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Third Party Data Service Providers Can Enhance Patient-Provider Interactions: Insights from an Open Banking Delphi Study

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ABSTRACT
Data sharing between financial services organisations has led to a proliferation of third party data service providers that are not parties to transactions but facilitate interactions between them by analysing, manipulating or storing data related to transactions. This has led to widespread legal, technological and sociocultural changes in that sector broadly described as Open-Banking initiatives. Third party service providers have not emerged in the healthcare sector in the same way. This study reports preliminary results of a Delphi study comprising healthcare and financial experts to explore the extent to which third party providers in healthcare is beneficial and feasible. Ensuring the quality of data service provided by third parties was seen to be a critical success factor. A causal loop model was used to describe the inter-dependent factors underpinning this factor. Further investigations to augment the model with Consumer Data Rights and validate empirically are underway.

CCS CONCEPTS
• Applied computing → Health informatics.

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1 INTRODUCTION
In the financial sector, providers known as third parties\textsuperscript{1}, often intervene between first parties (e.g., customers) and second parties (e.g., vendors) to manipulate data to facilitate the first-second party interactions. A common example of a third-party is an online payment provider (e.g., Paypal, eftpos in Australia) that will confirm the customers balance through Application Programmable Interfaces (APIs) into the customer’s bank account, and initiate a transfer to the vendor’s bank.

The movement that enables third-party providers to access data owned and stored in banks is known as Open-Banking (OB). The authors in [11] describe open banking as growing rapidly and currently available in 87% of the world’s countries. The benefits of the OB include, but are not limited to, improved customer experience, new business and revenue streams, wider collaborations between banking and traditional financial institutions, new customer focused and sustainable financial business service models for underserved markets, stimulating competition among the banks and service providers for creating customer focus holistic products and platforms to name a few.

The OB stimulates the emergence of third-party providers that provide new services such as aggregating accounts from different banks, displaying dashboards that present analysis of spendings, credit ratings, and many other services yet to be imagined. OB requires consumer data rights to be specified and enshrined in new legislation, standards for API’s and a shift in the self-perception of

\textsuperscript{1}As defined in the legal dictionary [21], "a third party is a person or an entity that is not a [direct] party to a contract or transaction, but has an involvement (such as a buyer from one of the parties, was present when the agreement was signed, or made an offer that was rejected). Generally, a third party entity has no legal rights in the transaction/matter, unless the contract was made for the third party’s benefit."
banks from closed custodians of customers funds to open suppliers of customer data to many third-parties.

Figure 1 illustrates the prospects for the emergence of third-parties that provide services with health data for patients (first-party) and healthcare providers (second-party) were raised by authors in [20].

Currently, only a few third-party providers exist in healthcare. Notable exceptions include automated medical scripts [22], and some electronic health records systems (e.g., Apple Health App\(^2\)). However, as healthcare data continues to be collected and stored, third-party providers that process, store or analyses the data can be expected to become increasingly prevalent, prompting pressure for the healthcare sector to adopt an OB style ecosystem [20]. However, the extent to which this is feasible or even beneficial has not been studied.

This paper reports preliminary findings and analyses from a Delphi study comprising experts in OB and other experts in EHR to solicit views on the extent to which an OB ecosystem can be envisaged for the healthcare sector. The next section provides further background into OB and EHR. Following that, the Delphi methodology is described before reporting and discussing some preliminary findings. The paper is concluded with some remarks and pointers for future work.

2 CDR, TTP, OB AND EHR

The Australian Consumer Data Right (CDR) describes rights and obligations associated with the transfer of personal data, collected by banking, energy and telecommunications sectors within a mandated Application Programming Interface (API) standard framework and ecosystem [3, 8]. Within the financial services sector the CDR ecosystem is dubbed Open-Banking (OB). An OB represents emerging financial services business models that focuses on the portability and open availability of the customers and their transactional data [1].

The Australian CDR includes bank accounts, mortgages, loans, insurances and many new financial services [5, 6] but will also extend to the energy and telecom sectors [2] to help consumers get the most competitive services.

As CDR matures in the financial services, telco, and energy sectors and third party providers proliferate there, the question arises regarding the extent to which this trend may extend to healthcare. The emergence of third party providers and new Apps like the new Apple Health App that enables iPhone consumers to share their EHR with healthcare providers in the US might trigger a data sharing revolution in healthcare is open [23]. Although there may be arguments that patients do not want to share their health records, Kim and colleagues [10] found that patients are willing to share data and bio-specimens for research and that researchers’ affiliations, the design of consent forms, and patient age and health literacy are all linked with patient’s sharing decisions.

