**DATABYTES PRIVACY PRESERVING TECHNOLOGY PROJECT – T3 2023**

**Executive Summary**

During November and December 2023, the Databytes privacy technology team conducted a deep dive into privacy preserving technology and its application in the field of financial intelligence. The team conducted a literature review, policy, market, and technology research. It produced reports into the current policy and legal environment for financial intelligence, potential customers and use cases, and the relative advantages and disadvantages of existing privacy preserving technologies.

In addition to research and reports, the team produced multiple tools to create, test and demonstrate privacy technology using synthetic datasets. These tools are [available in GitHub](https://github.com/DataBytes-Organisation/Privacy-Technologies-for-Financial-Intelligence).

The team’s research, tests and findings have shaped three recommendations which are presented below for the board to consider. Investing company resources based on these recommendations represents the best chance of success for future Databytes’ privacy technology products, based on market demand, current technology, and the skillsets of our employees.

**The policy and legal environment** – the team produced one presentation and one report. The [presentation](https://deakin365.sharepoint.com/sites/DataBytes2/Shared%20Documents/New%20Discovery%20Project%20-%20Privacy%20Technology/Recordings/Meeting%20in%20_New%20Discovery%20Project%20-%20Privacy%20Technology_-20231116_190438-Meeting%20Recording.mp4?web=1) details the general policy and legal landscape for financial intelligence, with a focus on the Australian environment. The [report](https://deakin365.sharepoint.com/:w:/r/sites/DataBytes2/Shared%20Documents/Privacy%20Technologies%20for%20Financial%20Intelligence/Research%20reports/Report_GDPR_FIU.docx?d=w30e748e0e5af497f9000bed77ee2216f&csf=1&web=1&e=FqM1af) examines the European Union’s General Data Protection Regulation (GDPR) and its impact on global privacy regulation and technology.

**Customer descriptions** – a [report](https://deakin365.sharepoint.com/:w:/r/sites/DataBytes2/Shared%20Documents/Privacy%20Technologies%20for%20Financial%20Intelligence/Research%20reports/Customer%20Descriptions.docx?d=w1d77a189fd5742debba05473944572f6&csf=1&web=1&e=mpTsR3) detailing disparate customer groups requiring financial intelligence technology solutions. These descriptions use the agile practice of developing using stories and epics to define requirements and focus work.

**Use cases** – a [report](https://deakin365.sharepoint.com/sites/DataBytes2/_layouts/15/Doc.aspx?sourcedoc=%7B94FAB2A3-A50A-42DD-B8B9-8C6BA17CC67F%7D&file=Overall%20Document%20-%20PET%20Use%20Case%20Discussion.docx&action=default&mobileredirect=true) using three different methodologies to examine different financial intelligence use cases. These use cases and the discussions they generated shaped the teams’ final recommendations for the next stage of Databytes’ privacy preserving technology project.

**Technologies** – four separate reports detailing current privacy preserving technologies, including: [homomorphic encryption](https://deakin365.sharepoint.com/sites/DataBytes2/_layouts/15/Doc.aspx?sourcedoc=%7BFED2F424-FFC3-4D5B-A36D-8EE93556714C%7D&file=Homomorphic%20Encryption.docx&action=default&mobileredirect=true), [differential privacy](https://deakin365.sharepoint.com/sites/DataBytes2/_layouts/15/Doc.aspx?sourcedoc=%7B65F7D49C-6340-465A-A522-70FCEE80115B%7D&file=Differential%20privacy%20report%20[DRAFT].docx&action=default&mobileredirect=true&DefaultItemOpen=1), [secure multi-party computing](https://deakin365.sharepoint.com/sites/DataBytes2/_layouts/15/Doc.aspx?sourcedoc=%7BF9525B4C-8213-40ED-8F00-26D26416038E%7D&file=Secure%20Multiparty%20Computation.docx&action=default&mobileredirect=true), and [federated learning](https://deakin365.sharepoint.com/:b:/r/sites/DataBytes2/Shared%20Documents/Privacy%20Technologies%20for%20Financial%20Intelligence/Research%20reports/Research%20Report-FL.pdf?csf=1&web=1&e=Hpz4dE). Each report explains the technology, its application to financial intelligence, and its relative advantages and disadvantages.

**Recommendations for T1 2024**

1. Investigate and demonstrate the feasibility of an identifier/list comparison service using homomorphic encryption.
   1. Compare this service with the performance of both unencrypted and hashed comparison services as benchmarks.
2. Investigate and demonstrate the feasibility of a financial intelligence sharing service using secure multi-party computing technology, with a trusted intermediary acting as a broker.
   1. Compare this service with the performance of an unencrypted information sharing platform.
3. Investigate and demonstrate the feasibility of federated learning as a shared machine learning model development platform for anomaly detection within financial data.
   1. Compare the performance of models trained using varied datasets in isolation, versus models generated by a federated learning approach.