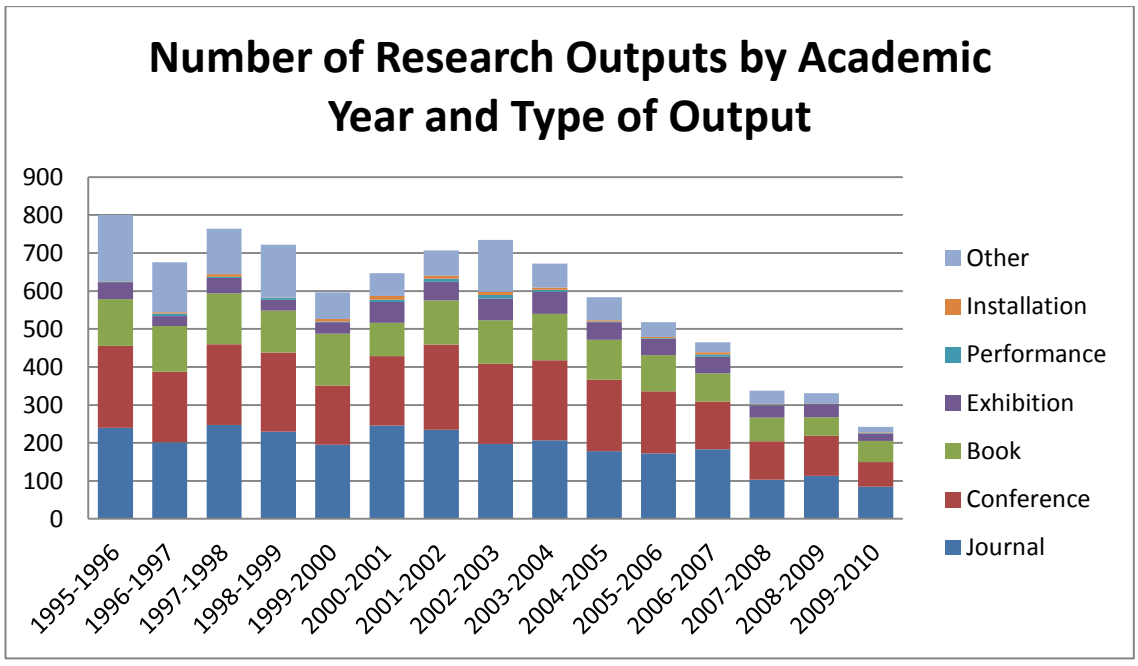

Figure 18: Types of Research Outputs on the database by Academic Year

Prior to the introduction of SURE I ran some focus groups (FG02) to reflect on the GRSdB Publications area in order that lessons might be learned in order to inform the introduction of the new institutional repository.

SURE went live on May 24th 2011 but was not fully operational until Dec 2011 and so there are no comparable usage statistics, but as with the GRSdB Publications area, the system is mandatory and so usage should reflect activity. In order to try and gauge the effectiveness of the Publications area I constructed a Sunderland questionnaire based on the focus group work (see section 5.7.1) and asked research active staff and research administrators to rate the effectiveness of different aspects of the system. The summary report and recommendations to the University's Business Systems Strategy Group can be found in (FG03).

The survey elicited [n=155] responses from a possible 486 (31.9%), which means that some statistically significant results can be drawn. Overall 36.1% of those that expressed an opinion [n=83] viewed the system more positively than just using IT tools (and 38.3% more negatively). In terms of the effect on research quality [n=84] 14.3% saw a positive impact but a further 14.3% saw a negative impact. For the effect on quantity of research [n=83] 14.5% were positive and 10.8% were negative. Again, it must be remembered that these responses relate specifically to the GRSdB Publications section rather than to research outputs recording in general. For a system that has not had a major overhaul in ten years this is perhaps not a bad showing; it seems likely that responses were skewed by particular aspects of the system that respondents found problematic.

8.3 SURE

In 2008, I proposed that the University should invest in an Open Access Repository. The reason for this was two-fold. Firstly, as a resource for showcasing University research outputs. Secondly, the initial proposals (HEFCE, 2007) for the forthcoming REF (the successor to the RAE) suggested citation levels as a proxy for publication quality[28], and many reports, see for example Craig, Plume et al. (2007), have indicated that freely available open access publications are cited more often than those with restricted access. It

[28] It transpires that the REF will not in fact use citation rates mechanistically as a proxy for quality, but some sub-panels will use citation data to inform their judgement

emerged that the University Library were also thinking about Open Access and so a Business Case was constructed for and approved by the University Business Systems Strategy Group. A tendering process was entered into and we selected and procured EPrints[29] in 2009. It was agreed that the Library would 'own' the system and they proceeded to specify and roll out the system; I sat on the steering group for the project. However, having learnt from the experience with the transition from fECAF to pFACT taking so long, I continued to provide support for the GRSdB Publications area. This was fortuitous, as EPrints, branded as SURE (SUnderland REpository), was also delayed and did not go live until May 2011 and data from 2008 onwards was not loaded into the system until Dec 2011.

The SURE archive was initially populated in 2010 with the nearly 800 research outputs that were submitted to RAE2008. These data were extracted from the RAE database (rather than the GRSdB) as ePrints already had an import facility constructed for that data format. It was agreed that for the go-live date of 24th May 2011 the existing meta-data from the Publications area of the GRSdB (from 2008 onwards) would be imported into SURE and the Library would source the full text as appropriate. Depending on resources the full text for outputs prior to 2008 would then be sourced in reverse chronological order to produce as complete an archive as possible. After the hand-over the GRSdB was set to read only and new entries were added through the SURE interface with the appropriate copyright checks for full text being undertaken on an on-going basis. As the reporting within the GRS system currently drives many institutional processes it continues to be used but will be phased out as the SURE reporting functionality is phased in. In order to continue using the GRS system for up to date reporting a periodic export of meta-data from SURE into the GRSdB will be employed. Whilst it might seem that two systems will be run in parallel; in actuality the SURE system will be used on a day to day basis by academic staff for lodging their research output and the GRS Publications area will utilise meta-data from SURE to providing reporting and what-if analyses for the central research office. It is hoped that this split of responsibility will enable

[29] See http://www.eprints.org/, accessed 30th April 2011

those best placed to undertake the support activities to do so; the library dealing with publications and the research office with management information.

It should also be noted that SURE is currently not well suited to handle local research outputs and so the Seminars area of the GRSdB will continue to be utilised.

8.4 Conclusions

In terms of lessons learnt, yet again there was a problem with the timescale of rolling out an externally sourced system. This was perhaps exacerbated by the system not being owned by the research support service and hence the imperative not being as high as it might have been.

However, it was certainly time to introduce a new system; the overall satisfaction levels for users of the GRSdB Publications area were quite low.

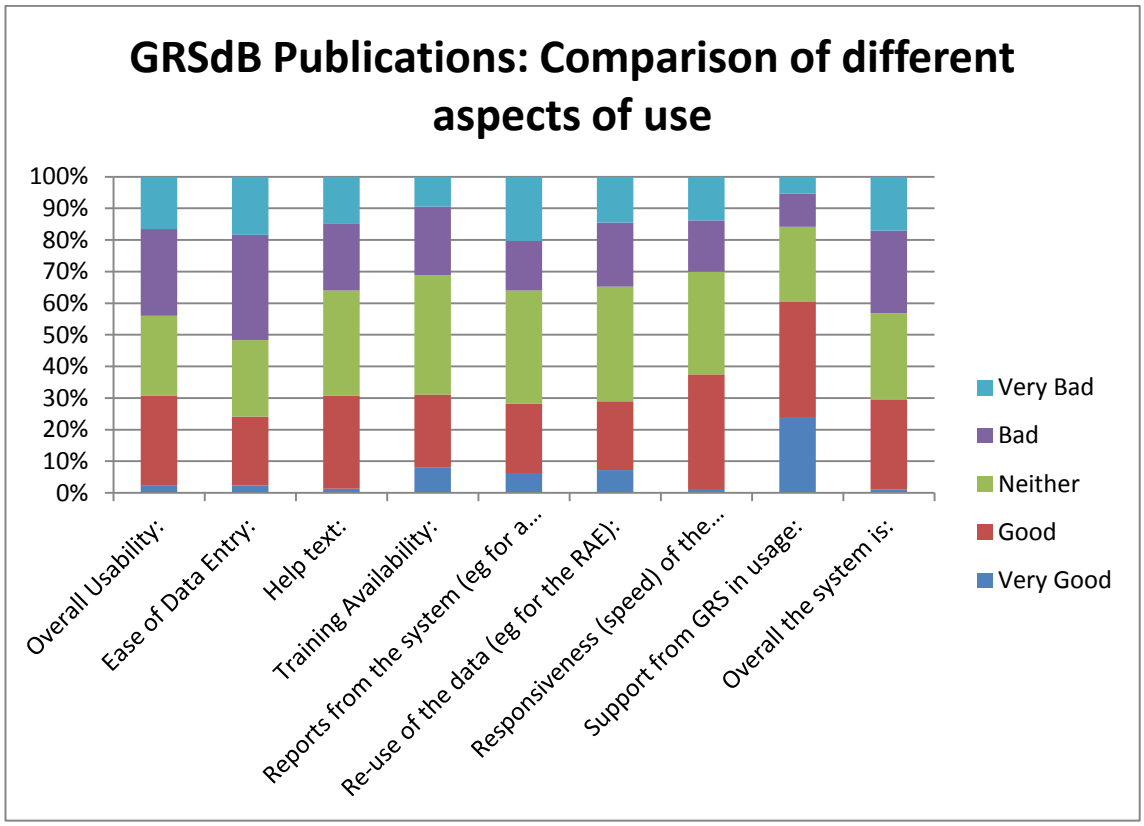

Figure 19: Questionnaire [n=144] responses to perceptions of different aspects of the GRSdB Publications area

Bearing in mind that these were the top areas that were voted for in the nominal group exercises as being specific issues it is not surprising that there are large negative responses. Even though the system has now been superseded by SURE and so cannot be directly used, it is hoped that this feedback will have correctly steered the project team to concentrate on the areas of importance to users. It also provides a benchmark for SURE to be compared against in the future.

Undoubtedly the GRSdB Publications area has been an invaluable tool for the University; it was used to populate the research outputs (RA2) form for the Research Assessment Exercises (RAEs) in both 2001 and 2008. Many HEIs recruit additional staff during the run up to RAE submissions to cope with all the checking and data preparation, this was not required at Sunderland.

However, the situation is not as rosy as it might seem; this efficiency in the run up to RAE submissions required that academic staff keep their publication data up to date on an ongoing basis. This is unquestionably useful for the University in terms of management information however the feedback from the focus groups (FG02) and subsequent Sunderland questionnaire (FG03) suggested that the process of updating publication information should be much easier. SURE should address this latter issue, and it is imperative that user feedback is elicited and a formal user satisfaction survey is undertaken to confirm improvement against the benchmark of the GRSdB system.

The GRSdB system is still be used for management reporting and what-if scenario planning for the forthcoming REF, however the data used for these purposes will have been collected through the SURE interface with the support of the library staff. In effect the Publications area of the GRSdB will revert to being a tool for the research office, which is what it was originally designed to be fifteen years ago.

