SINGAPORE FINTECH FESTIVAL

Organised by

Monetary Authority of Singapore

In partnership with

The Association of Banks in Singapore

Industry Problem Statements

Hackcelerator Powered by

pwc

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100 PROBLEM STATEMENTS

The global FinTech community and the financial industry submitted problem statements for the Global FinTech Hackcelerator.

They also identified potential applications of technology to address these challenges.

The problem statements and suggested solutions may have been edited for consistent reading. The edits do not substantially alter the intent of the original statements submitted.

SINGAPORE FINTECH FESTIVAL

Contents

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1.

kyc & identity authentication

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Kyc & Identity authentication

1 Digital Documents

When processing loan applications, financial institutions require companies to submit originals of documents that are witnessed by a lawyer/notary. The reliance on paper documentation can be cumbersome and resource intensive. As a result, small companies may be underserved because this process is expensive.

Develop a platform that would facilitate digital exchange, signatures, and authentication of notary documents. This platform may also be used for board resolutions, credit facilities, as well as other forms of contracts.

Flexible platform (API)

2 Authentication METHODS

Consumers with weak or common passwords are exposed to unnecessary account risks. Token-based authentication may also be inconvenient when not readily on-hand.

Propose a different approach to authentication that is not reliant on passwords or tokens , and would not require financial institutions to invest separately in authentication infrastructure.

Flexible platform (API)

Kyc & identity authentication

AML is a process that is common across the financial industry. For example, to remit an international payment from a payor company to a beneficiary company, sanction screening is performed by the payor, the payor's bank, the correspondent bank for payor, correspondent bank for the beneficiary, and the beneficiary's bank.

Develop a solution that would leverage a common international platform and infrastructure. This solution could be made available to industry players through a subscription service.

3 Common Platform

Flexible platform (API)
Distributed ledger

Paper-based application forms and documents are common in the industry. Currently, there are a handful of electronic solutions but these are expensive and may not be suitable when originals are required. Financial institutions also have their own electronic portals but those are governed by unique processes, tokens and passwords.

Develop a platform that would enable secure authentication and transmission of documents and contracts.

4 Secure transmission

Flexible platform (API)
Distributed ledger

Kyc & Identity authentication

KYC processes can be quite time and resource intensive.

Develop a central platform that would consolidate information required for the KYC process and validate this information against local KYC requirements. This platform should also be able to integrate real-time alerts that would be triggered by specific events.

5 Central Platform

Flexible platform (API)
Distributed ledger

For KYC and AML requirements, customers have to repeat the same process and provide the same information to every financial institution.

Develop a central database for KYC/AML that would be accessible by all financial institutions through a secure platform that has high encryption and authentication using biometrics. Sharing of customer data should be subject to user approval.

Ideally, this platform should also enable new account creation with financial institutions.

6 Secure platform

Flexible platform (API)
Biometrics

Kyc & identity authentication

Many financial institutions struggle to maintain an up-to-date database for AML checks. In reality, this data is not proprietary yet is maintained separately by each financial institution.

Develop a central repository that would be shared among all market participants. This repository would be a single source of reference to identify counterparties, company structures, as well as other publicly available information.

7 Central Repository

Flexible platform (API)

