



Towards a Global eResearch Service:

Challenges, Benefits & Future Directions

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Agenda

- Overview of SIRCA – An eService Model
- Some distinguishing “enabling” features
- Challenges
- Research impacts
- Innovation Partner example: UNSW eResearch
- Discussion

Acknowledgements:

DEST Systemic Infrastructure Initiative

Reuters International

About SIRCA

Independent Member-based Research Cooperative

- SIRCA is an independent not-for-profit company established in 1997 to facilitate world-class financial services research on behalf of its (now 30) ANZ University Members
- The SIRCA Board comprises a mix of senior industry and academic representatives
- SIRCA is managed by a full-time CEO (Mike Briers seconded from UNSW) and currently directly employs around 32 professional IT management & support staff
- It's innovation centre is located in the Sydney CBD (visitors welcome!!)
- ANZ Universities pay an annual Membership fee

Industry – Academic Partnerships

- Founded on strong industry & government data, research & technology partnerships
- Facilitation of industry-linked research (e.g. National PhD program)

Emergent eResearch Service Provider Model

- Extension of ANZ Member service to international university Subscribers
- Over 350 end-users and growing rapidly

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Data: Global Historical Event Stream

SIRCA specialises in the management of global historical event stream data encompassing financial market, economic and news events captured in real-time from thousands of sources globally.

Key features of the data repository include:

- It is highly granular – time stamped to the milli-second
- It is non repeatable – the time series of unique events cannot be regenerated
- It is unique and extremely valuable – it exists no where else in the world
- It is the largest of its type in the world (over 200 TB) and growing at 30% per annum (capturing up to 100,000 real-time messages per second).
- End user researchers require on-demand searchable access to the complete data repository
- End user demand is very high and growth will continue into the foreseeable future

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SIRCA's eResearch Service Model is End-User Oriented

Four Key eResearch Service Goals:

- Maximise the quality of end-user experiences (better, faster)
- Increase individual and institutional service uptake (more)
- Maintain a pipeline of new service offerings (continuous innovation)
- Create new research agendas and high impact research outcomes (leadership)

Enabled by:

- Independent co-operative not-for-profit company governance & management
- Unique historical global data repositories (financial, economic and news events)
- Secure & resilient storage, test, development and production systems
- Data management and software engineering expertise
- Collaborative end-user and technologist network
- Industry and government partnerships

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Enabler: An agreed strategic plan is vital

THE FRAMEWORK



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Enabler: Operations are dynamically aligned to service provision

	Technology "better & faster"	Applications "more"	Innovation "pipeline"	Research "leadership"
Activities	<ul style="list-style-type: none"> Optimising development, test and production systems Security & access control Software engineering services Data custodianship & curation Quality assurance 	<ul style="list-style-type: none"> Delivery of products and services (on-line & off-line) Marketing and sales Product support & training User consultation & feedback Service contracting 	<ul style="list-style-type: none"> Collaborative R & D IP Management External seed funding Data sourcing & acquisition Agile & creative development 	<ul style="list-style-type: none"> Identify new opportunities for end-user research Engage & support focused end-user research collaboration Industry focused research and consulting
Assets	<ul style="list-style-type: none"> Computing, network & data storage facilities Data & software expertise 	<ul style="list-style-type: none"> Applications Secure & resilient systems Industry & government links Brand & Reputation 	<ul style="list-style-type: none"> Motivated, creative staff Innovation partner network Distributed (internal & external) intellectual property 	<ul style="list-style-type: none"> Research domain knowledge Knowledge of academic environment Industry links
Role	<ul style="list-style-type: none"> To optimise production systems and continuously improve application support & delivery 	<ul style="list-style-type: none"> To develop end-user networks and promote usage of e-research services 	<ul style="list-style-type: none"> To incubate & maintain a pipeline of new applications & products 	<ul style="list-style-type: none"> To motivate leading-edge research around new sources of data & related applications
Competencies	<ul style="list-style-type: none"> Systems design & admin Data management Software engineering Quality assurance & testing Service level management 	<ul style="list-style-type: none"> Marketing & sales Product training & support Data consultation Business development Legal 	<ul style="list-style-type: none"> Ideas generation Agile development Fund raising Legal Commercialisation 	<ul style="list-style-type: none"> Research & publication Research consulting Relationship management
Value is created by:	<ul style="list-style-type: none"> Consistent delivery of high quality user experience 	<ul style="list-style-type: none"> Responsive product training, sales & support 	<ul style="list-style-type: none"> Knowledge sharing, generation of creative solutions & rapid technology transfer 	<ul style="list-style-type: none"> Industry-based research & consulting with tight feedback loop on application development initiatives
Business Goal	<ul style="list-style-type: none"> Maximise the quality of end-user experiences 	<ul style="list-style-type: none"> Increase individual & institutional service uptake 	<ul style="list-style-type: none"> Maintain a pipeline of new service offerings 	<ul style="list-style-type: none"> Create new research agendas & high impact research outcomes

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Challenges: Technology Services – "better & faster"

Secure & Resilient Systems

- Security and access control - Shibboleth enabled access control required by JISC (UK)
- Resilience – fully redundant single site (ac3) - second mirror/DR site being implemented
- 24/7 Systems support – remote system monitoring and alerting
- Data latency (was T+90, now T+7, 2007 target is T+1)
- Optimising system database performance – resisted Oracle type solution
- Broad use of open source – initial resistance from Reuters

Software Engineering Processes

- Separating development, test, and production environments - how different?
- Managing multiple application development paths (formal change control & release process)
- Emergent agile (cf "waterfall") development process – also resisted by Reuters

Quality assurance & testing

- The key to developing production grade applications – but how to resource?
- From developer-based to independent unit, integration & acceptance testing

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Challenges: Application Services – “more”

Support & training

- From local to global reach (on-line, access grid, user conferences, podcasting, remote support etc)
- Staying in tune with broadening user disciplinary base – what are their needs?