In terms of affecting the quality and quantity of research undertaken there are some potential mechanisms that might support the perceptions shown in chapter 6. Having publication information easily accessible would perhaps mean that a particular researcher's field of expertise is more widely known and 'findable', particularly outside that field, perhaps promoting the opportunities for

interdisciplinary research. In the case of the free availability of the full text of research publications the citation rates have been shown to be higher (Antelman, 2004; Norris, 2008) and this adds weight to the previous argument. This increased visibility in the academic arena potentially means that a researcher that was not known before could be invited to participate in research projects that they would otherwise not have been, increasing the quantity of research and possibly the quality. Certainly this is not a strong argument and further evidence with have to be gathered to support (or refute) this hypothesis, however the case argued by Crow (2002, p.22) that institutional repositories lead to “enhance professional visibility” provides some support. Conversely the finding of (rather than the being found) a researcher with complementary skills could also increase quantity and perhaps quantity of research. It could be argued that this sort of searching or serendipity is a virtual analogy to networking activities that occur at research conferences.

9 Reflections and Conclusions

In this section I reflect on my contributions to the two main strands that comprise this work; Electronic Research Administration (ERA) and the development of the profession of Research Management and Administration (RMA) in the UK. Potential future work and directions are also outlined.

9.1 How I have developed

In terms of my personal development, I now take a much more evidence based approach to systems development and maintenance. I also ensure that I take the time to evaluate and reflect.

When I first started developing ERA systems, I did so with just one person in mind – me; after all I was the only user in the early days. However, when extending the systems to allow users to update their own information through a web interface, I was probably guilty of designing the systems to work in the way that I thought that they should work. In general this was OK for central users as I could easily envisage their mindset, but, there are many examples of assumptions that I made that simply did not hold true for departmental users. I (thought I) knew what was best for them and they should really do things in 'my way'. However, once the systems were developed there were opportunities to review usage, but in general these were not taken; there was always pressure to develop new areas and new functionality and indeed to do the day job of being a research manager and administrator; another manifestation of the issues of being a research practitioner.

In terms of career, I had thought that my somewhat eclectic background (own company, researcher, administrator) was a little out of the ordinary, but mapping it against the career stages presented by Cummings and Worley (2005, p.454-455) I see that I am more or less 'normal'. During the 'establishment' phase (ages 21-26) I ran my own company and was a researcher on a few different projects. 'Advancement' (ages 26-40) sees me becoming independent, first by leading research projects (and later being a principal investigator), then moving

into research management and administration and becoming truly autonomous, and in effect choosing a long-term career for myself. I am now in the 'maintenance' (ages 40-60) stage which is characterised by helping less experienced people to advance; although I would argue that I started helping others whilst I was myself still 'advancing'. So I have progressed through the first two stages and am now using the third stage of my career to help others in the profession of research management and administration and in particular those concerned with Electronic Research Administration. My outlook however is broader than that described by Cummings and Worley (2005, p.455) who restrict the help to 'less-experienced subordinates'; through the community of practice, (Wenger, 1998), that I have helped to grow through RAG*net* and ARMA I am able to contribute to the development of those in other organisations too, for example (ERA45), (Prof22), (ERA46), (ERA63), (ERA47), (Prof18, Prof19), as well as the many specific training courses and workshops that I have run.

9.2 My Contributions to the Profession

In terms of impact on the profession of Research Management and Administration, I have played a key part in the development of ARMA (and formerly RAG*net*) having served on the executive board for 12 years, see section 3.11. This has enabled me to contribute to the profession of research management and administration in general, see section 3.12; my ERA specific contributions are summarised in section 9.3 below.

Since I became a RAG*net* member in 1997 I have been involved in helping to develop the profession, and since being elected to the executive committee in 2000 I have contributed to over thirty committee / board meetings setting the direction for RAG*net*/ARMA as described in the Walcott (2011a) report that I commissioned. Over that period I have also contributed to many events, including all the conferences since 2001 (see for example ARMA46, ARMA19, ARMA20, ARMA35, ARMA36, ARMA21, ARMA47, ARMA22, ARMA23, ARMA29 and ARMA30), a number of training and expert seminar events (for example ARMA39, ARMA40, ARMA33, ARMA44, ARMA45, ARMA03, ARMA06 and ARMA05) always

taking the time to reflect on content, style and format (for example ERA39 and ARMA18).

I have also helped to raise the profile of ARMA and hence the profession of research management and administration in the UK by serving on various other national committees and groups (see for example Est01, Est02, Est14, Est16, Est18, Est22, Est23, Est24 and Est25). I have also operated at an international level (ARMA29, Prof02, Prof12 and Prof13).

At a regional level I was instrumental in setting up the NE-ARMA group which ran a very successful (Prof19) series of workshops (Prof18) for research administrators.

Perhaps the best indicator of the maturity of the profession in the UK is the work on producing a professional development framework (Garnett and Golightly, 2011), which I have advocated from the early stages (Prof02, Prof04 and Prof06) and been involved with in the planning and consultation phases (Prof24) and awareness raising (Prof21).

9.3 My contributions to Electronic Research Administration

I have detailed my practical ERA contributions in chapters 4, 7 and 8 and research contributions in chapter 6.

I found myself being a research manager and administrator with a background in computer science; it was a foregone conclusion that I would become involved in Electronic Research Administration. I developed (and latterly oversaw the development of) many interrelated systems at Sunderland over a 16 year period from 1996 (ERA05). Two areas are described in detail as case studies: costing and pricing (Chapter 7) and publications information (chapter 8). Many of these developments were cutting edge.

As a consequence I have built up expertise which has enabled me to help others, either directly or as part of user groups, for example: Manchester Metropolitan University (ERA63), Durham University (ERA46), Teesside University (ERA47), UKRO (ERA50), RAE (ERA65) and REF (ERA74). I have also served on

many steering groups for ERA initiatives: RCUK Je-S (ERA20, ERA21, ERA22) and JGP (ERA68); UKRDS (Est24), RMAS (Est12), RIM (Prof01) and BRUCE (Est25). I have also helped to raise awareness of the benefits of ERA through workshops and training events: RCUK Je-S regional events (ERA66 and ERA48), ARMA events (ERA40, ERA38 and ERA09), conference workshops (ERA18) and posters (ERA23, ERA21), and at INORMS (ERA22) and other events (ERA14, ERA29 and ERA70). I have also disseminated through the ARMA ERA special interest group (ERA49) that I champion and newsletters (ERA20, ERA35 and ERA36) and specific articles (ERA25 and ERA31). I have also reviewed proposals for ERA funding for JISC (Est11 and Est19).

Through my expertise and standing I have secured national external funding for four ERA projects at Sunderland: IRIOS (ERA51), IRIOS-2 (2012) and C4D (2012) with me as principal investigator and RMAS (ERA67) with me leading the Sunderland pathfinder element. These projects will enable me to further my research (and practical) interests in cutting edge ERA developments. However, on reflection, I should have been more aware of the international ERA arena when I started developing such systems in 1995 and should probably have adopted a data standard such as CERIF much earlier.

I have also undertaken research to substantiate the premise that ERA can affect the quality and quantity of research undertaken by addressing the research question "is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research" (see chapter 6 for details), discussed in section 9.4 below.

9.4 Is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research?

Firstly we must be clear that no evidence is provided that ERA does (or does not) affect the quality and quantity of research undertaken; only that individuals (RMAs and academic staff) believe that it can and that there are plausible mechanisms by which such effects might occur.

We have seen in chapter 4 that Electronic Research Administration can be defined as ***the use of IT system(s) designed specifically to support research management or administration*** and that it is an evolving area in the UK and around the world more generally. An overview of the systems that I developed in Sunderland is also provided. Two specific areas (costing and pricing; and publications information) and described in detail in chapters 7 and 8 respectively, giving indications that ERA systems might be able to affect research. This is underpinned by the work of DeLone and McLean (1992, 2003), Sedera and Gable (2004), Mirani and Lederer (1998), and Banker, Bardhan et al. (2006) who have shown that IT systems can affect the processes and products that they are designed to manage. In order to answer the question "is it perceived by RMAs and academic staff that ERA can affect the quality and quantity of research" undertaken, chapter 5 introduces the mixed methods research approach including surveys to assess perceptions to ERA systems, see chapter 6.

The results of the analysis of the responses to the ARMA and UK HEI questionnaires overwhelmingly indicate that:

- ERA is thought to be able to positively affect both the quality and quantity of research undertaken
- Different sub-areas were deemed to have different levels of perceived effect
- Academic staff, whilst still very positive, were a little less convinced by the potential benefits of ERA systems than their research manager and administrator colleagues
- In general the perceived effect on quality and quantity is roughly equivalent, but there are variations when looking at sub-areas.

The detailed analyses and conclusions can be found in Kerridge (2010d)/(ERAQ04) and Kerridge (2011a)/(ERAQ06); which also give recommendations on where to best focus effort depending on whether the desire is to increase the quality and/or the quantity of research. It is however worth reflecting from these that research management and administration per se was perceived to have a greater effect than ERA systems. This is good

news for the developing profession of research management and administration; expert RMAs are seen to have value by their academic colleagues.

Returning to ERA specifically, the findings discussed in chapter 6 in relation to the surveys are perhaps best summarised with some of the qualitative feedback in the open questions. One respondent from the ARMA survey thought that ERA "*can also affect research quality & quantity and directy* [sic] *and indirectly, although a direct impact on quality is the least common*" and whilst this reflects a majority view it needs to be balanced against a number of comments to the effect that "*Electronic Research Administration primarily helps the research administrators, but this in turn means they can more effciently* [sic] *help the academics/researchers, and, as above, thus play a part in improving the quality and quantity of research*". Certainly it seems that RMAs do perceive the value of ERA in (potentially, if the ERA system is a good one) improving the quality and quantity of research. But they also recognise that perhaps the most effective way to achieve these goals is to provide more research time for researchers by reducing the administrative burden on them, and ERA systems can achieve this. Of the responses from the UK HEI Questionnaire, one from an academic member of staff "*ERA is of paramount importance to academic research*" provides support for the research question without providing specifics in terms of increasing research quality and quantity; the possible mechanics for such increases would be a fruitful avenue for further work.

It should be noted that these findings are based on perception questionnaires and focus group work with reflections on the systems at Sunderland. When asking about the actual impact that the Sunderland ERA system had had, the results were much less favourable. Whilst people could see the potential benefits, they are not currently, at least at Sunderland, being realised (see sections 7.5 and 8.2).

9.5 Future work

When I originally outlined my work plan I had intended to leave a survey of academic staff perceptions to Electronic Research Administration (ERA) as

something to do in the future. However it soon became clear that this was to be core to answering the question at the heart of the work. Whilst Research Managers and Administrators (RMAs) can say whether or not they believe that ERA can affect the quality and quantity of research, without some experiment (see section 5.2) to measure an effect this is difficult to substantiate. So, asking academic staff, perhaps a somewhat more objective group (given that RMAs tend to 'own' ERA systems), whether they think that ERA can have an effect was the next logical step and adds weight to the argument. A rich avenue for further work would be to conduct a series of interviews with RMAs and academic staff in order to attempt to determine more directly the reasons for their views on ERA systems.

