

Review into Open Banking in Australia – Comments on Final Report

Submissions should be lodged with data@treasury.gov.au by 23 March 2018.

Content of submission

- Existing academia-industry network in Fintech – overview and capability
- Some specific comments on some of the recommendations
- Suggestions for greater academic involvement

Existing academia-industry network in Fintech – overview and capability

Australia has a strong network of academic researchers working in multidisciplinary areas around Technology-Driven Financial Innovation and Financial Software Systems. Through several research projects (publications sample in Appendix), members of the network have collaborated with each other and built strong connections with industry and various international partners, with substantial contribution to wide range of related standards activities, within standards development organisations such as ISO, OMG, OASIS and HL7. Most of these collaborations have originated from initiatives destined to strengthen academic-industry collaboration such as CRC for Enterprise Distributed Systems, Capital Markets Cooperative Research Centre and Smarts Services Cooperative Research Centre. The authors of this document have all been working across academia and industry and participated in different projects under various roles.

We believe that Universities with their large research and education base and with the help of government should help grow the Open Banking sector and **actively participate** in the proposed Open Banking Initiative.

According to a recent article (see <https://www.criterionconferences.com/blog/socialtech/fintech-ecosystem-innovation-disruption-collaboration/>) :

The academia's collaboration with the Fintech ecosystem is occurring through several streams. The Entrepreneurship, Finance and banking, IT and Communications disciplines are supplying the founders of Fintech startups. Universities and centres are providing mentoring programs and boot camps, sponsoring student-led Fintech clubs and allowing the use of their campus spaces for Fintech meets and events. Academic research is evolving around data analytics, cybercrime and fraud protection, network analysis and Fintech business models with new academic and practitioner journals being founded for disseminating the research. Technology companies in turn are partnering with Universities by setting up Chairs focused on expertise in finance, digital technologies and entrepreneurship to facilitate the rapid and smooth knowledge transfer and commercialization of academic research.

In particular, the network can play a key role in the **education aspects** of the open-banking initiative. As the proposal contains several fundamental changes, it is likely to encounter strong resistance as the UK experience is showing. These could be effectively addressed through educational activities. As an example with a similar ecommerce initiative, Australia introduced superstream for employers to automated payroll from paper-based, this was resisted until various education initiatives helped organisations with adoption of the new practices. Addressing educational aspects very early on during the development of the standard will facilitate its adoption. One practical suggestion would be getting involved in the Open Banking APIs Gateway (openbankingapis.io) or creating something similar in Australia.

Comments on specific recommendations

Section 2 (Recommendation 2.6)

The proposed Data Standards Body could benefit from an active role by the University sector. The network has a lot of experience in methodologies for developing standards demonstrated in:

- Application of eBOM methodology (used by ATO for SBR)
- Involvement in the development standards for industry groups such as ISO20022, swimEC, FIX, Superstream and SBR
- The recent ISO Enterprise Language specification (ISO/IEC 15414) as part of Reference Model for Open Distributed Processing standard, with precise expression of enterprise policies such as privacy, permissions, obligations, rights, accountability and compliance, needed to support computational integrity in cross-enterprise environment and thus the expression of consumer data rights (CDR)
- Experience in supporting the existing and emerging standards related to privacy protection, such as the existing Australian Privacy Act, the existing US HIPAA (Health Insurance Portability and Accountability Act), and the new European Union General Data Protection Regulation (the GDPR)

This capability can be made available to the Data Standards Body for the elaboration of the recommended standard, helping to ensure that there is no bias towards any particular organisation or vendor.

Section 3 (Recommendation 3.2)

Recommendation 3.2 states:

“The obligation should apply for the period that data holders are otherwise required to retain records under existing regulations. Table 3.1 describes the list of accounts and other products to which this obligation should apply.”

We recommend that given Open Banking will become a legislated requirement to provide data, it should also be explicit on a minimum period (e.g. 2 years) of which data should be retained applicable to both the duration of the history of transactional data as well as the period of which data should be held after a customer has ceased their relationship with a particular ADI. The minimum period should be a duration that will meet foreseeable uses of historical data by industry participants within open data.

Under this scenario, Open Banking will become one source of an ADI's data retention obligations on top of existing rules, this period may be less than the mandated retention periods applicable as part of AML obligations but should be standardised across all types of data as this will reduce confusion as well as the burden on the data holders to act as a host for historical data.

We further recommend that there should be a specified requirement regarding the timeliness of data provided by ADI's should be agreed, the recommended period should be as of the previous business end of day.