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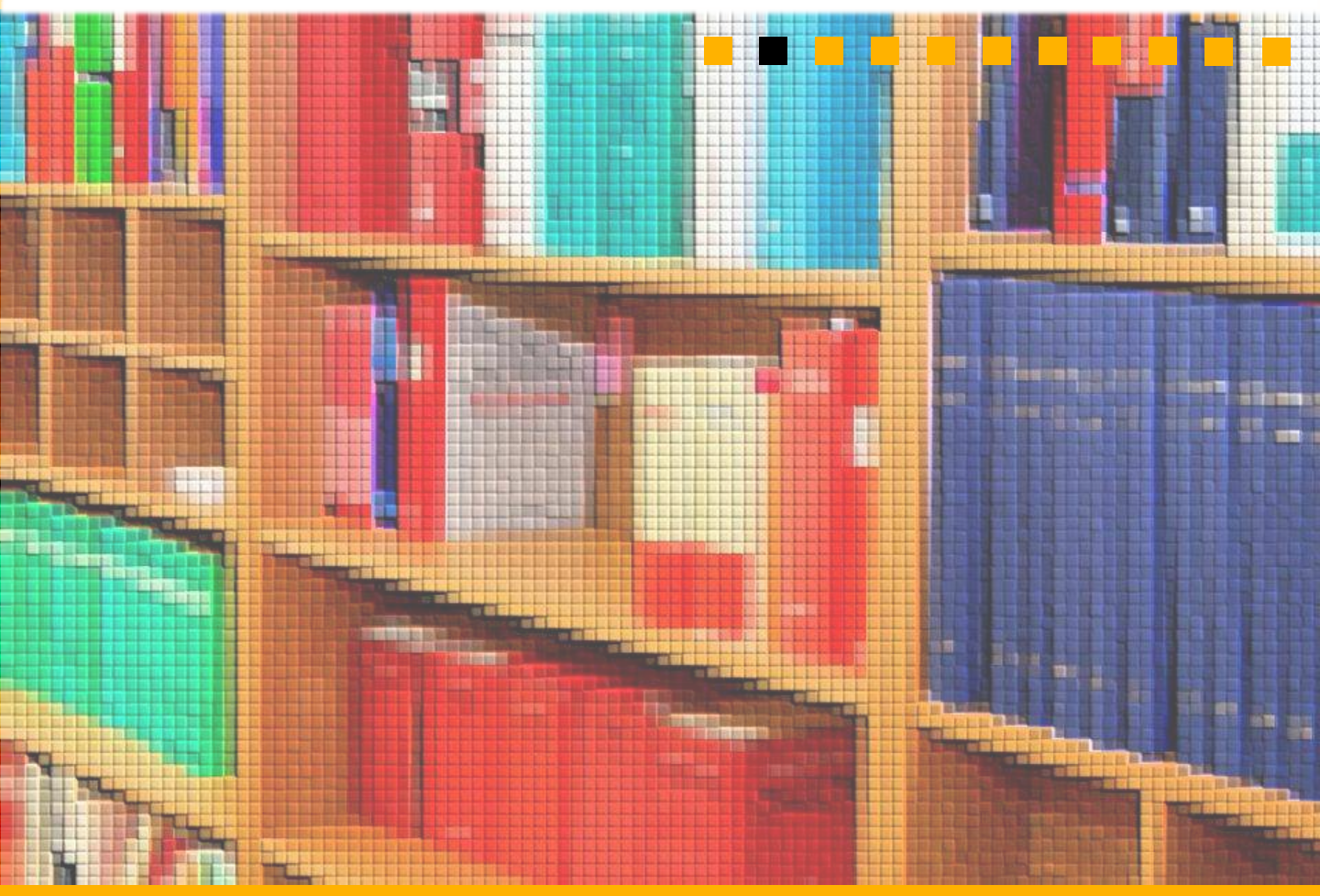
KYC identity

2. REgtech



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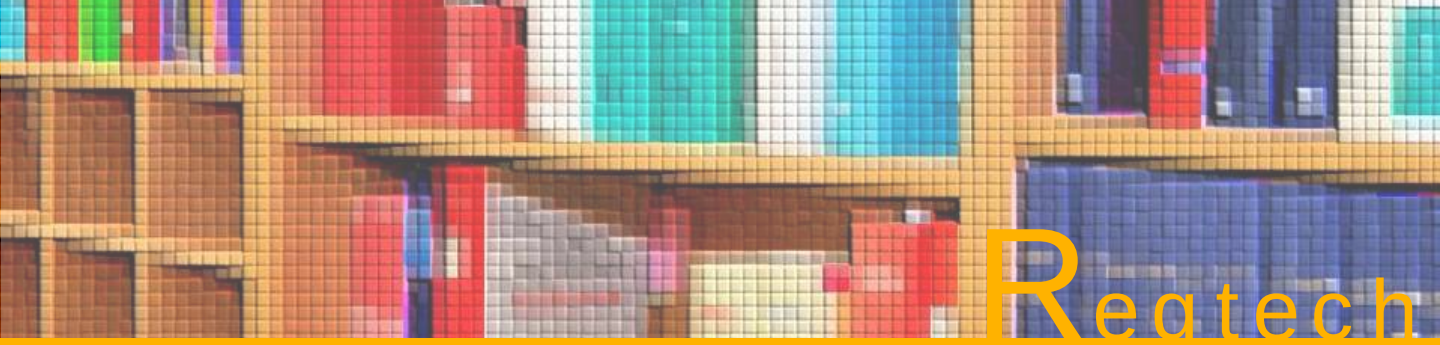


Regtech

Currently, there is no system that effectively enables institutions to track and monitor counterparty risk and market exposure.

Develop a platform that collects trade data to conduct real-time analytics and provide automated reporting while taking into account constraints such as sanctions, AML and KYC reporting, as well automatically blocking of transactions against suspicious accounts. This platform would be used by the industry for internal risk management, stress tests, and mitigating other risks.