Some potential reasons have been posited for ERA systems in costing and pricing and in publication information (see section 7.5 and 8.4 respectively); testing these hypotheses would be a natural next step for research in this area.

Another method of data collection would be to expand the approach used by the University of Southampton (verbal reference: post-hoc asking whether the central research office had had a positive effect) by asking about the effect that ERA systems have had on proposals on a case by case basis. Perhaps also the institutional comparative approach of Gibson (2011) could be utilised more robustly if the numerous other variables could be accounted for. These approaches could provide data to support the conjecture that ERA can increase the quantity of research. It might also be possible to extend these approaches to include the possible effect of ERA systems on the quality of research, which for the latter might include analysis of the results of a series of national research assessment exercises (RAEs and REFs).

9.6 The future of ERA?

In terms of ERA, with the RMAS project there is a real opportunity to specify and develop a set of standard ERA tools to make an integrated suite of functionality that HEIs can pick and choose from (ERA71)/(RMAS, 2011). In the future, increased collaboration on research will demand interoperability between ERA systems and the recent adoption of CERIF as a UK wide standard for

research information exchange (ERA34) should be an enabler although take-up is still modest (Russell, 2012). However, CERIF only provides a data standard, in order to freely exchange data the semantics must also be shared and a solution such as that espoused by CASRAI (2012) is needed. Another crucial factor will be the development of authority lists to uniquely (with disambiguation and de-duplication) identify elements of data; this is needed to underpin the use of CERIF such that information from disparate sources can be properly linked. A 2011 JISC initiative (Est23), that I proposed, is looking at the area of researcher identifiers with a remit of determining where JISC might best focus their effort in this regard. This work cannot of course be limited to the UK; for an identifier system to realise its full potential it needs to be adopted universally – a non-trivial undertaking. Some options are discussed in section 4.3, but perhaps an open initiative such as ORCID (Fenner, 2011) might gain traction.

In terms of the potential effects of ERA systems on the quality and quantity of research undertaken, some possible approaches to addressing this question are outlined in section 9.5.

9.7 The future of RMA as a profession

Taking up the suggestion of Green and Langley (2009), the work of ARMA in developing a professional development framework for research management and administration (Garnett and Golightly, 2011) should be a fruitful area. Now that the framework is in place accreditation is possible and perhaps, given the development of the Institute of Knowledge Transfer in a parallel field, likely. However the development of certification in itself does not move a profession forward, as Roberts (2005) reports from North America, the certification needs to be valued by the profession itself before it becomes a driver for change. However, the development of ARMA over the last 20 years, see Walcott (2011b), has provided an excellent platform for the profession of research management and administration in the UK to move forward and be recognised outside the HEI sector.

9.8 Final Reflections

Over the past 17 years as a research manager and administrator I have seen many changes. What was once a job is now a career option. Electronic Research Administration has evolved from spreadsheets and static web pages to dynamic database driven web sites, with the promise of fully integrated cradle-to-grave systems that can interoperate with systems from other HEIs and indeed other institutions involved in the research agenda.

On a personal note, I have developed from being a computer scientist into a research manager and administrator supporting others. I have brought my technical skills to bear to the benefit of my University and the sector as a whole. I have further developed by taking the wider view; some of my earlier attempts at ERA met my needs but not those of others in the complex workplace that is a university. I am now a reflective practitioner always looking to learn from the experience of others as well as my own successes and failures.

Whilst I ensure that I do take the time to reflect on projects and initiatives as they are developing and after they have delivered, this is always a strain on time. I probably still take on too many things, but I fear that that will never change, but it will all be OK on that elusive tomorrow when I have some free time to reflect on my reflective practice.

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11 Portfolio Explanation and Matrix

The following is an index of portfolio items together with a short explanation of their relevance and the doctoral learning outcome(s) that they address. It is the equivalent of an annotated reference section, as such the items themselves are not included; they are to be found in the separate portfolio volume, although many are also available in the public domain.

The items have been gathered into seven broad areas in order to give the portfolio some structure, however there are a number of items that span a few areas and to a certain extent their inclusion in one rather than another is arbitrary. Each item is included only once to avoid repetition.

Note that the numbering is not contiguous as the items presented as evidence have been selected from a larger possible portfolio of items. So for example, item ARMA04 is a one page summary of ARMA's activities, but it was felt that this was not needed as evidence because it has been superseded by another item, the presentation on ARMA (Prof10) that I developed. Hence ARMA04 does not appear in the list below and is not referenced anywhere within this report.

Portfolio items are grouped into these seven areas:

- ARMA (ARMA)
- Electronic Research Administration (ERA)
- ERA Questionnaire (ERAQ)
- Esteem (Est)
- Focus Group (FG)
- Historical Items (Hist)
- Profession (Prof)

Each group of items is presented in a table, with two rows of information. The first row of the pair has the portfolio reference, type of document, short description and learning outcome(s) claimed. The second row describes the

context and importance of the item, in order to substantiate the claim towards the learning outcomes listed in the first row.

The learning outcomes (knowledge and skills) required for the professional doctorate are:

K1 Deep understanding of the recent developments in their profession nationally and internationally

K2 Deep understanding of current theoretical frameworks and approaches which have direct relevance to their own professional context

S1 Make a significant contribution to practice within their chosen field

S2 Apply theory and research methodology within the workplace, and feel comfortable in integrating different approaches to address 'messy' multidisciplinary problems in a rigorous yet practical manner

S3 Recognise budgetary, political, strategic, ethical and social issues when addressing issues within the workplace

S4 Reflect on their own work, and on themselves, and thus operate as a truly reflective independent practitioner

S5 Present and defend an original and coherent body of work which demonstrates, reflects upon, and evaluates the impact upon practice which they have personally made

Some portfolio items could cover almost all of the seven learning outcomes above, in most cases the listings are restricted to just those outcomes which are the main foci of the item, normally two or three learning outcomes at the most.

Note that some portfolio items have confidential sections that have been redacted; these are indicated in the tables below with a red background for the reference. Similarly some items are not reproduced in full in the portfolio; these abridged items are indicated in the table with an orange background for the reference. Most of the actual portfolios items have yellow highlighting on them to help indicate my involvement or input.

11.1 Association of Research Managers and Administrators (ARMA)

There are a large number of items in this group which on the whole provide evidence for my contributions to the profession of Research Management and Administration (see section 3.12). There are other ARMA related items listed under other areas, when they best fit there, predominantly in the ERA group.

Table 5: Portfolio Index Table for ARMA Items

Ref	Type	Description	Outcome(s)
ARMA01	Report	ARMA Annual Report 2008/09	K1, S1
This is an example of an annual report from the Association of Research Managers and Administrators (ARMA) that, as a director, I contributed to; it was circulated electronically to the approximately 1,350 members and in hardcopy to attendees the 2009 annual conference. On p5 it lists the Post Award Finance training session that I led in Loughborough. On p7 I wrote the Company Matters and Membership sections.			
ARMA03	Report	Post Award Financial Management (PAF) Programme	K1, S1, S4
This was the fourth iteration of the PAF training programme (and the third that I participated in), it has since run for a 5th time. I led the second and third and supported the other presenter, Andrea Tinson, in this the 4th event, helping her to lead her first ARMA event. The programme was updated after each event after reflecting on feedback from the delegates. This was my final iteration of the event as my job had moved away from post award and I no longer felt able to provide up to date information.			
ARMA05	Report	Speaker Biographies from the Nov 2009 PAF Event	S1
The 1 page speaker mini CV page that was included in the delegate packs for the Post Award Financial Management event (ARMA03). This was the first ARMA event that the other speaker had led, after my support from previous iterations.			
ARMA06	Report	Delegate bookings for Nov 2009 PAF Event	S1
This shows the 51 bookings (a few did not turn up on the day) for the event (ARMA03), from 36 different institutions; a mixture of old and new universities and some specialist institutions.			
ARMA18	Feedback	Evaluation from Nov 2009 PAF Event	K1, S3, S4
Nearly 50 people attended this course (ARMA03) (and a similar number for the previous two iterations that I was involved in). This feedback summary shows that our presentations and workshop sessions did indeed make a positive impact on most of the delegates.			
ARMA19	Report	Conference 2001 European Commission workshop	K1
I authored this report from the workshop (that I arranged) and it was distributed to conference delegates (about 90) and made available to the wider membership (approx 300). It includes reference to the European Commission's ERA submission system of the time, ProTool.			
ARMA20	Report	Conference 2002 Management Information workshop	K1
I authored this report from the workshop and it was distributed to conference delegates (about 80) and made available to the wider membership (approx 350).			

ARMA21	Report	Conference 2003 PGR Plenary Session	K1
I authored this report from the workshop and it was distributed to conference delegates (about 125) and made available to the wider membership (approx 400).			
ARMA22	Report	Conference 2004 fEC workshop	K1
I authored this report from the workshop and it was distributed to conference delegates (about 140) and made available to the wider membership (approx 600). I was subsequently asked by John Newton to present on fEC at an AURIL seminar in Newcastle the following year (Prof23).			
ARMA23	Report	Conference 2005 Je-S SRIF submission surgery workshop	K1, S1
I authored this report from the workshop and it was distributed to conference delegates (about 150) and made available to the wider membership (approx 800). I was also able to support the presenters, giving a research organisation perspective on using the Je-S SRIF submission screens.			
ARMA24	Report	ARMA Annual report 2009/10	K1, S2
p5 shows the Post-Award Finance (PAF – see ARMA03, ARMA05, ARMA06 and ARMA18) event that I delivered with Andrea Tinson. Page 6 shows the REF event that I ran the Newcastle iteration of. I wrote the Company Matters and Membership sections on p7. p12 shows me in the list of the board of directors, as company secretary.			
ARMA25	Report	ARMA newsletter #16, Jan 2009	K1, S1
The front page reports that the new website (that I, with Steff Hazlehurst managed the implementation of) had settled in. On p3 I also announced the forthcoming membership rates.			
ARMA26	Email	Result of the 2009 ARMA Election (Secretary position)	K1, S1
Of the roughly 1,350 ARMA members at the time, no-one stood against me and I was elected unopposed for a further 3 years as Director and Company Secretary.			
ARMA28	Slides	Initial version of fEC seminar 2007	K1, S1, S3
This seminar (and the workshops that followed) was attended by approx 50 people; it provided an opportunity for me to inform others of the fECAF system that I had developed at Sunderland. It resulted in an invitation to another University to provide advice on ERA systems development (ERA63). This session proved so popular (ARMA37) that it was re-run a month later (ARMA33).			
ARMA29	Slides	Mentoring session at INORMS2008	S1, S3, S4
At the second biennial INORMS conference on research management I ran a session on mentoring and presented it with a colleague that I had mentored (see ERA45) and a (now) colleague from Australia who had helped develop the Australasian Research Management Society (ARMS) mentoring scheme upon which the ARMA scheme was based. Around 20 people attended the session; including a number from overseas.			
ARMA30	Slides	Research Council Awards session at INORMS2008	K1, S1, S3
In conjunction with two colleagues (one from a pre-award perspective and one from a Research Council perspective) I organised and ran this session and gave the post-award perspective; it was attended by approximately 20 people; including a number from overseas.			
ARMA32	Email	Result of the 2006 ARMA Election (Secretary position)	K1, S1
Of the roughly 900 ARMA members at the time, no-one stood against me and I was elected unopposed to the position of Director and Company Secretary, from previously having been a non-executive director / board member.			

