The Value of Research Data to the Nation

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This paper explores the meanings of value in relation to research data. Value explains why we put effort and investment into research data and why we would want to share research data. Rather than provide a list of pros and cons for sharing data, which has been covered many times elsewhere [1][2], this paper explores the nature of value itself in relation to research data. Why explore value? Value explains or uncovers why we do what we do, and its complex, multi-dimensional nature goes some way towards explaining why for instance the pros and cons of sharing research data are such a complex discussion.

A value approach extends current ways to assess the economics of sharing data, such as cost-benefit analysis. A value approach takes a broader view than only financial assessments, so has potential to analyse and assess public projects for which there is no market for services. Revenue generated and takeover price are indicators of value created in the private sector. But such information is not available for public sector investments of the type made for research data specifically and research infrastructure more generally. This paper discusses a value approach, and applies the approach in a research data context.

VALUE IS A COMPLEX MULTI-DIMENSIONAL ASSESSMENT

Key takeaways from a value approach:
- value is a complex, multi-dimensional assessment, including intangible inputs and outputs
  1. Value as tangible cost-benefit [3]
  2. Value as novelty (including transformative novelty, such as 4th generation data-driven science [4]
  3. Value as community (including rules of groups, such as ARC funding rules on data management planning), following international trends in data management, open data, open access
  4. Value as simple, easy, convenient, quicker and conversely slower, or more requirements
  5. Other types of value
- value since it includes intangibles cannot be measured in dollars alone [5]
- value is dependent on audience, so national value requires aggregating across affected audiences; researchers, institutions, funders, government, public sector and community.

AGGREGATING VALUE: VALUE IS NOT MEASURED IN DOLLARS ALONE

The value of research data to the nation is the aggregate of all these types of value across all the beneficiaries of the uses and infrastructure of research data. This should be offset by all those negatively impacted by loss of value, such as loss of time for research compliance. Gross Domestic Product is such an aggregate using all the tangible cashflows of the nation; investments, sales, purchases, capital expenditure, exports, imports. Value has no common currency like dollars, but can be measured in other ways through such indicators as satisfaction. Suggestions will be made for measuring value overall both by audience and for the nation.

METHODOLOGY

I examined Research Data related documents to identify comments relating to value. These documents included high level Australian and International policy documents on the research infrastructure, open data and data sharing, which document rationales for investing in research infrastructure and open data, statements by funders both Australian and International, and the recent report of the Commission of Audit. My review is informed by my PhD research [6] which examined how consumers understand value in 3G smartphones.

Table 1: Value as tangible and intangible in relation to Research Data

	Tangible	Intangible
Inputs	Investment in grants, ANDS and other research infrastructure initiatives, co-contribution to ANDS projects	Unpaid effort invested or overtime
Outputs	see below	see below

Intangible Outputs: These include: greater citations, new problems, Australian international reputation (place on Research Data Alliance Council), new better relationships (ANDS Research Data Community events, connecting researchers with overseas colleagues), skills (metadata, minting DOIs, data management policy, planning; ANDS seminars).

Tangible Outputs: These include the Research Data Commons, Software tools, Website.

Table 2: Examples of value beyond tangible cost-benefit found in policy documents

Type of value	Example
Novelty (transformative)	4th Gen data-driven research: UK Biobank [4]
Community	ANDS role in Research Data Alliance
Simple, easy, convenient	Online data storage and access
Other types of value	For instance, service and reliability of storage

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ABOUT THE AUTHOR(S)

Dr Richard Ferrers is a Research Data Specialist at ANDS Melbourne Office, Monash Caulfield. Richard works in the ANDS Institutional Engagement team partly on community building through national Data Management Clinics and Regional Informal get togethers, whilst supporting several Institutions to reach their data management objectives, including University of Melboure, RMIT, Swinburne University of Technology, University of Tasmania, Federation University and Charles Darwin University. Richard has a particular interest in data visualization, data licensing and intellectual property issues, and from his PhD research, innovation and its relation to value creation and science & technology public policy. Richard blogs at: http://valman.blogspot.com about value and innovation and is visible on twitter at: @valuemgmt.

My perspective of value is heavily influenced by my research into how and why consumers adopt 3G smartphones, which was the topic of my PhD in innovation and technology management (UQ Business School), and the comparison of a value perspective with national and international policy inquiries on how to measure innovation (US Dept of Commerce [6]), how to encourage transition to clean energy (Garnaut Review [6]), and how and why to implement the National Broadband Network (McKinsey Report [6]).