8 Real-time Risk Analytics

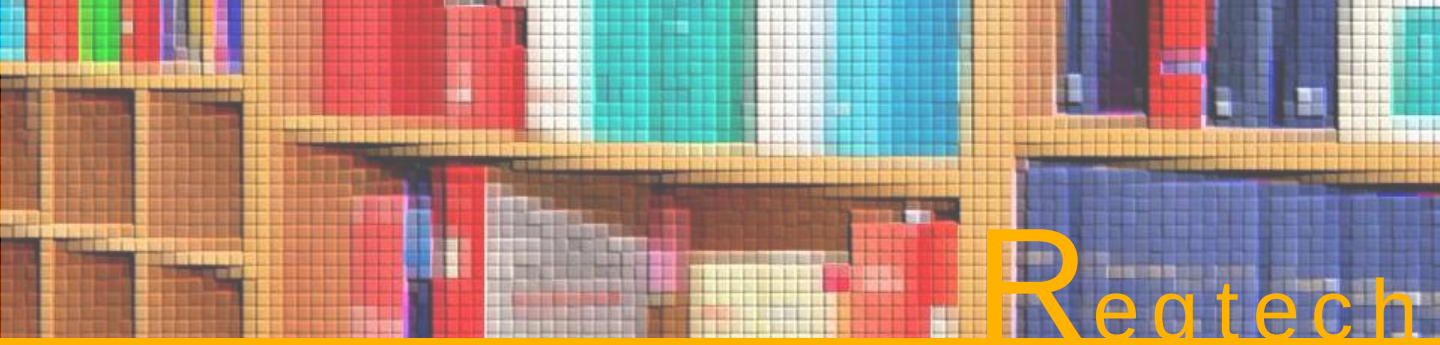
Big data
Distributed ledger

Financial institutions need to optimise the monitoring of individual transactions and identify deliberate misconduct during the on-boarding and servicing of customers.

Develop a machine learning application that would identify behavioural patterns. For instance, time to complete processes, missing fields, amendments, and multiple transactions are already understood to be highly correlated to suspicious activity. There are certainly many more tell-tale signs that could be used to detect potentially fraudulent behaviour.

9 Fraudulent Behaviour Detection

Big data
Learning machines



10 Common Industry API Platform

Regulation and standardisation initiatives such as Europe's Revised Payment Services Directive, the UK Open Banking API Standard and the Korea Open API Platform are requiring banks to open up their services (and information platforms) in a consistent way. On the other hand, FinTech companies are driving demand for banking services such as customer on-boarding, KYC, payments, transaction history, and account information.

Create a digital financial services exchange (an API platform) that will drive the standardisation and implementation of a common set of banking APIs.

This API platform would reduce both time to market and investment needed by banks to create open APIs. The establishment of this exchange would also lead to the development of a range of innovative customer centric solutions such as universal digital wallets, self-service financial advice, and efficient trade solutions.

Big data
Distributed ledger

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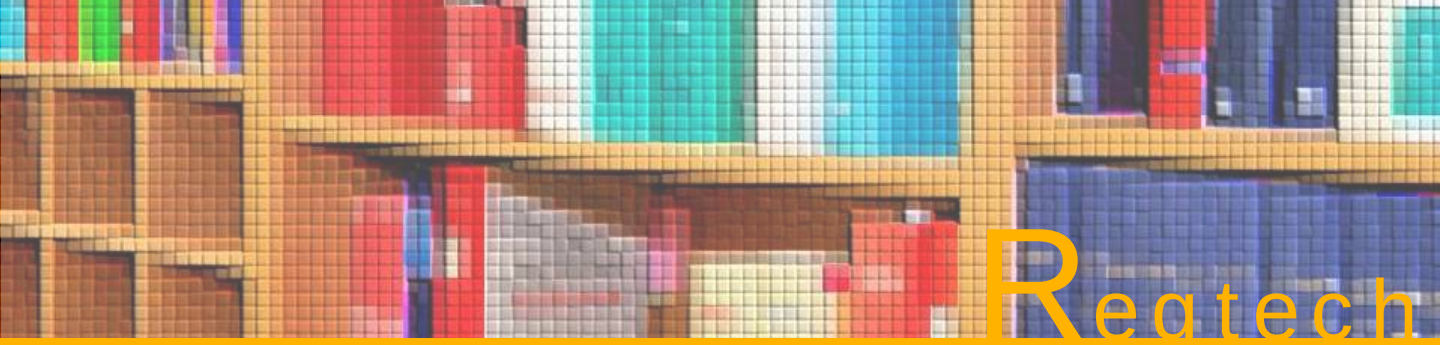


Regtech

Increased cyber-security risks have necessitated stricter regulatory and compliance requirements.