3 THIRD PARTY SERVICE DATA PROVIDERS IN THE OPEN BANKING ECOSYSTEM

OB aims to enable consumers to share their financial data between their financial institution and third-party providers (and between financial institutions), typically through the use of APIs [1] so that they are empowered to seek out financial products better suited to their needs and creates opportunities for competitors to innovate appropriate products for the market. They do so by submitting requests that include account data and payment instruction onto Third-Party Providers (TPPs) to replace traditional payments methods like credit or debit cards [5].

The TPPs, as intermediaries between merchants and customers incorporate multiple payment approaches with different financial institutions cards into an integrated interface for faster and convenient e-commerce [4]. The New Payments Platform (NPP) launched in February 2020 was cooperatively developed by Australian financial institutions to provide a modern payments infrastructure for the country’s banking system.\(^3\) Banks must give access to any fintech that requests data on behalf of the consumer [15].

An OB leads to the creation of many new innovative businesses, especially third-party providers of financial services [5]. OB is a data sharing initiative to enable information flow between entities [14], including TPPs. Customers having greater access to and control over their banking data, hence greater choice in their banking service providers and convenience in managing their money [12] to improve their quality of life and efficiently participate in shopping using technology [7]. Consumers and businesses can choose which TPPs to share data with for their benefit, effectively putting the end user in control of their data [9]. Thus, OB is opening competing banking and payment services in the market increasing the variety of banking services [6], and enhancing competition in the financial service sector will lead to more effective price and service comparison shopping and make switching from one service provider to another easier [5].

Nicholls [5] claims it even possibly improves financial literacy, prevents exploitation of vulnerable consumers, and might close the gap of 2 billion individuals without a bank account. Further, real-time monitoring and auditing, automated financial reporting, and non-compliance detection should improve and thus increase transparency [24].

4 RESEARCH METHODOLOGY

This study used the Delphi technique originally proposed by Linestone et al. [13] to identify the benefits and barriers associated with an OB style electronic health record ecosystem. After identifying six experts, three with OB and three with EHR expertise the sample settled with four respondents split equally between OB and EHR expertise.\(^4\) OB and EHR experts were identified and sampled via the researchers’ network of connections in OB and EHR via scholarly conferences, LinkedIn, and emails. Names of the participants were not shared between them. No priori definition of “consensus” about whether an outcome should be measured was established by the researchers. Non-responders were invited to subsequent rounds. Two rounds of Delphi consultations were conducted.

\(^2\)https://www.apple.com/au/ios/health/

\(^3\)While the sample size of the Delphi respondents is relatively small, we see this as a limitation at least at this stage. However, as we report the preliminary results of the work, this might not be a limitation in future because we have planned further Delphi consultations rounds with more respondents from OB and EHR domains.
During the first Delphi consultations four respondents of six invitees completed a semi-structured survey asking them to identify the barriers and benefits of data sharing using an OB model for EHR, which they accessed individually and anonymously via an email link to Qualtrics survey tool (https://www.qualtrics.com/). At the start of the first round, the EHR expert participants were provided with an information sheet summarising the OB concepts. The OB expert participants were provided a summary of EHRs. After analysing the results of the first Delphi consultations, the second round comprising three respondents of six invitees answered the open-ended question: how feasible is an OB model for EHR? At the start of the second Delphi consultations the invitees were provided OB and EHR Delphi Round 1’s Summary of findings. One OB expert declined to contribute after discussing this internally, because at this point, they decided they would not like to participate in this consultation. The EHR expert who did not participate because they could only contribute later, which was after the closing date for data collection.

5 DELPHI SURVEY RESULTS AND DISCUSSION

During Delphi consultations round one, the four experts considered the OB-EHR benefits to consumer or patient, the healthcare provider, and the Healthcare system. The main benefits to consumers or patients were that it can facilitate the sharing of medical information with a third-party and engenders patients (as consumers) to trust systems that protect their health data. Healthcare providers felt it enables medical information to be shared with other healthcare providers. To the healthcare system it can stimulate businesses to create value for patients by processing their health data.

However, these benefits to OB-EHR were overshadowed by perceived technical and systems barriers. The need to ensure data privacy, confidentiality and security makes technical implementation challenging according to the responses. Patients and providers perceived trust issues in an OB-EHR system, and how OB-EHR is communicated to encourage change is problematic, but not impossible. Reforming the existing EHR is challenging because it is a political issue according to respondents. EHR has cost so much already, notwithstanding that convincing the public to accept change is difficult. Where funding for OB-EHR will be sourced is unclear too. Furthermore, there is no one to argue the case for a change. This differs from the fintech industry where consumers demand for new services and competition from global IT companies such as Google drives the relatively conservative banking industry to change towards OB [19].

