Asia Tech x Singapore 2023 Roundtable on Privacy Enhancing Technologies

Report on Key Insights

1. A year since the inaugural Privacy Enhancing Technologies or PET roundtable, IMDA organised a bigger and wider group of partners to deliberate lessons learnt from the 'PET Sandbox' program. More than 20 local and foreign representatives from industry (finance, healthcare, marketing, technology), chambers of commerce, academia and policy agencies weighed in on how programs like the PET Sandbox should continue pursuing their objective of catalysing adoption of PETs.

Experience in the PET Sandbox

2. Companies which participated in the PET Sandbox shared their use cases and experience piloting PETs. One use case involved delivery of valuable data insight to clients and market researchers. These insights were derived from data contributed by partners from different geographies, while ensuring compliance and data security using Trusted Execution Environments (TEE). The TEE ensured that the host party was unable to access or use sensitive data inside the TEE.
3. One of the key challenges in system design was to provide hassle-free user interface for the data partners who did not have the capability or resources to manage their own TEE, while ensuring that data use and disclosure comply with diverse regulations across various jurisdiction.
4. Another use case aimed to identify entities involved in cross-border money laundering while safeguarding privacy and complying with relevant financial regulations. The piloted solution leveraged Homomorphic Encryption (HE) to ensure that a suspicious bank account's identifier is encrypted before being queried on, and that only the aggregated output of the query could be decrypted.
5. The primary challenge for the use case owner was navigating certain ambiguities interpreting financial regulations in the context of using HE. For instance, one of the jurisdictions permits sharing of financial data for the purposes of AML/CFT (anti-money laundering/combating the financing of terrorism) but disallows storage of such data outside its jurisdiction unless processing of that data is completed within a short period of time. As such the regulatory bounds of cross-border transfer HE-protected (i.e. ciphertext) financial data to run a short query need to be addressed on a country-by-country basis.

6. A secondary challenge it faced was working on ways to improve the response time of queries run on HE-protected data.

Challenges and Opportunities in piloting PETs

7. While there was consensus around the continued need to pilot PETs to unveil their technical and regulatory bounds, additional considerations were critical to the adoption of PETs. The first such consideration was identifying suitable data partners, which should have qualities such as:
    - Large market share in a region of interest,
    - High-volume of useful but under-utilised data,
    - Motivation to generate value from data insights, and
    - Prepared to invest engineering resources and time.
8. While lack of technical competency in data partners was not an insurmountable obstacle, it was important to explain the technology to data partners to increase trust in the use of PETs.
9. Another consideration was around the conditions for compliance for PET systems. Companies faced challenges demystifying regulatory phrasing such as "reasonable measures" and legal untangling in the context of PET systems took significant resources. This view was shared by many, especially those in financial services and advertising sectors. An example of regulatory ambiguity that resulted in long deliberations was the form of data *output* computed using PETs that would be acceptable to regulators.
10. On new opportunities, there could be significant role for PETs in Large Language Models (LLMs) as they stand to benefit from broad distributions of data in various data silos. Additionally, with the ability to code and query databases, LLMs could be the biggest users of PETs (e.g. spinning up confidential computing nodes, making federated analytics). Such highly generalised PET-enabled LLMs would subsequently require smaller amount of data to train for use cases.

Enabling more companies to adopt PETs

11. To encourage more companies to adopt PETs, industry urged regulators to provide guidelines not just to specific use cases, but to expand the guidelines to cover categories of use cases. A framework which recommends PETs to be used in such categories of use cases could be relevant both in Singapore and in Southeast Asia. Companies could also be made aware that due to the inherent limitations of certain PETs in certain scenarios, multiple PETs techniques may be required to solve a use case.

12. It was also important for IMDA to lead the way in educating its counterparts in other jurisdictions about PETs and help companies operating in Southeast Asia. Some regulators did not yet understand how PETs work and were unfamiliar with the ecosystem and its business models. As such, IMDA could leverage its network of regulators to propagate learnings from the PET Sandbox program.
13. IMDA could also consider forming expert groups, following similar efforts from other authorities, such as the UK Financial Conduct Authority's 'Synthetic Data Expert Group', or engage standards bodies, like the W3C's 'Private Advertising Technology – Community Group', to discuss technical approaches which provide privacy and support advertising. Given that Singapore is leading the effort in the region, a regional PETs consortium with diverse stakeholder representation (including commercial competitors), a focused charter and use-case specific proposals, could further push the adoption of PETs.

Conclusion

14. This year's PET roundtable recognized that as navigating real-world implementation challenges continues to be necessary for driving adoption, initiatives like the PET Sandbox should build on the momentum and continue supporting more companies to pilot PET use cases with regulatory, financial and technical tools.
15. Case studies of completed pilots, which detail the choice of PET, profile of data partners, system-level technical & governance safeguards and conditions for compliance, could be published. Additionally, guidelines can be drafted to apply to a larger "family" of use cases to help more businesses find their own applications for PETs, rally support from internal stakeholders, and build trust with data partners.
16. Taking a regional viewpoint, the roundtable recommended IMDA to take learnings from its PET Sandbox, tightly scope them into a few focused use case scenarios, and propagate these overseas in partnership with other regulators or industry associations as a vehicle to find alignment in regulatory and technical standards for PETs.

For more information on IMDA's 'PET Sandbox' program, please visit the program website here or contact the team at data_innovation@imda.gov.sg.