ARMA33	Slides	Follow-up version of fEC seminar 2007	K1, S1,S3,S4
The original event (ARMA28) was so popular that it was re-run; I was the only person who presented at both, and I led this second version. It was attended by approx 50 people and provided me with an opportunity to reflect on and learn from my performance from the previous months. I also managed the workshops and chaired the panel session.			
ARMA34	Report	RAG*net* Newsletter 3, Jul 2004	S1
This is one of the first electronic newsletters that RAG*net* produced; on the first page it lists me as elected committee member with responsibility for membership and recruitment. It has a short report on the 2004 conference in York that I organised.			
ARMA35	Report	Programme of talk on US Funding Sources (2003)	K1, S1
I was the only non-US speaker at this expert seminar on US funding (based on my experience of visiting funders in the US the previous year on a study tour, and of making a proposal to the NSF). There were around 50 delegates for this event.			
ARMA36	Report	Evaluation of the talk on US Funding Sources (2003)	S1, S4
This evaluation from one of my first presentations (see ARMA35) gave me cause for consideration. I had thought that I had prepared well but my nervous delivery masked the information that I tried to get over. In terms of reflection this feedback, although in my heart I knew it was coming, was certainly a critical incident. I needed to prepare even better, use appropriately sized content, and speak up, confidently.			
ARMA37	Report	Evaluation of the fEC Seminar in Leeds 2007	K1, S1, S4
Yet again I managed to be the lowest scoring speaker, but certainly my performance had improved over the four years since the US Funder talk (ARMA36). So much so that I was successfully able to run the second iteration of this event in London (ARMA33).			
ARMA38	Program	Supporting Research Proposals programme (2004)	S1, S3
I was involved in initiating the SRP training seminar series in 2004; this is the programme from the first iteration of the event. It ran again later that year and then again in 2006 (ARMA40) and now runs about once a year.			
ARMA39	Slides	Presentation from the first SRP event (2004)	S1, S3
The slides from my part of the first iteration of the daylong event (see ARMA38) on supporting research proposals (SRP).			
ARMA40	Slides	Presentation from the third SRP event (2006)	K1, S1, S3
This third iteration of the popular SRP series was the first after full economic costing (fEC) in the UK, so I had to develop this additional section, demonstrating my knowledge of the recently introduced costing and pricing methodology.			
ARMA41	Minutes	RAG*net* AGM minutes from 2000	K1, S1
These minutes from the AGM show my election to the executive committee of RAG*net* for my first 3 year term April 2000 to March 2003 as a non-executive director.			
ARMA42	Minutes	ARMA AGM Minutes from 2007	S1, K1
These are my first set of Annual General Meeting (AGM) minutes as ARMA secretary.			
ARMA43	Minutes	ARMA AGM Minutes from 2009	S1,K1
This reports my re-election as ARMA director and company secretary for a final term from August 2009 to Jul 2012.			

ARMA44	Program	Programme of the second PAF event (2008)	K1, S1
The original Post Award Finance (PAF) event was run in the December of 2007 and I was drafted in to run the second iteration in Sept 2008 in Loughborough with one of the original presenters. I have run (and refined) this course a further two times, in April (ARMA45) and November (ARMA03) 2009. The course covers post award finance of research projects including: context (national funding mechanisms), cradle to grave finance processing, sustainability and incentivisation, forecasting, and audit, as well as workshop sessions on funding scenarios			
ARMA45	Program	Programme of the third PAF event (2009)	K1, S1, S4
Building and reflecting on the success of previous iteration, I updated the programme and slides for this April event in Manchester. It was followed late the same year with another iteration in London (ARMA03)			
ARMA46	Program	Programme of the 2001 ARMA Spring Workshop	K1, S3
After the original conference organiser went on maternity leave I took up the organisation of the conference in terms of logistics and speakers. The conference in Newcastle was attended by nearly 100 delegates and speakers; see https://www.arma.ac.uk/news/conferences/sc01rpt.xhtml (accessed 25th April 2011, login required). I also produced one of the conference session reports (ARMA19).			
ARMA47	Program	Programme of the 2004 ARMA Spring Conference	K1, S3, S4
From the outset I undertook the logistical and programme arrangements for the conference held in York in 2004, learning from my experiences in 2001, and from other previous conferences. The event (see https://www.arma.ac.uk/news/conferences/sc04rpt.xhtml, accessed 25th April 2011, login required) was attended by over 150 delegates and speakers including the keynote Dr Ian Gibson, MP, Chair, House of Commons Select Committee on Science and Technology and hence also attracted the first press attendance at an ARMA event. I also produced one of the conference session reports (ARMA22).			

11.2 Electronic Research Administration (ERA)

These items pertain to developments and contributions that I have made in Electronic Research Administration (see mainly chapter 4; and the case studies in chapters 7 and 8). They include evidence of systems that I have developed, workshops and training events that I have held and reports and articles that I have written.

Table 6: Portfolio Index Table for Electronic Research Administration (ERA) Items

Ref	Type	Description	Outcome(s)
ERA03	Diagram	GRSdB Context diagram (2009)	S1, S2, S3
This diagram (see also Figure 1, p29) shows how the various elements of the GRSdB system (the blue boxes) interface with other IT systems (other coloured boxes) that are managed by other service departments in the University. The Estates system (white) data is imported into the fECAF (costing and pricing system, see section 7.3) to provide room data and costs. The Student Recruitment and Business Partnership (SRBP) service used (until it was replaced with pFACT, see section 7.4) the fECAF and Proposal sections for non-research proposals. SRBP also manage the SITS student record system which runs in parallel with the GRSdB Students (PGR) section. The Finance department looked after post award finance issues using the Projects part of GRSdB in conjunction with the Oracle Projects finance system. A separate Intellectual Property management database is fed (non-programmatically) from the GRS Projects system. And of course the Human Resources department have an HR System (Chris21) which is used to drive the core Employee information in GRSdB.			
ERA04	Diagram	GRSdB Entity Relationship Model Overview	S2
This shows the GRSdB database tables and their relations for a subset of the GRS system. The Publications areas (see section 8.2), the core areas describing Employee information and the hierarchical structure of the institution, and the fECAF (costing and pricing, see section 7.3) area, spread over 4 pages. It can be seen that the database structure underlying the GRS systems is quite extensive.			
ERA05	Paper	ERA Submitted to Acta Academica (via INORMS 2010)	K1, S4, S5
An academic paper that I drafted to support the poster (ERA22) that I presented at INORMS 2010. The paper was not selected for publication. It is however useful as it charts the history of the development of the ERA systems at Sunderland under my purview and reflects on the decisions made during the process.			
ERA07	Report	Programme for ARMA REF Event, Newcastle, Nov 2009	K1, S1, S3
This is the final programme for the research systems for REF event that I organised in Newcastle; for the presentations see (ERA09) and for the summary report see (ERA60). With Ian McCormick I organised the events and speakers and due to the expected (and realised) demand the event was run twice; I ran the Newcastle event and Ian ran the London event.			

ERA09	Slides	From the ARMA REF event, Newcastle 2009	K1, S1, S3-4
The slides from the ARMA Event (ERA07) that I organised in Newcastle (it was run again in London with some different speakers). The event had a good split of information giving and workshop style participation and the final report (ERA60) was distributed to all 1,600 or so ARMA members. My presentation reflected on the ERA and management work done at Sunderland for the 2008 RAE and the preparations for the 2014 Research Excellence Framework (REF) submissions.			
ERA14	Slides	ERA Presentation at JISC RSP Summer School 2009	K1, S1, S4
I was invited to present on ERA at the JISC Repository Support Project Summer School residential workshop in Sept 2009. My presentation covered RMA as a profession and a number of recent ERA related initiatives. This presentation led onto my being involved in the Welsh Repositories Network (WRN) workshop the following year (see ERA29).			
ERA18	Slides	Research Systems Presentation at ARMA 2009	K1, S1-S3
I organised this work session and asked two colleagues to join me in presenting their experiences of developing ERA systems. I ran a quick straw poll on which areas of ERA could perhaps affect quality and/or quantity of research and handed out the workshop questionnaire (ERAQ08), which resulted in the initial report (ERAQ03). We finished with a Q&A session. Over 70 people attended this workshop, including the managing director of ResearchResearch (who produce Research Fortnight and Research Professional) and subsequent conversations and emails (see ERA30) led to me making a presentation (ERA59) to them on research management issues.			
ERA20	Report	ARMA e-newsletter #17, Oct 2009	K1, S1, S5
Over my ten years on the RAG*net*/ARMA executive/board I contributed to many newsletters. This edition included on p1 my report from the 2009 ARMA AGM (ARMA43); feedback from the JISC repositories Support Project (RSP) Event that I presented at (ERA14); and the 3 page article that I co-authored on the RCUK Outputs and Outcomes Collection System (OOCS) Project (ERA25).			
ERA21	Poster	ERA Perceptions (from questionnaire), at ARMA 2010	K2, S1, S5
The poster that I presented at the 2010 ARMA conference in Manchester gave a summary of the preliminary findings from the ARMA questionnaire (ERAQ01) that I had run earlier in the year looking at the perceptions of RMAs to ERA in terms of whether or not they thought that different aspects of ERA systems could affect the quality and/or quantity of research undertaken. The final report (ERAQ04) and executive summary (ERAQ05) are available to members on the ARMA website.			
ERA22	Poster	ERA at Sunderland presented at INORMS 2010	K1, S1,S4,S5
This poster charts the development of the ERA systems that I developed at Sunderland over the sixteen years from 1995-2010. It was presented at the International Network of Research Managements Societies (INORMS) biennial conference in Cape Town in April 2010. More detail is available in the associated paper (ERA05) and database structures are shown in (ERA04) with some summary statistics also available (ERA42).			