Another barrier is the accreditation requirements and the need to change the current legislation. Therefore, the impact of OB within the EHR ecosystem has been low. Furthermore, the EHRs impact overall has been low. Consequently, mainly because there are no guidelines or frameworks designed to apply OB protocols to EHRs. In other words, there are no guiding principles and/or frameworks designed to apply OB protocol to EHRs. Banking data and health data are very different. OB is one data stream within the CDR. As are Open Energy, and Open Telco, which are the next data streams slated to be launched under CDR. EHRs, or Open Health, is considered another data stream to fit within that. The CDR has a structure that would be applicable to EHR in that, it is consumer centric from a consent perspective, with the ability for consumers to manage multiple consents, including withdrawing consent, at any time. The CDR also regulates who has access to that data, for how long, and in what capacity. Enabling different levels of data access, and accountability at all stages for data security. The OB also applies industry wide data structures that enables ease of sharing and dissemination of data points.

Some sample respondents’ comments are:

Respondent C [OB expert]

“...the only things that should change for EHR are the CDS (consumer data standards), governed by the DSB (Data Standard Body). Even for energy, the infosec and standards designed for banking are adopted for energy unsurprisingly (see V4 of the Rules) with only adding changes for a third-party gateway like AEMO (Australian Energy Market Operator). They don’t want to and should not reinvent the wheel for each industry.

It is the view EHR designated as part of the CDR is a very low priority considering there is portability and lower barriers to transfer of data now with My Health Record. Whereas there are no or difficult channels of sharing one’s own data for other industries.”

Respondent D [OB expert]

“Treasury have started talking about sources of government data which could be suitable for CDR, so EHR does seem to be on their long-term roadmap. Uncertain whether this would include health records per se, however certain types of government led health data like vaccination records could draw a clear consumer benefit in being available and manageable under the Consumer Data Right.”

Respondent E [EHR Expert]

“Consumers/patients are quite closed when it comes to healthcare data. Whilst it is almost socially accepted to discuss finance with strangers, we never really speak about healthcare in the same way. Healthcare data is different from financial and other data as the content held in healthcare data is broader than what is held in financial data. A breach of healthcare data can cause irreparable damage to consumer/patient; it’s not like getting a replacement credit card number.

The legislation and security infrastructure required for an open banking/electronic health record system is non-existent. A lot of work would have to be done in this area before such a system could be feasible. But who would drive this?”

The OB experts were more optimistic about prospects for the health sector of an OB style ecosystem motivated by CDR than EHR experts. However, two themes emerging from both groups were that the landscape is complex and there were many factors that ultimately will challenge the quality of data services health sector third parties might provide.
The Causal Loop diagrams first introduced by Maruyama [16] to model interrelations between inter-dependent factors in complex systems, were adopted to model the complexity. Figure 2 illustrates a causal loop diagram that describes the causal inter-dependence of factors as they impact on the quality of data services a TPPs might provide in the health sector. Following the value proposition of shared decision making among the patient-provider presented by Osop and Sahama [17], the system thinking approach [18] implemented was depicted in Figure 2 enhanced the findings. The predominant [+] polarity signifies a positive causal effect and the [-] polarity represents an inhibitory effect. We see from Figure 2 that factors that impact on the data services include data quality factors such as the reliability and relevance, the completeness and timeliness of data. The quality of infrastructure (software and hardware) impacts on these but also on the protection of confidentiality and data integrity. Prominent in the inter-dependent factors is compliance with, and the existence of, regulations and standards. In contrast, the regulations and standards influence the improvement of infrastructure quality.

6 CONCLUSIONS

The main benefits to an OB-EHR ecosystem overall seems to be mainly ascribed to the patients or consumers by both groups of experts. Despite benefiting from data sharing between healthcare providers, healthcare providers are more concerned about the problems related to medical data sharing. Specifically, the deficiencies in legal and security infrastructure required for an OB-EHR ecosystem when internal data sharing systems within the same health service is not working. Healthcare providers are more open to have medical information shared with other healthcare providers, than giving control over to patients or customers to process their health data. The main reason cited is it is customers or patients do not find it socially acceptable to discuss their medical data, notwithstanding that they are not interested in managing their own health data.

To the contrary, OB experts see no problem with using CDR within the health sector with their own CDS (consumer data standard), governed by the DSB (data standard body). Especially as it leverages the same architecture for information, security principles, consent flows, consent logs, processes, accreditation, regulations, rules, and data standards. Further Delphi consultations rounds are planned to answer the question: how feasible is an OB model for EHR? Besides, further studies are planned to validate the causal loop diagram with emphasis on data-sharing value proposition.

REFERENCES