Marketing, sales & legal

- “Built by academics for academics” ... and continuously improved!
- Communicating new content & functionality – create some excitement!
- Leveraging academic networks (introductions, research prizes, keeping in touch)
- Managing data provider and jurisdictional legal requirements (e.g. using channel partners like JISC)
- Co-operate or compete?

User consultation & feedback

- Custom off-line data consultation to automated on-line service (e.g workflow mapping)
- Formal requirements specification, road map and prioritisation

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Challenges: Innovation Services – “pipeline”

Innovation Centre

- Idea generation starts where? How far should the innovation network extend?
- Distance from the source of ideas – SIRCA as an independent entity
- Skunk works model? Competitive model?
- IP management & incentives
- Sourcing funding for high risk, long-term projects
- Strengthen and leverage alliances with key data providers
 - from nuisance to value added service provider!
- Commercialisation guidelines – not because we can but only if it benefits core academic e-service
- Collaboration with broader national e-research community!

Managing two cultures

- Production services versus “the sand pit” – control versus creativity
- Gearing for rapid technology transfer – tight feedback loop?

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Challenges: Research Services – “leadership”

Shifting and creating new research directions/paradigms (& future “audience”)

- Motivating academics to change research direction – direct support and first-user-advantage principle
- User-builder relationship management
- Industry links – managing expectations
- Project management & research grant support

New Innovation & Research Projects:

- Real-time event stream capture engine – from T+1 to T+0 !
- Historical and real-time analytics engine – e.g. compliance and risk management research
- News, economic and market data integration – e.g. combinatorial, data mining research
- Text based semantic modeling tools – e.g. sentiment analysis of news

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Research impacts

Academics are becoming vastly more productive:

- Australian academics now regularly publish in the best international journals
- Over 350 ANZ academics and 60 PhD students now use the service
- Research students are more productive and are completing their degree in record time
- Over 500 Research papers have been produced using the service
- Ground breaking research currently in the pipeline limited only by imagination

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Research Impacts (con't)

The financial markets research agenda has expanded:

- From traditional market design work to financial crime, corporate governance, forensic accounting, energy and environmental markets, superannuation and aging, complex systems, data mining, computational linguistics

... and become more multi-disciplinary:

- Academics and students now come from base disciplines in finance, economics, accounting, law, mathematics, physics, engineering, informatics, linguistics, computer science etc

... and a large positive impact on research training and education outcomes:

- More and better prepared PhDs
- Improved quality of undergraduate education

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Innovation Partnerships: UNSW eResearch

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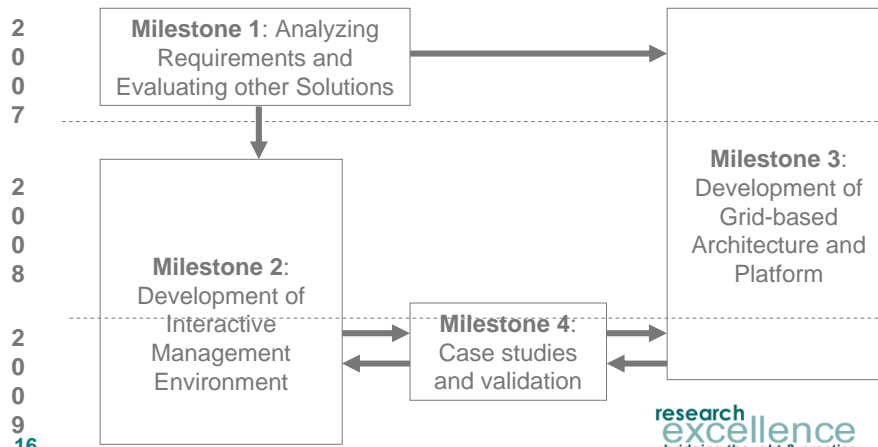
Ad-hoc Data Grid Environments (ADAGE) Project

- DEST-Funded Project (Innovation Science Linkages) 2007-2009. Over \$1M funding received.
- Involves researchers at UNSW, University of Sydney and several European Universities
- Aims of the project: develop tools and techniques for storing, managing and processing ad-hoc data grids
- Ad-hoc data grids
 - Huge repositories of heterogeneous data resources
 - Data has inconsistencies and gaps
- Addressing the needs of a wide range of user communities
- SIRCA's is providing main case studies for this project
 - Datasets (News and Trading Transactions)
 - User communities (Industry, Reuters, Academic etc.)
- Other datasets will be used (e-health, Web logs)

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ADAGE Project Milestones



UNSW Centre for e-Research and Services Engineering CeRSE)

- Supports three main research areas
 - Services engineering: software as a service, ubiquitous service computing, service delivery and management
 - Intelligent Information Discovery and Analysis: processing large information repositories, databases, web sites, blogs etc.
 - Transforming Services Access and Sharing: integrating user productivity tools (spreadsheets for business analysts, MATLAB for mathematics etc.) with underlying software environments
- Builds on
 - Service-Oriented Computing Research Group (Faculty of Engineering)
 - FinanceIT Research Group (Faculty of Business)
 - Asia-Pacific ubiquitous Health Centre (APuHC)
 - DEST-funded ADAGE Project, Smart Services CRC

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CeRSE Application areas

- CeRSE will have a strong application focus
- Partnership with established domain specific research centres (e.g. SIRCA)
- From e-research services to research e-services

Finance	e-Health	e-Government	e-Learning	e-Science	Smart Services
Transforming Services Access and Sharing					
Services Engineering					
Intelligent Information Discovery and Analysis					

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Q & A

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