Section 5 (Recommendations 5.2 and 5.3)

Section 5 of the Review into Open Banking - December 2017 addresses data transfer including

- what information or meaning needs to be conveyed
- how that information is encoded
- how it can be found, requested and transported
- what information or meaning needs to be conveyed

Open Banking requires the communication of Information related to Financial Transactions and Financial Instruments including:

- Transactions
- Transfers
- Payments
- Investments and Securities (Portfolios)

To efficiently achieve this goal over an extended period, and to minimise ambiguity and error, we need a reference model to describe the information. Such a model must support publication, interpretation and translation of data.

A Model based on sound theoretical principles is required. The model should be consistent with the design principle that it be open to extension yet closed to change. New concepts can then be added without requiring structural changes, thereby minimising the costs associated with incorporation of new data or changes to data.

Knowledge sharing enables people to communicate and interact with each other efficiently. Semantic technologies have developed rapidly in the last past years and continue to grow as the importance of knowledge and technologies working together and are an important tool for expressing knowledge domains.

In Relational databases and other modelling paradigms such as XML or JSON , the relationship between data organised in different tables or message structures is acknowledged, but the nature of that relationship is not explicit in the model. The implementation requires logic that is embedded in code that imports to and exports data from the data model.

Semantic models explicitly include the nature of the relationships between concepts. The model is therefore richer in content, thereby reducing the amount and complex code required to consume and store data.

Semantic models are primarily based on a simple “Triple”. The triple is a 3 part structure composed of;

- Subject (Noun)
- Predicate (Verb)
- Object (Noun)

examples are:

Person_(subject) is Identified by_(predicate) Name_(object)

Name_(subject) identifies_(predicate) Person_(object)

With the inclusion of cardinality of Noun Concepts, we can build a rich model of a knowledge domain (an Ontology). It implements a set of First Order Logic assertions.

When implemented in OWL (Web Ontology Language), the statements effectively specify a directed graph which can be used to make inferences about the relationships between the conceptual things represented in the ontology.

More importantly, it is possible to execute a reasoner to expose otherwise obscure relationships. This enables rigorous testing of the logic.

Whilst a relative new discipline a number of ontologies have been written to model Financial instruments and financial transactions.

Given the existence of several Ontologies in the financial domain, including but not limited to:

- FIBO;
- BIAN; and
- ACTUS:

A governance and research body can guide the independent development of an appropriate ontology to support Open Banking as well as knowledge domains outside the Financial Industry

REA (see <http://wiki.c2.com/?ResourceEventAgent>) is an academically rigorous ontology. Based on 3 fundamental Concepts:

- Resource
- Event
- Agent

It, further, defines concepts of:

- Commitment
- Agreement.

The Enterprise Data Modelling Council in Washington DC, In conjunction with the Object Management Group, are developing FIBO (Financial Industry Business Ontology) to meet the needs of the Finance Industry. FIBO is built on the REA model, developed at Michigan State University.

These concepts form an ontological framework upon which we can build an ontology that can represent any financial Instrument or transaction.

The use of semantic modelling has already been trialled during the SBR standard development exercise, report attached (it is listed in <http://www.sbr.gov.au/about-sbr/news/reports/digital-transformation-sbr-strategic-reports>). Some authors of this document have also done a study on the use of semantic modelling techniques for regulatory reporting (attached).

Suggestions for greater academic involvement

The main suggestion in this response is to create an academic-industry network specifically aimed at supporting the area of Open Banking in the following areas that are not necessarily for profit, but can be used in fostering the existing, and developing new ecosystem in FinTech and RegTech, promoting competition and innovation:

- Conducting multi-disciplinary research projects that consider the barriers related to Open Banking. These projects would be considered of little value for industry but many university research groups would be keen to address them as part of their drive for enhancing industry collaboration.
- Developing innovative products that are made freely available such as financial planning tools, personalized banking hubs, including experimenting with links with related technologies such as blockchain/distributed ledger, analytics, machine learning and AI
- Dealing with educational issues, developing products for financial literacy and encouraging financial inclusion in a way that would benefit disadvantaged communities and the entire society
- Encouraging openness, transparency and compliance with rules and regulations

There are many ways to support such a network e.g.:

- As a Cooperative Research Centre (<https://www.business.gov.au/assistance/cooperative-research-centres-programme>), in a similar way to Data 2 Decisions Cooperative Research Centre <https://www.d2dcrc.com.au/> which addresses the needs of the Australian law enforcement and defense agencies.
- As a specific initiative, similar to Landcom's Communities of Practices (<http://www.landcom.com.au/approach/collaborative-learning/universities/>) which supports academic involvement of NSW Government's Smarts Cities initiative

About the authors

Fethi Rabhi is a Professor in the School of Computer Science and Engineering at the University of New South Wales (UNSW) in Australia. His main research areas are in service-oriented software engineering with a strong focus on business and financial applications. He completed a PhD in Computer Science at the University of Sheffield in 1990 and held several academic appointments in the USA and the UK before joining UNSW in 2000. He is currently actively involved in several research projects in the area of large-scale news and financial market data analysis.