ERA23	Poster	ERA case study and ideas on effects, at ARMA 2009	S1, S4, S5
I presented this poster at the ARMA 2009 conference in Southampton; it provided a brief case study on the fECAF costing and pricing system at Sunderland (see section 7.3) with some of my initial ideas on whether ERA systems might be able to affect the quality and quantity of research. The ideas were also discussed in the associated workshop (ERA18) that I ran.			
ERA25	Article	OOCS Article in Research Global, Oct 2009	K1, S1
I co-wrote this article on the Research Council's Outputs and Outcomes Collection System (OOCS) that was being developed; with my contributions being the non research council specific text. Research Global has a distribution of around 600. It also appeared in an ARMA newsletter (ERA20), distribution is around 1,500. It is also available online on the RCUK Research Outcomes Project website at http://www.rcuk.ac.uk/documents/oocp/OOCSArticle.pdf (accessed April 25th 2011).			
ERA28	Article	ARIADNE #64, Jul 2010, WRN-JISC-ARMA Event Report	K1, S1, S4
This report http://www.ariadne.ac.uk/issue64/wrn-repos-2010-05-rpt/ (accessed 25th April 2011) provides details of the presentations and workshops of the joint Welsh Repositories Network (WRN) - JISC – ARMA event, with links to my presentation (ERA29) and workshop sessions.			
ERA29	Slides	Joint WRN-JISC-ARMA Presentation: IRs and ERA (2010)	K1, S1, S4
As part of a joint workshop that I helped organise I gave a presentation with a colleague from JISC on how Institutional Repositories (IRs) relate to ERA systems (also known as CRISs for this presentation). The audience was approx 30 IR managers and 30 RMAs and the workshops that followed were highly interactive. The event was reported on in ARIADNE (ERA28). It also resulted in me being invited to give the keynote at a similar event in 2011 (ERA69).			
ERA30	Email	From ResearchResearch Ltd about my ERA work	S1
Jeska Harrington-Gould, the managing director of ResearchResearch Ltd, had attended my Research Systems workshop (ERA18) at the 2009 ARMA conference in Southampton and requested that I send her a copy of the initial findings (ERAQ03) of the workshop questionnaire that I trialled there. This led on to my giving them an invited presentation (ERA59) on the results and on ARMA and research management and administration in general.			
ERA31	Article	ERA at Sunderland, in Research Global, Oct 2010	K1, S1, S4
This is a non-academic and updated résumé of the article submitted to INORMS 2010 for consideration by Acta Acadmica (ERA05). It reflects on the developments of the GRSdB and proposed a more robust way forward. Research Global has a distribution list of around 600 Research Managers and Administrators around the Commonwealth and Europe.			
ERA34	Report	JISC Business Case for CERIF, Jul 2010	K2, S1, S3
This report (http://www.jisc.ac.uk/publications/reports/2010/businesscasefinalreport.aspx) (accessed 25th April 2001) presents the business case for the UK sector to adopt CERIF as a standard for research information exchange. It is based on the findings of the EXRI project (http://exri.ilrt.bris.ac.uk/, also see ERA58) and the work of the RIM stakeholder group (that I sit on). I am credited on p28 as one of the 12 people who were interviewed during the production of the report.			

ERA35	Report	ARMA Newsletter #18, Mar 2010	K1, S1
This newsletter reports that ARMA membership has risen to 1,500 and on p1 lists the special interest groups including the ERA one that I champion. p2 shows the membership renewal information that I provided. On p3 there is a brief update of current research information management issues from me, and on p4 a longer update on the RMAS project.			
ERA36	Report	ARMA Newsletter #19, Oct 2010	K1, S1
A recent copy of the e-Newsletter (that was sent to the circa 1,600 members). On p1 it reports the appointment of Marie Garnett as ARMA's Professional Development Manager. I also wrote a piece on p1 feeding back from the AGM. On p4 I gave an update on current development in the Research Information Management arena, including updates on CERIF and RMAS.			
ERA37	Report	JISC RIM2 Call Supporting Information, Oct 2010	K1, S1
The second round of JISC projects on Research Information Management was focussed towards the use of CERIF and a supporting document for bidders was developed for JISC by UKOLN. On p8 I am acknowledged for my input into the document from the CERIF alignment workshops that the JISC RIM group held in the summer.			
ERA38	Slides	First ARMA 'Level 2' Programme (2006)	K1, S1, S3
The slides from the first ARMA residential programme for research managers and administrators with 2-10 years experience, it shows a breadth of subject areas that RMAs need to be familiar with. I presented (with Dr Ian Carter) the session on IT, Data and Systems (slides 94-116). I also (with Kathy Brownridge) presented the session on Finance (slides 118-139). The feedback from the event is in (ERA39). There were approximately 50 delegates.			
ERA39	Report	Evaluation from ARMA 'Level 2' Course (2006)	S4
This is the feedback from the first residential course that ARMA ran for experienced research managers and administrators (see ERA38). It provided an excellent opportunity for reflection, not only on my presentations but on the different approaches that delegates took to different topics.			
ERA40	Slides	ARMA Websites for Research Expert Seminar, May 2000	K1, S1
One of my earliest contributions to an ARMA Event. The presentation itself was quite short and we presented a number of website case studies online followed by a workshop and Q&A session. There were 26 people booked on this event. There was to be a follow up event a couple of years later but this was overtaken by pressure of work.			
ERA42	Report	Statistics from the Sunderland GRSdB	K2, S1, S3-4
An overview of the GRSdB system in terms of statistics of usage, examples of data held and screen shots of the web interface. As well as a nearly 500MB oracle database the system contains nearly 4GB of 38,300 associated files and over 1GB of dynamic web pages and reports.			

ERA43	Proposal	IRIOS Proposal to the JISC RIM2 call, Nov 2010	K1-2, S1-3
I initiated the idea for the proposal and spoke to Gerry Lawson from NERC who was keen to be involved. He elicited support from Colin Haylock of EPSRC and I contacted Valerie McCutcheon at Glasgow, Anna Clements at St Andrews and Professor Keith Jeffery of euroCRIS who were all eager to be involved. I led the development of the proposal with input from the other partners. The proposal was one of only four that were funded (ERA51) from the RIM2 call. See http://www.jisc.ac.uk/whatwedo/projects/irios.aspx (accessed 25th April 2011) and http://www.irios.sunderland.ac.uk/ (accessed 21st April 2011). It was followed-up with the IRIOS-2 (2012) project.			
ERA45	Report	Final report from being a mentor	K1, S1-S4
This is the final report from the mentoring that I undertook for a colleague at another University. Amongst others things she said that *"Without question the experience has helped me to think much more broadly in terms of research management and given me a real sense of their being someone totally independent supporting me in developing into my current role."* The process also undoubtedly helped me to become more reflective by having to explain the whys and wherefores of various ERA related decisions that I had made. More recently, I have also mentored another colleague (Prof22).			
ERA46	Email	Invitation to discuss ERA at Durham University	K1, S3, S4
Invitation (which I accepted) to meet with the team at the research office in Durham to advise them on Electronic Research Administration; costing and pricing in particular, in order to inform their ERA strategy, see (ERA47) for a more recent example.			
ERA47	Email	Information given to Teesside University on ERA	K1, S4
Information shared with Teesside with regard to the state of the art in Electronic Research Administration systems in order to inform their development decisions. See (ERA46) for a more extensive example, in terms of the period of the advice.			
ERA48	Program	Je-S Programme Seminars (2008)	K1, S1
The success of the PGR events in 2007 (ERA66) lead onto a programme of RCUK Je-S regional seminars in May/June of the following year. I presented the Research Organisation (RO) view and participated in the Q&A plenary session at the first (16th May 2008 at the Institution of Engineering & Technology, London) of five events. Each were attended by 50-100 delegates from HEIs across the country.			
ERA49	Web	ARMA email list usage summary	S1
A snapshot (23rd Jan 2011) of the ARMA special interest group email list. This shows that of the 17 active lists the ERA list that I instigated and 'moderate' whilst only having the ninth largest number of members (199) has the third highest number of messages (after the member-announce and jobs lists which between them account for 54% of traffic) amounting to 10% of all message traffic. 14 months later (20th Mar 2012) membership had grown to 306.			

ERA50	Report	UKRO 2003 presentation including IMS user group	K2, S1-S4
This presentation was given by Dr Martin Penny, Director of UKRO (the UK Research Office in Europe) at the 2003 conference, highlighting the achievements of the past year. I am listed on slide 11 as one of the 4 'user' members defining the requirements for the IMS (Information Management System) project to develop a new web based personalise-able information system for UKRO subscribers. I fed in my experiences of developing a similar system at Sunderland focussing on ontological issues. IMS was rolled out the following year and is still used in 2011.			
ERA51	Grant	Award of JISC funding for IRIOS Proposal	K1-2, S1-3
This grant offer from JISC reports that the IRIOS proposal (ERA43) that I developed has been evaluated and selected for funding for the £64,365 applied for. This demonstrates that my knowledge and expertise in the field of Research Information Management (and hence ERA) is recognised by my peers in the UK. The follow-up IRIOS-2 (2012) proposal that I led received funding of £178,733.			
ERA52	Diagram	Entity Model of GRSdB Employees area (2005)	S2
This is a simple overview entity model of the Employees area of the GRSdB, it is less detailed than (ERA04) in terms of relationships, but shows more of the related tables and perhaps gives a clearer indication of the overall extent of the database.			
ERA53	Diagram	Entity Model of GRSdB Projects area (2005)	S2
This is a simple overview entity model of the Projects (and proposals) area of the GRSdB, this area is not included in the detail shown on (ERA04).			
ERA54	Diagram	Entity Model of GRSdB Publications area (2005)	S2
This is a simple overview entity model of the Publications (and seminars) area (see section 8.2) of the GRSdB, it is less detailed than (ERA04) in terms of relationships, but shows more of the related tables and perhaps gives a clearer indication of the overall extent of the database			
ERA55	Diagram	Entity Model of GRSdB Students area (2005)	S2
This is a simple overview entity model of the Post Graduate Research (PGR) student area of the GRSdB, this area is not included in the detail shown on (ERA04) .			
ERA56	Diagram	Entity Model of GRSdB GrAppl area (2005)	S2
This is a simple overview entity model of the GrAppl (costing and pricing, see section 7.2) area of the GRSdB, it is not included on (ERA04) which instead shows fECAF that superseded GrAppl.			
ERA57	Report	Summary of the Publications area of GRSdB (2010)	K1, S2, S4
I produced this summary report on the history and scale of the publications (see section 8.2) area of the GRSdB for the Deputy Vice-Chancellor. It was also used as a discussion paper in a steering group meeting for the development of the University's Institutional Repository system (SURE, see section 8.3)			

ERA58	Report	Pre-print of the EXRI Final Report Briefing Paper	K1, S1
The final version of this briefing report is available online at http://www.jisc.ac.uk/media/documents/publications/briefingpaper/2010/bpexriv1.pdf (accessed 25th April 2011). It is the culmination of the work of the EXRI project with the support of the JISC RIM Group, on which I sit (Prof01). The RMAS project, of which I am a steering group member (Est12), is also referenced. The RIM group of experts is referenced at the bottom of the second page, I was the ARMA representative.			
ERA59	Slides	Presented by invitation to ResearchResearch Ltd (2010)	K1-2, S1, S5
I was invited (ERA30) to give a presentation in April 2010 to the circa 30 staff at ResearchResearch on research management and administration and on my initial findings from the ARMA questionnaire (ERAQ01) that I had recently undertaken. There were many questions during and after the session, and the discussions continued long into lunch.			
ERA60	Report	Summary report from the 2009 ARMA REF events	K1, S1, S3
I wrote the majority of this report based on the Newcastle event that I organised (ERA07, ERA09). The initial draft was used to inform the planning for the London event; and then this report was updated to reflect input from the London event and then shared with the REF Team at HEFCE.			
ERA61	Email	Interest in Sunderland ERA system from RMAS report	K1, S1-2, S4
This is an example of the type of email that I often receive in relation to advice relating to ERA systems, this one resulted from the person (head of research office) reading a JISC report that talked about the RMAS project that I am on the steering group for.			
ERA62	Report	5 Year plan to replace ERA systems at Sunderland (2009)	S2, S3, S4
After reflecting on the current state and usage of Research Support (ERA) Systems at Sunderland I produced an outline plan for consideration by the University Business Systems Strategy Group. In effect the opportunity to join the RMAS steering group (Est12) and for Sunderland to subsequently become a pathfinder, with the associated funding attached, has enabled me to accelerate the implementation of the plan by almost 2 years.			
ERA63	Slides	Presentation to Manchester Metropolitan Univ. (2008)	K2, S4, S5
In 2008 I was invited to talk to Manchester Metropolitan University about the costing and pricing (fECAF) system that I had developed at Sunderland, in order to inform the decision making process at MMU with regard to their ERA aspirations.			
ERA64	Program	euroCRIS/NRC workshop programme (2011)	K1, S1
I was invited to present at this European workshop on “Integrating Research Information: CRIS + OA” to give both the perspective of research managers and administrators and also examples from the UK of how CRIS (ERA) systems can interact with Open Access (OA) and institutional repositories.			
ERA65	Report	RAE software development workshop report (2005)	K1,S1
At an ARMA RAE ‘Meet the team’ event I chaired a side workshop for institutional submitters to share experience and ideas with the HEFCE RAE software development team. This is the brief feedback report that I produced for members (and the RAE Team at HEFCE); the on-line publication link idea was incorporated into the final design.			

