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| **Institution:** | Aberystwyth University |
| **Unit of Assessment:** | 36: Communication, Cultural and Media Studies, Library and Information Management |
| **Title of case study:** | Managing Digital Assets |

**1. Summary of the impact** (indicative maximum 100 words)

Department of Information Studies (DIS) researchers (Judith Broady-Preston, Nicole Convery (née Schulz), Kirsten Ferguson-Boucher, Allen Foster, Sarah Higgins) contribute to the preservation and long-term accessibility of digital assets across the heritage, public, private and commercial sectors. They have developed, and widely disseminated, a series of toolkits and models which are helping government, professionals and organisations adapt to the changing technical landscape. Their research informs and influences data management policy and practice; provides guidance on operational and lifecycle management of digital information; and underpins the relevant sections of professional guidance documents by high profile international and national organisations. Knowledge is contributed to both: information practice and policy advancement; and practitioner continuing professional development (CPD), through participation in international and national training events, working groups and practical workshops.

**2. Underpinning research** (indicative maximum 500 words)

DIS's research regarding the management of digital assets concentrates on the neglected area of the organisational strategy and relationships required for success. The need for tools and models to facilitate professionals and organisations in the practical decision making processes, when planning the lifecycle management of digital assets and the implementation of emerging technologies, were identified in the areas of cloud computing, data management and digital forensics. These tools influence the development of: strategy for managing digital materials at local, national and international level; practical project planning for administrative and implementation challenges; and the improvement of CPD for practitioners.

- *The VaPaR Model* (Value, Alignment, Performance, Assurance and Risk) addresses the governance and assurance implications of managing digital assets through emerging technologies. Building on earlier research from DIS, it defines and identifies the key problems into one cross-disciplinary model to assist in identifying both the perspectives and roles of different professional stakeholders **(3.1)**.
- *The Cloud Computing Toolkit* **(3.2)** focuses on one of these emerging technologies, *cloud computing*. Building on the *VaPaR Model*, it provides more complete guidance on the management, operational and technical issues surrounding the storage of information in "The Cloud". Funded through a research grant from the primary professional body for UK archivists, The Archives and Records Association (ARA), the research had considerable practitioner input through a survey, in depth interviews and case studies, and an "Unconference*"* (Manchester, 2010).
- *The Lifecycle of Data Management* (Higgins, 2012) **(3.3)** elaborates the lifecycle approach to digital asset management. This work focuses on the activities required to manage digital assets and the organisational, personnel and technological implications of these.
- A specific element in the *VaPaR Model* and lifecycle approach is the role that digital forensics can play in the retrieval of information from the various technologies. *The Digital Forensics Continuum Model*, developed in collaboration with researchers at the *University of Washington Centre for Information Assurance and Cyber Security* (CIAC), helps professionals and organisations adapt to new information storage methodologies in cloud technologies. Its application is developed in a book for practitioners (Endicott-Popovsky & Ferguson-Boucher, 2012) **(3.4)**.
- The *KABSAi Model (Knowledge Architecture, Behaviour and Situation Analysis)* evaluates previous research, both external and internal to DIS, to build an integrated model which can help professionals and organisations understand how to effectively deliver digital material to their users. It develops an understanding of how users interact with information and how to evaluate and measure information process, behaviour and management on multiple levels **(3.5)**.

**3. References to the research** (indicative maximum of six references)


3.1 [professional conference address] Ferguson-Boucher, K. (2012). *VaPaR in the Cloud: A Model for Information Governance and Assurance in the Cloud*. The Future of Information Governance Conference. London

3.2 [grant funding] Convery, N. (2010). *Cloud Computing Toolkit: Guidance for Outsourcing Information Storage to the Cloud*. ARA UK and Ireland.

3.3 [book chapter] Higgins, S. (2012). The Lifecycle of Data Management. In G. Pryor (Ed.), *Managing Research Data*. Facet Publishing.

3.4 [book chapter] Ferguson-Boucher, K. & Endicott-Popovsky, B. (2012). Forensics Readiness in the Cloud (FRC): Integrating Records Management and Digital Forensics. In K. Ruan (Ed). *Cybercrime and Cloud Forensics: Applications for Investigation Processes*. IGI Global DOI: 10.4018/978-1-4666-2662-1.ch005

3.5 [peer reviewed journal article] Foster, A., Ferguson-Boucher, K., & Broady-Preston, J. (2010). Unifying Information Behaviour and Process: A Balanced Palette and the Balanced Scorecard. *Performance Measurement and Metrics*, *11*(3), 280–288. DOI:10.1108/14678041011098550 [*REF2 Submitted*]


**4. Details of the impact** (indicative maximum 750 words)

DIS's holistic research into managing digital assets is informing and influencing information management practice and policy globally while contributing to professional development. This is evidenced through: practical implementation of the toolkits and models developed; policy and advice documents and CPD which take different aspects of the research as their basis; and demand for researcher expertise by professional bodies.