Max Gillmore is an experienced data architect specialising in Banking and Finance. He has more than 20 years experience in Banking at ANZ and NAB and Over 35 years experience in Australian financial markets. He currently works with the Washington D.C. based Enterprise Data Modelling Council on the development of FIBO (Financial Industry Business Ontology) and with The Carmarthen Group, a group of Consultants specialising in Knowledge Management in the Finance Industry.

Terry Roach is the Founder and CEO of Capsifi, an Australian software company with a semantic modelling platform for developing interactive business models. Terry was awarded his PhD in 2011 from UNSW for his thesis which defined an ontology framework for the development of semantic business models. He subsequently managed the implementation of a semantic business architecture for APRA, the Australian financial regulator. Capsifi has provided consulting advice on the development of information architecture principles for the Standardised Business Reporting initiative of the Australian Tax Office.

Zoran Milosevic is a co-founder and director of Australian ICT consulting/software company Deontik. He is a specialist IT architect, with combined strategic research and hands-on skills in digital business and digital health – including enterprise, solution and information architecture, information management, interoperability, process and enterprise/security policy, business contracts and real-time analytics. Recent work adds the focus on data science, machine learning, artificial intelligence, blockchain and smart contracts and cyber-security. Zoran has over 20 years of experience working in a variety of complex environments spanning consulting, services, research, standardization and software development. He is the founder of the well-respected IEEE Enterprise Distributed Computing conference (EDOC) series, now in the 22st year.

Alan Hsiao is an experienced consultant with prior experience within global consultancies and has held a senior data strategy role within one of Australia's major banks. He has experience and understanding of developing banking use cases for data and analytics, data models and underlying systems architecture within Banks relating to enterprise-wide data & analytics ecosystems. Alan is the founder of Cognitivo Consulting, a boutique Data and Information Management advisory firms, focused on helping Australia companies particularly within Financial Services build relevant strategies, organisations, ways of working, governance and technical assets required to deliver customer and business value through data-driven solutions. Alan also works with UNSW on advanced data science and machine learning research relating to applications and uses of financial transactional data.

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Appendix: List of research publications in Service Design and Innovation in Financial Services

- A. Behnaz, F.A. Rabhi and M. Peat, RoboAdvice: Issues and Challenges, (under preparation).
- F.T. Dabous and F.A. Rabhi, Information Systems and IT Architectures for Securities Trading, D. Seese, C. Weinhardt and F. Schlottmann (eds), Handbook on Information Technology in Finance, Volume 1, Springer, ISBN 978-3-540-49486-7, 2008, pp. 29-50.
- F.T. Dabous and F.A. Rabhi, A Framework for Evaluating Alternative Architectures and its Application to Financial Business Processes, In J. Han and M. Staples (eds), Proceedings of the 2006 Australian Software Engineering Conference (ASWEC 2006), 18-21 April 2006, Sydney, pp. 122-131.
- F.A. Rabhi, H. Yu, F.T. Dabous and S. Wu, A Service-Oriented Architecture for Financial Business Processes, Information Systems and e-Business Management, Vol. 5, no 2, March 2007, pp. 185-200, ISSN: 1617-9846.
- F.T. Dabous, F.A. Rabhi and H. Yu, Performance Issues in Integrating a Capital Market Surveillance System Using Web Services, In Web Information Systems Engineering (WISE) Conference, T. Catarci, M. Mecella, J. Mylopoulos and M.E. Orłowska (eds.), Italy, December 2003, IEEE, pp. 287-290.
- F.A. Rabhi, F.T. Dabous, H. Yu, B. Benatallah and Y.K. Lee, A Case Study in Developing Web Services for Capital Markets, In Proc. IEEE International Conference on e-Technology, e-Commerce and e-Service, S.T. Yuan and J. Liu (eds), Taipei, Taiwan, March 2004, IEEE Press, ISBN 0-7695-2073-1, pp. 38-41.
- H. Yu, F.A. Rabhi and F.T. Dabous, An Exchange Service for Financial Markets, Proc. 6th International Conference on Enterprise Information Systems, Portugal, 14-17 April 2004, pp. 403-410.
- F.A. Rabhi and B. Benatallah, A Service-Based Architecture for Capital Markets Systems, Vol 16, no 1, IEEE Network, 2002, pp. 15-19.