ERA66	Notes	Presentation from Je-S Regional Events (2007)	K1, S1
In 2007 RCUK rolled out some additional functionality on their Je-S system for post-graduate research (PGR) student data collection and wanted to promote it through a series of eight events across the UK. From my role on ROCG and the Je-S Steering Group I was invited to present and was able to do so at two events (6th Feb, Institute of Materials, London; and 14th Feb, Strathclyde University), these are the slides and notes that I used from the latter event. 50-100 HEI delegates from across the UK attended each event. A similar set of events were run in 2008 (ERA48).			
ERA67	Letter	JISC funding letter for RMAS (2011)	K1, S1, S3
The funding letter from JISC confirming the £1.1M funding from the HEFCE University Modernisation Fund (UMF) for the Research Management and Administration System (RMAS) project to develop an enterprise service bus and cloud enabled CERIF compliant RMAS for the UK HEI sector. As well as sitting on the steering group for the project, see (Est12). I was also the project lead for the £200,000 allocated to Sunderland as a pathfinder institution (ERA71).			
ERA68	Email	Confirming RCUK JGP Steering Group Membership	K1, S1, S3
In 2007, Dr Ian Carter and I were approached to represent the research organisation community on the RCUK Joint Grants Processing (JGP) Steering Group that set the direction for Research Council ERA developments until the Shared Services Centre (SSC) was created in 2010. Ian and I attended alternate meetings and shared notes with each other and the community between meetings.			
ERA69	Program	Repositories and CRIS event (2011)	K1, S1, S4
After the success of the WRN-JISC-ARMA event in 2010 (ERA29) the Repositories Support Project (RSP) decided to run a similar event the following year (19th July 2011 in Nottingham) and invited me to give the keynote session.			
ERA70	Report	Reporting from Institutional Systems (2011), Glasgow	K1, S1, S4
At this workshop I presented the GRS publications database and institutional repository (SURE) approach (see chapter 8) and provided a quick overview of the IRIOS (ERA43) and RMAS (Est12) projects that had recently been funded.			
ERA71	Web	Confirming Sunderland as one of 3 RMAS pathfinders	K1-2, S1-4
Having been invited onto the RMAS Steering Group in 2009 (Est12) I was well positioned to propose that Sunderland become one of the partner pathfinder institutions in the event that further funding was secured, which in 2011 it was (ERA67). I led the Sunderland pathfinder project with a HEFCE/JISC funded budget of £200,000. The project will, in 2012, deliver a cloud enabled, enterprise service bus architecture CERIF compliant ERA framework, with the potential to be used by HEIs across the UK. See http://as.exeter.ac.uk/rmas/overview.htm (accessed 25th April 2011).			
ERA73	Report	OCRIS Final Report that Acknowledges my contribution	K1, K2, S4
The first few pages of the 74 page final report from the OCRIS (http://cdlr.strath.ac.uk/ocris/, accessed 25th April 2011) JISC funded project on Online Catalogue and Repository Interoperability Study. I am acknowledged as a contributor on p4; whilst my contributions were small they demonstrate my desire to join up the various aspects of research management and administration.			

ERA74	Email	Invitation to attend a REF DCS Workshop	K1, S1, S4
Invitation (which I accepted) to attend a workshop organised by the REF Team at HEFCE to provide input into the user requirements for the Data Collection System for forthcoming Research Excellence Framework. Most attendees had (like me) been institutional data collection contacts for the previous system (for RAE 2008); we reflected on what worked well in the previous system, and areas that require improvement.			
ERA75	Email	Initial Report to Oracle on their ERA system	K1, S4
I was invited by Oracle UK to an individual demonstration of the mock up of their proposed new costing and pricing tool for research proposals (to complement their post award finance system). This email shows my initial responses, which was followed up with further discussions. I was able to provide input based on my experience as an RMA and from reflecting on my ERA developments at Sunderland.			
ERA77	Email	UAT schedule for Je-S PGR Admin functionality	K1, S4
As part of my role on the Je-S Management Board I was privy to information on Je-S system developments. I attended the Leeds event (about ten delegates) and helped the Je-S presenters demonstrate the proposed new functionality to the other University attendees. The Post-Graduate Research (PGR) student functionality was new and a number of the people at the user acceptance test (UAT) event had not used Je-S before.			

11.3 ERA Questionnaire (ERAQ)

In terms of new knowledge being generated, one major piece of work has been the national surveys on perceptions to Electronic Research Administration (ERA) that I have undertaken; these items can be found in this group; and see chapter 6.

Table 7: Portfolio Index Table for Electronic Research Administration Questionnaire (ERAQ) Items

Ref	Type	Description	Outcome(s)
ERAQ01	Report	The Questionnaire used for the ARMA ERA survey	S2
A pdf version of the on-line questionnaire used for the ARMA survey into Electronic Research Administration, see section 6.2. It is also available (to ARMA members) on-line at: https://www.arma.ac.uk/files/members/resource_directory/Research_Information_Management/Survey_13054873-(ERAMainSurvey).pdf, accessed 25th April 2011, login required.			
ERAQ02	Report	The Questionnaire used for the UK HEI ERA survey	S2
A pdf version of the on-line UK HEI questionnaire used for the follow-up survey on Electronic Research Administration designed to compare academic staff perceptions with those of research managers and administrators, see section 6.3.			
ERAQ03	Report	From the initial conference workshop in 2009	S1, S2
The feedback analysis report from workshop session 305 of the June 2009 ARMA conference, see (ERA18) where I conducted the workshop questionnaire, see (ERAQ08). Even though the sample size is small (22 of the 70 or so delegates completed the questionnaire) the results clearly indicate that the RMAs believe that certain aspects ERA can have a positive impact on research quality and quantity. It is available online at: https://www.arma.ac.uk/files/members/resource_directory/Research_Information_Management/Summary_of_305_Pilot_Questionnaire.pdf, accessed 25th April 2011, login required.			
ERAQ04	Report	Detailed analysis of the ARMA ERA Questionnaire	S1, S2, S4, S5
A major (34pp) piece of work analysing the 624 responses to the ARMA ERA Questionnaire (ERAQ01). The results clearly indicate, with statistical significance, that RMAs believe that ERA can increase both the quality and quantity of research undertaken. If the imperative is to increase research quality then it is perceived that the most fruitful area to look at is Costing & Pricing; and then Pre-Award and Post-Award. If increasing research quantity is paramount then Pre-Award and Costing & Pricing are perceived to be the most fertile areas for investment; and then Post Award. The report is available online at: https://www.arma.ac.uk/files/members/resource_directory/Research_Information_Management/ERAMainSurvey-feedback.pdf, accessed 25th April 2011, login required.			

ERAQ05	Report	Summary analysis of the ARMA ERA Questionnaire	S1, S2
The executive summary (5pp) of the detailed analysis (ERAQ04) of the large scale (624 responses) survey that I undertook in 2010 into the perceptions of RMAs to the effect that ERA has on the quality and quantity of research undertaken. It is available online at: https://www.arma.ac.uk/files/members/resource_directory/Research_Information_Management/ERAMainSurvey-feedback-executive-summary.pdf, accessed 25th April 2011, login required.			
ERAQ06	Report	Detailed analysis of the UK HEI ERA Questionnaire	K1, S1, S2
A major (47pp) piece of work analysing the 191 responses to the UK HEI ERA Questionnaire (ERAQ02) designed to elicit responses from both RMAs and academic staff as to their perceptions of ERA. The results clearly indicate that both groups believe that ERA can increase both the quality and quantity of research undertaken. Unsurprisingly RMAs are in general more positive than their academic colleagues. If the imperative is to increase research quality then it is perceived that the most fruitful areas to look at are, Peer Review, Costing and Pricing and Proposal Submission. If increasing research quantity is paramount then Funding Opportunities, Costing and Pricing and Proposal Submission could be considered. The report is available online at: https://www.arma.ac.uk/files/members/resource_directory/Research_Information_Management/ERAAcademicSurvey-feedback.pdf, accessed 29th April 2011, login required. These results are broadly in line with those from the earlier ARMA survey of RMAs only (ERAQ04), but are not directly comparable as the sub-area definitions were refined.			
ERAQ07	Report	Summary analysis of the UK HEI ERA Questionnaire	K1, S1, S2
The executive summary (5pp) of the detailed analysis (ERAQ06) of the (191 response) survey that I undertook in 2010/11 into the perceptions of academic members of staff and research managers and administrators to the effect that ERA has on the quality and quantity of research undertaken. It is available online at: https://www.arma.ac.uk/files/members/resource_directory/Research_Information_Management/ERAAcademicSurvey-summary.pdf, accessed 29th April 2011, login required.			
ERAQ08	Report	The Questionnaire used in the 2009 Workshop	S1, S4
My first attempt at a questionnaire, feedback included the lack of being able to provide negative impact; this was used to inform the design of the ARMA questionnaire (ERAQ01). However, the results were clear enough to provide a short analysis (ERAQ03).			

11.4 Esteem (Est)

These items broadly provide evidence for (either directly or indirectly) my standing in the field, providing underpinning for claims of my deep understanding of the research management and administration arena and particularly in relation to ERA, see sections 3.12 and 4.8 respectively.