The Cloud Computing Toolkit provides guidance on the management and operational issues surrounding the lifecycle storage of information in the cloud. It was widely disseminated through: the ARA website and meetings; international professional conferences and workshops; and online bibliographies. Information professionals have been trained in using the toolkit to: assess the risks and benefits of outsourcing information storage and processing to the cloud; assess cloud computing services; and develop strategies for their organisation. It underpins key guidance texts on managing digital archival material by major international projects and institutions, including the US National Archives and Records Administration (NARA) **(5.1)** and the internationally adopted InterPares Project **(5.2)**, which aim to influence data management policy and practice and data managers' professional methods and ideas in the areas of information privacy, organisational risk and performance and the human impact of change and informs and influences.

Research into the lifecycle management of digital materials is influencing professional methods and the development of expert systems through the comprehensive articulation of the work-flow and activities required to manage digital assets. It is contributing to practical implementation projects and cross-sectorial CPD for information professionals charged with managing digital assets.

Support is given to the Archives and Records Council Wales Digital Preservation Group (ARCWDP) in both preparing a business case and implementing a shared digital preservation infrastructure for Wales **(5.3)**. Expertise has been used to chair the ARA Section for Archives and Technology - a professional group which provides professional digital asset management networking and training - 'between June 2011 and June 2013 [and] contributed greatly to the Section on delivering projects such as the Guide to Standards and nationwide training on Digital Preservation' **(5.4)**.

The book chapter, The Lifecycle of Data Management was requested by the Digital Curation Centre's Associate Director for inclusion in the book Managing Research Data. This reached Amazon's number one best seller, in their library management category, was ranked in the top 15 for a year after publication, and sold out of its UK print run after a month **(5.5)**. Since publication, the chapter has been used by the Digital Curation Centre (DCC) to support their internationally offered professional training course, Digital Curation 101. This training course is typically attended

by professional data managers and has been offered 35 times since January 2012 http://www.dcc.ac.uk/training/dc-101) **(5.6)**. The chapter forms the basis of CPD materials for librarians developed by RDMRose **(5.7).**

The Digital Forensics Continuum Model was first developed and presented at the influential Information Security, Compliance and Risk Management Institute Conference, Seattle (2008), attended by information security professionals, information technology officers and managers, attorneys, researchers and risk management and financial professionals, it focused on privacy, data protection, information assurance and technology management. The model was further disseminated to professional practitioners and expert systems developers at the Information and Records Management Society's Annual Conference (2009) **(5.8)** and a professional symposium attended by practitioners in Welsh local authorities and SME's at the National Library of Wales (NLW) (2012), and has been incorporated into training materials from the Australian based Recordkeeping Institute: "The extension of the recordkeeping model into recordkeeping informatics is via the other related models including the information continuum, the publishing continuum, the data continuum, the digital forensics continuum." **(5.9)** and into a podcast available online.

As a result of dissemination of the underpinning research, researchers further contribute their expertise to the information professionals' CPD through editorship of online advisory material aimed at helping members of professional organisations adapt to technological change. These advise professionals on technical implementation of data management solutions and include the Digital Preservation Coalition's Technology Watch Series **(5.10)**.

**5. Sources to corroborate the impact** (indicative maximum of 10 references)

5.1 The US National Archives and Records Administration (NARA). (2012). *Toolkit for Managing Electronic Records*. Available at http://www.archives.gov/records-mgmt/toolkit/pdf/all-nara-non-nara-tools.pdf.

5.2 InterPares and International Council on Archives. (2012). *Digital Records Pathways*. Module 8: Cloud Computing Primer. Available at http://www.interpares.org/ip3/display_file.cfm?doc=ip3_canada_gs12_module_8_july-2012_DRAFT.pdf.

5.3 Burns, H., Higgins, S., et al. (2010). *Business Case for Shared Digital Preservation Provision*. ARCWDP. Letter available from ARCWDP Chair detailing continuing contribution.

5.4 Letter available from ARA Chief Executive detailing contribution.

5.5 Screen-shot available showing *Managing Research Data* ranked number one on Amazon and email detailing sales figures.

5.6 Letter available from DCC Associate Director.

5.7 RDMRose. (2012). *Learning Materials*, Section 3. Available at http://rdmrose.group.shef.ac.uk/?page_id=10#session-3-the-digital-curation-lifecycle

5.8 Information and Records Management Society Conference. Brighton, UK. *ESI: An Episode on Cross Disciplinarity: Legal Admissibility, Digital Forensics and Records and Information Management*. Programme available

5.9 The Recordkeeping Institute. *Recordkeeping Informatics: A Discipline under Construction*. Available at http://recordkeeping.net.au/recordkeeping-informatics/5-the-records-continuum/.

5.10 Digital Preservation Coalition (DPC). *Technology Watch Reports*, ISSN 2048-7916. Recent editions include: Pennock, M. (2013) *Web Archiving*; and Lavoie, B. (2013). *Preservation*

*Metadata*. The full series is available at: http://www.dpconline.org/advice/technology-watch-reports. Letter available from DPC Executive Director detailing contribution and download figures.