Table 8: Portfolio Index Table for Esteem (Est) Items

Ref	Type	Description	Outcome(s)
Est01	letter	Letter of thanks, re ROCG Membership	K1, S1
A thank-you letter from the Phil Sooben, the Chair of the RCUK Operational Strategy Group (OSG) for my time (2006-2010) as an ROCG Member. The Research Organisation Consultation Group (ROCG) is the primary method of interaction between HEIs (and other research organisations) and RCUK. The ROCG provides input into RCUK policy, in particular in relation to the management of research grants and contracts.			
Est02	email	Invitation to join HEFCE LGM PI Project Steering Group	K1, S2, S3
An email from Jane Wellens, the PI Project Manager from the University of Nottingham, following up from (Est03). I was invited to join as an ARMA representative and subsequently provided input into the project management part of the developed website resource (Prof11): http://www.vitae.ac.uk/policy-practice/273421/Project-background.html (accessed 25th April 2011). In effect my contribution was to provide a description of the processes of research management for Principal Investigators (PIs).			
Est03	Minutes	of LGM PI meeting where it was suggested that I join	K1, S2, S3
The minutes of the meeting of the Leadership Development for Principal Investigators (HEFCE LGM PI Project) Steering Group at which it was agreed to invite me (and others) to join the steering group – see agenda item 7ii. This item shows my standing in the field, known to have sector-wide experience and knowledge of research management and administration, see (Est02, Prof11)			
Est04	Email	from Pete Dixon, SSC asking for me to be a referee	K1, S3
An email from Pete Dixon the Je-S/GMG Support Manager at the RCUK Shared Services Centre asking me to be a referee on a tender opportunity that they were bidding for. My reply demonstrates a good understanding of the ERA landscape by correctly surmising the proposed system to be developed.			
Est05	Update	From UKRDS SG Chair on progress	K2, S3
This update from Professor John Wood of Imperial College, chair of the UK Research Data Service (UKRDS) Steering Group indicates the value he places on the membership (of which I was one, see Est16). The UKRDS (see http://www.ukrds.ac.uk/, accessed 25th April 2011) project tested the viability of setting up a UK repository for storing research data sets. See (Est24) for an example of the work that the project produced.			

Est08	Report	Draft Report on Je-S, sent to me for comment	K1, S1
This is the draft version of a desk study to review the potential for reinvigorating the Je-S costing upload service written by Duke & Jordan Ltd for the JISC Flexible Service Delivery (FSD) programme. I was invited to provide comment on the report due to my expertise in ERA. I was also one of the telephone interviewees for this study.			
Est09	Agenda	UKCGE-ARMA event draft agenda	K1, S1
I was invited by UKCGE to present at this event on Current Issues in Research Management and Administration (this is the programme as originally advertised) but was unable to do so due to a diary clash. So I arranged for Dr Ray Kent (from the ARMA Board and Head of Research Development & Policy Support, Loughborough University), Claire Skinner (Faculty Head of Research Support, University of Leeds) and Dr Mark Mortimer (Director of Research and Enterprise, University of York) to run the workshop on Models of Research Support in my stead (see http://www.ukcge.ac.uk/events/eventsarea/manandadmin10, accessed 25th April 2011).			
Est10	Email	RO input into proposed Je-S registration options	K1, S1
This email shows my co-ordination role in feeding UK University (and other research organisations) input into shaping the RCUK Je-S system. I gave my feedback to Janet Niven, the Je-S Helpdesk Manager, verbally and agreed to canvass for wider opinion. This is also an example of the use made of the ARMA ERA email list that I set up (see ERA49).			
Est11	Email	Invitation to review JISC RIM proposals	K1, K2, S3
An email invitation to thirty or so UK experts on Research Information Management to review JISC proposals in this area. I evaluated the proposals and took part in the panel ranking in order to determine the projects to be funded.			
Est12	Email	Invitation to join the RMAS project steering group	K1-2, S1-3
The aim of the HEFCE funded RMAS project was to try and develop a sector wide Electronic Research Administration (ERA) system (dubbed a Research Management and Administration System - RMAS), (see http://as.exeter.ac.uk/rmas/, accessed 25th April 2011). I was invited to join the project steering group in 2009 after the initial phase of the project. The next phase of the project has been funded (ERA67) and I led the Sunderland pathfinder part of the project (ERA71). The project will develop a procurement framework for an integrated modular 'mix and match' system which will then be made available to all UK Universities. This is probably currently one of the most important projects in the ERA arena in the UK.			
Est13	Email	Thanks for talk and invite to write an article (ResRes)	K1, S3, S4
This is an email from Jeska Harrington Gould, Managing Director at ResearchResearch (see http://www.researchresearch.com/, accessed 25th April 2011) thanking me for the presentation (ERA59) that they invited me to give at their London headquarters on research management and administration and the preliminary findings from the ARMA ERA Questionnaire that I undertook. Ehsan Masood, the editor of their UK fortnightly publication on research policy and funding (Research Fortnight) subsequently invited me to write an article for them, see (Prof08).			

Est14	Email	Invitation to join the UUK Open Access group	K1
Invitation to join a Universities UK (UUK) national expert advisory group to update their position statement on open access publication. I was unable to accept because of diary clashes but passed the opportunity on to the ARMA board and Dr Ian Carter, the chair, was able to attend. The current statement is available at: http://www.universitiesuk.ac.uk/PolicyAndResearch/PolicyAreas/Documents/Research/OpenAccessUUKPolicyStatementSept2005.pdf, accessed 29th April 2011.			
Est15	Report	From the 2010 Vitae Policy Forum	S1, S3, S4
The report produced from the 2010 Vitae Policy Forum included (p8) some of the points that I made during the stakeholder panel session (see Est17). The Vitae Policy forum is an annual invitation only event for PVCs or equivalent (see http://www.vitae.ac.uk/researchers/1151-126801/Vitae-policy-forum-2010.html, accessed 25th April 2011).			
Est16	Web	UKRDS About Us	K2, S3
This shows the steering group of the UK Research Data Service project which I was a member of, see (Est05) and http://www.ukrds.ac.uk/about, accessed 25th April 2011. One of the summary reports can also be seen in the portfolio (Est24).			
Est17	Web	Programme from the 2010 Vitae Policy Forum	S1, S3, S4
Originally Dr Ian Carter was due to take part in this stakeholder discussion, but he was unable to attend. Janet Metcalf, the Chair of Vitae invited me to take his place to provide the view of research managers and administrators in the debate on funding for researcher development. See http://www.vitae.ac.uk/policy-practice/1151-126801/Programme/Vitae-policy-forum-2010.html#pageInfo, accessed 25th April 2011. The report from the event (Est15) is also available.			
Est18	Email	Invitation to join UUK FP8 sounding board	K2, S3
An email invitation (which I accepted) to be part of a Universities UK (UUK) sounding board to develop a UK HE position on the European Commission's proposals for Framework Programme 8 (FP8, now called Horizon2020). This group developed a short position statement (see http://europeunit.ac.uk/sites/europe_unit2/resources/FP8Position.pdf, accessed 29th April 2011) which will directly feed into the UK negations on the next framework programme which will distribute billions of Euros of research funding across the UK and Europe. See also http://fpmatters.europeunit.ac.uk/sites/fpmatters/home/fp8_advisory_group.cfm, accessed 25th April 2011.			
Est19	Email	Thanks for reviewing JISC eContent proposals	K1, S1, S3
This email from UK Joint Information Systems Committee (JISC) thanks me for reviewing proposals to the JISC Grant Funding call: e-Content Programme Strand A: Enriching via Collaboration call (I reviewed five proposals) and invited me to the panel meeting (which I was unable to attend; but I sent additional comments for consideration).			
Est20	Email	RO Representative on Je-S Steering Group	K1, S1, S3
The email from the Research Councils shows my appointment to the Je-S 1 Steering Group. This group oversaw the roll out and subsequent developments for the Research Council's joint electronic proposal submission system, Je-S. The first meeting was held on 6th May 2004. In 2006 it became the Je-S Management Board (see Est22) and then in 2011 with the move to the RCUK Shared Services Centre the group was disbanded, my input over the seven years is recounted in (Est22). See also (Est21).			

Est21	Papers	RCUK Je-S Management Board	K1, S1, S3
The agenda and terms of reference for the Je-S Management Board that superseded the Je-S Steering Group see (Est20). This first meeting was 25th Sept 2006 (and the final meeting was on 26th Jan 2011); see (Est22) for an outline of my contributions. After that the responsibility for Je-S developments was moved into the RCUK Shared Services Centre (SSC).			
Est22	Email	Thanks from the Chair of RCUK Je-S Management Board	K1, S1, S3
This email provides confirmation of my role on the Je-S Management Board (Est21; and Steering Group (Est20) before that) and outlines some of my contributions and the esteem in which they are held by the Research Councils.			
Est23	Email	Invitation to join JISC Researcher Identifiers group	K1, S1
An invitation to join the UK Joint Information Systems Committee (JISC) Researcher Identifier Task and Finish Group (which I advocated setting up) to advise JISC on an efficient and effective way to assign unique identifiers to researchers (in the UK). This is a prerequisite of being able to create an infrastructure within which research management information can be effectively shared across the sector.			
Est24	Report	UKRDS The Data Imperative, summary report, 2009	K1, S1, S3
The 16 page summary report from the HEFCE funded UK Research Data Service project looking at the business case for a UK wide research data archive service. I sat on the steering group for this project which proposed a two year pathfinder project to demonstrate the feasibility and utility of such a service. See www.ukrds.ac.uk, accessed 25th April 2011, (Est16) and (Est05).			
Est25	Email	BRUCE Project Advisory Group	S1, S2, S3
The BRUCE project is one of the four JISC RIM2 projects (another is IRIOS, see ERA43, that I led) looking at the use of CERIF in the UK. I provided some informal advice in the generation of the project proposal which contributed to its success and was subsequently invited to join the project advisory board of nine people to help define the draft sector benchmark reports for research activity.			

11.5 Sunderland Focus Group (FG)

I undertook a systematic review of two elements of ERA systems that were being replaced at Sunderland and the work related to that is listed here, see section 5.7.1 and the case study chapters 7 (costing and pricing) and 8 (publication information). This work was based on a series of Focus Groups that I instigated.

Table 9: Portfolio Index Table for Focus Group (FG) Items

Ref	Type	Description	Outcome(s)
FG01	Report	Questionnaire developed from Sunderland Focus Groups	S2
In 2010 I ran a series of Focus Groups (see FG02) to look at the issues with two specific elements of the ERA systems that I developed at Sunderland (costing and pricing and publication information, see chapters 7 and 8 respectively) with the aim of providing user feedback input into the replacement systems being implemented. This is the questionnaire that was developed from that work and used in a University wide survey, the results of which are in (FG03).			
FG02	Report	Summary of the Focus Group Activities	S2
In 2010 I ran a series of Focus Groups (see FG03) to look at the issues with two specific elements of the ERA systems that I developed at Sunderland. The work of the groups informed the questionnaire (FG01) that was rolled out to all staff at Sunderland. This report was shared with and agreed by the Focus Group members.			
FG03	Report	From Focus Groups and resulting Questionnaire Analysis	S2, S3, S4
This (10 page) report was created from the work of the Focus Group (FG02) and evidence from the analysis of the [n=155] responses to the questionnaire (FG01) that it advocated. The report with its 13 specific recommendations was submitted to and accepted by the University Business Systems Strategy Group in Nov 2010.			
FG05	Slides	Used in the 2010 Focus Groups	S2, S3, S4
These slides show the structure and content of the focus groups (FG02) that I organised to look at the costing & pricing (see chapter 7) and publication information systems (see chapter 8) that I developed. Thanks are owed to (now Dr) Paul Andrew and Dr Mark Proctor who acted as neutral facilitators for the administrative and academic groups respectively.			

11.6 Historical Items (Hist)

I have included a small number of items which either pre-date the main body of the work described (1996-2011) or for one reason or another fall outside the main thrust of this doctoral report, see section 2.1. They are provided as additional evidence, with particular reference to doctoral learning outcome element S5 in terms of defending my own work.

Table 10: Portfolio Index Table for Historical (Hist) Items

Ref	Type	Description	Outcome(s)
Hist01	Paper	Journal article about the SupplyPoint project (2000)	S2, S5
I was the main author for this article (and presented the paper at the Electronic Commerce and Web Technologies conference from which the journal article was drawn) on the SupplyPoint project (see Hist04). The article is available (by subscription) online at http://www.springerlink.com/content/vuqmghtyh74h62ch/ (accessed 25th April 2011) and at http://imu.ntua.gr/Papers/J30-ECWeb-SPP.pdf (accessed 25th April 2011). I was also the principal investigator for the project.			
Hist02	Paper	Journal article about the SupplyPoint project (1998)	S2, S5
This article that I co-authored about the EU Framework project SupplyPoint (see Hist04), that I was the project manager and principal investigator for, was the most downloaded article from the International Journal of Electronic Markets in 1998. It is available online at: http://www.electronicmarkets.org/issues/volume-8/volume-8-issue-3/supplypoint0.pdf (accessed 25th April 2011).			
Hist03	Report	List of my academic and professional publications	K1-2, S2, S5
This is the list of my academic and professional publications over the period 1992-2010. Together they show a consistent ability to publish subject to peer review in areas that I have been active in, specifically computer science, research management and administration, and the confluence of those two areas, Electronic Research Administration. The report itself is an export of a standard report from the GRS On-line system that I developed (see http://www.grs.sunderland.ac.uk, accessed 21st April 2011), see section 4.5 and chapter 8.			
Hist04	List	Final deliverable from the ESPRIT SupplyPoint Project	S2, S3, S5
In 1996 I led the writing of a proposal to the EU ESPRIT4 programme for a project (SupplyPoint) to develop a proof of concept demonstrator of a system to support companies coming together to form virtual consortia to bid for contracts in the construction sector (see Hist01, Hist02). The project was funded by the European Commission to the value of €1.4M and ran from 1997-2000 with me as the Principal Investigator leading the consortium with academic and commercial partners from the UK, Denmark, France, Germany and Greece. This is a list of the final deliverables from the project that were made available to interested parties on the internet (see http://web.archive.org/web/20010418221816/http://www.supplypoint.org/ accessed 29th April 2011; the original website is now defunct) and compact disc.			

11.7 Profession (Prof)

These items specifically support my claims to developing the Research Management and Administration profession, see section 3.12. Note, however, that ARMA specific items will be found in the ARMA section (see 11.1 above).

Table 11: Portfolio Index Table for Profession (Prof) Items

Ref	Type	Description	Outcome(s)
Prof01	Minutes	JISC RIM minutes of 4th meeting (21st Jan 2010)	K2, S1, S3
Minutes of the 4th Joint Information Systems Committee (JISC) Research Information Management (RIM) group meeting. I provided (p2) an update to the group on the progress of the RMAS (see Est12) project. I also contributed to the (p4) EXRI project recommendations for the UK to adopt CERIF as a standard for exchange of research information data. This was a pivotal meeting where the group agreed to endorse the proposal that CERIF be adopted as a UK standard. The RIM group is *"made up of Higher Education or research-based stakeholders from the UK and International research information community. The aims of the group are to enable disinterested discussion, knowledge sharing and strategic coordination of efforts to improve the management and exchange of research information within and between research organisations, funders and agencies."*			
Prof02	Slides	Presentation at INORMS2010 on RMA Development	K1
I gave a workshop presentation on Professional Development for Research Managers and Administrators at the International Network Of Research Management Societies (INORMS) 2010 conference in Cape Town, South Africa. The slides provided a backdrop for discussion and later at the conference I organised an informal meeting on professional development with representatives from a number of national associations (see Prof12).			
Prof04	Paper	Professional development submitted to INORMS2010	K1, K2, S5
This academic paper was submitted in conjunction with the workshop (see Prof12) session at International Network Of Research Management Societies (INORMS) 2010 for consideration in the conference proceedings in a special issue of Acta Academica, it was not published.			
Prof06	Article	An updated summary of the INORMS2010 paper	K1, S1, S4
A professional article, an updated précis of the paper (see Prof04) written for the International Network Of Research Management Societies (INORMS) 2010 conference. Global Research Management (GRM) is a publication of the Association of Commonwealth Universities (ACU), see http://www.globalrmn.org/, accessed 25th April 2011, with a distribution of around 600.			
Prof07	Editorial	On the Research Fortnight Heaven and Hell article	S1
The publication of my article (see Prof08) on research management and academic staff next to the counterpoint by Professor David Colquhoun led to great discussion at the 2010 ARMA conference. These discussions were the lead item in the editorial of the following edition of Research Fortnight (16th June 2010). See section 3.3 for my reflections on the articles.			

Prof08	Article	In Research Fortnight – research management debate	K1, S1, S4
After presenting to the staff at ResearchResearch Ltd (see Est13), I was invited to write an article (to be part of a pair) on the relationship between researchers and research managers (from the view of the latter). This was published on Jun 2nd 2010 (p18) just in time for the 2010 ARMA conference and with the counterpoint piece by Professor David Colquhoun (p19) promoted a lot of debate (see Prof07). See section 3.3 for my reflections on the articles.			
Prof10	Ppt	Overview of ARMA 2010	K1
I created the first 'formal' corporate presentation about ARMA for informational purposes. It was originally developed in late 2009 and updated with suggestions from other board members and released in Feb 2010. It is available on the ARMA website at http://www.arma.ac.uk/files/guest/Information/ARMAOverviewFeb2010-1.pdf (accessed 12th Jan 2011). I updated it in early 2011, see (Prof14).			
Prof11	Web	Page showing the HEFCE LGM PI project background	S1
I was an invited member of the steering group (Est02) for the HEFCE funded LGM PI project that developed an on-line resource for Principal Investigators (see http://www.vitae.ac.uk/pi, accessed 25th April 2011). As part of my role on the steering group I reviewed and commented on the text on most pages and wrote most of the text for the project management section. This website went live on 12th Jan 2011.			
Prof12	Notes	From a meeting that I arranged at INORMS2010	K1
At the International Network Of Research Management Societies (INORMS) 2010 conference, after the interest in my presentation (Prof02) I arranged an informal meeting with interested parties in order to share best practice on professional development. These are the notes that I made and distributed after that meeting. It was followed up with (Prof13).			
Prof13	Report	On the professional development offerings of ARMA	K1
After the meeting in Cape Town at INORMS (Prof12) I developed this summary of the professional development activities of ARMA and sent it to those at the meeting (and others that expressed an interest afterwards) including associations from the UK, Europe, Denmark, USA, Canada, Australia, India, the Commonwealth and Africa.			
Prof14	Slides	Overview of ARMA 2011	K1
This is an updated version of (Prof10). Directorships and membership statistics have been updated.			
Prof15	Booklet	AUA Handbook: Supporting Research (2004)	K1, S1
Steff Hazlehurst made a substantive update to a previous good practice guide by Marion McClintock to produce this 32 page booklet for the Association of University Administrators (AUA). On p28 she credits me on my helpful comments on an earlier draft. This handbook is available to the AUA membership of around 4,000 UK University administrators.			
Prof17	Email	Thanks for contribution to Postgraduate Review, 2010	S1
Email of thanks from Professor Adrian Smith for the contributions that I sent in (a synthesis of my own thoughts with input from colleagues at Sunderland) to the review of Postgraduate Education in 2010.			

Prof18	Program	NE-ARMA five event programme (2010)	K1, S1, S3
I was instrumental in setting up the regional group of heads of research offices in the five campus based universities in the North-East of England. In 2009 we determined that there were many members of staff that could not access ARMA courses and so we decided to develop and implement our own course focussed on our own HEIs, (Prof19) shows the feedback.			
Prof19	Report	Evaluation of the NE-ARMA course	K1, S1, S4
After each event of the NE-ARMA course (Prof18) I undertook a feedback questionnaire. After allowing for a period (6 months) of reflection I surveyed the participants again to see if there was any lasting benefit from the course. This summary report (a full report is available on-line at http://www.grs.sunderland.ac.uk/AcademicServicesWebFiles/GRS/NE-ARMA2010EvaluationReport.pdf, accessed 21st April 2011) clearly shows the lasting benefit of the course.			
Prof20	Program	Brunel (BRAM-NET) research administrators conference	K1, S1
ARMA was invited by the Brunel University research office to present at their inaugural conference for research administrators (dubbed BRAM-NET). I was available and offered to present on behalf of ARMA, for the slides see (Prof21).			
Prof21	Slides	From BRAM-NET research administrators conference	K1, S1
I was asked to cover ARMA, the developing professional development framework and models of research support. I updated and modified some of my own slides (see Prof14) and those from other ARMA presentations on similar subjects (in consultation with the previous presenters). There were around 30 attendees.			
Prof22	Report	Mentoring Agreement with a mentee from another HEI	K1, S1, S4
This outline agreement shows that I have been paired with a colleague from a research intensive university in order to help her plan and prepare for a career in research management and administration. I suspect that the relationship will be much more of a mentor-mentee relationship as compared to the mentor-buddy situation that evolved with my previous pairing (ERA45).			
Prof23	Slides	Presentation: fEC for commercial activities, AURIL (2005)	K1, S1, S3-4
I was invited by John Newton (then of Joint Costing and Pricing Steering Group - JCPSG) to give a talk on full economic costing (fEC) of commercial activities at a workshop he organised for the Association for University Research and Industry Links (AURIL) in June 2005. At that time most of the focus was on fEC for research, but the fECAF system that I devised (see section 7.3) provided fEC calculations for commercial activities too, I spoke about the underlying principles of my methodology.			
Prof24	Report	Update on Professional Development Framework	K1, S1, S3-4
This is the Feb 2011 update from Marie Garnett, the ARMA Professional Development Manager. As an ARMA board member I have actively contributed to the development of the framework and have shared information (eg Prof04, Prof13) with Marie in order to provide context. I helped to organise the North-East Focus Group and have provided direct input into the framework. I have also presented on the framework (Prof21).			

Prof25	Report	Extract from AUA 2002 Conference Programme	K1, S1, S3
The programme and workshop listings from the full 28 page conference programme handbook are reproduced with the workshop session that I gave (121 How research is funded in the UK (SFS)) highlighted. The presentation covered the dual support system with details of how various research funding streams arrive at universities. Around 50 delegates attended the session.			