Develop an application that would help licensed representatives adhere to individual obligations such as maintenance of personal securities registers and changes in personal particulars. This application could also provide the local regulators with regular updates through a data platform .

11 Compliance tools

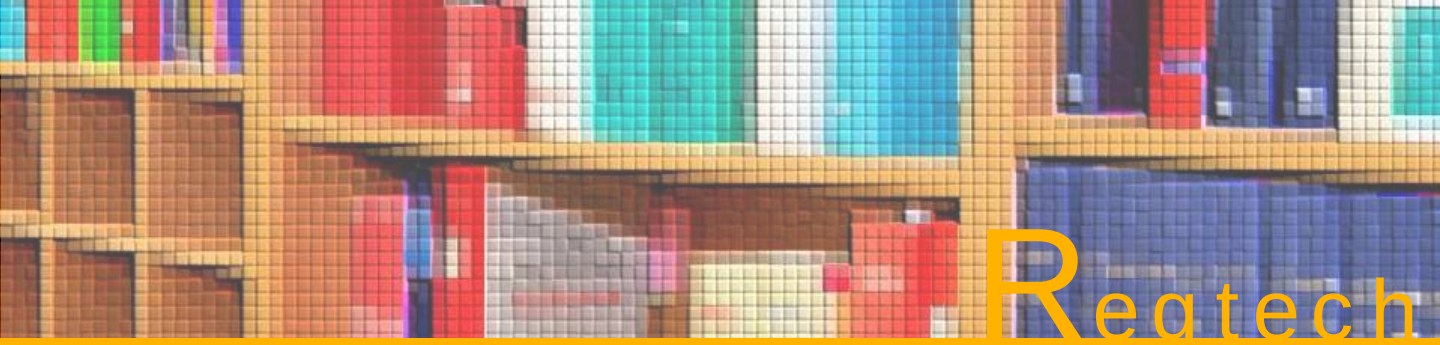
Flexible platform (API)
Big data

Compliance departments have to verify a large number of transactions to potentially identify insider trading.

Develop a technology that would leverage machine learning to recognise patterns of fraudulent behaviour and automatically flag potential insider trades.

12 Insider Trading detection

Learning machines



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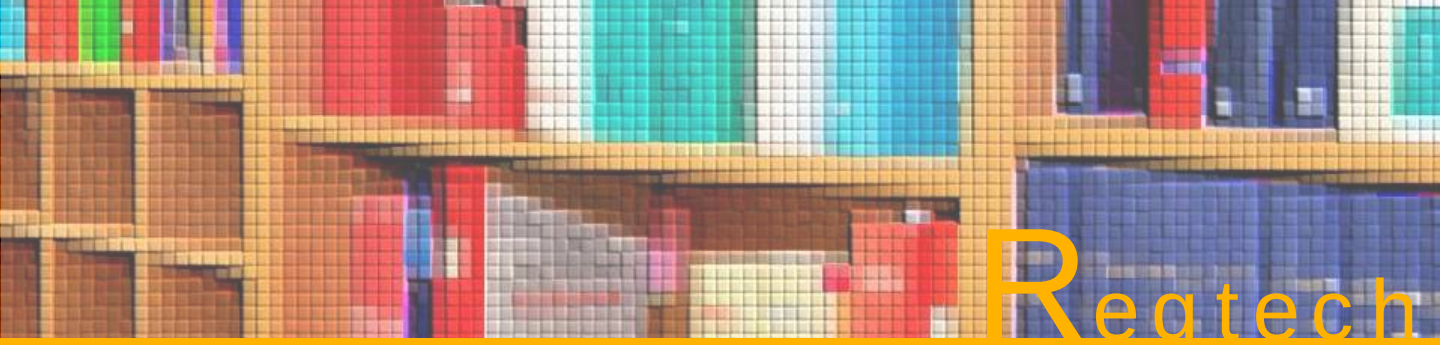
Transaction Compliance tools

Regulatory reporting for financial institutions is not globally standardised and can be interpreted in different ways (sometimes even interpreted differently within the same institution). A given customer, portfolio or OTC transaction may be impacted by many different regulations simultaneously.

Many financial institutions are attempting to build an in-house solution but are finding it challenging to coordinate different regulations across multiple jurisdictions.

Create a solution that would identify the regulations that each transaction or account needs to comply with and the body it needs to be reported to. The solution could be an all-encompassing rules-based engine, or it could target one set of regulations (e.g. derivatives trade reporting).

Flexible platform (API)
Big data



Regtech

Regulatory reporting may still be manual and therefore tends to be costly and time consuming.

As we move towards an automated trading clearance system that leverages on blockchain, regulatory reporting requirements should be just as automated and transparent.

Identify reporting systems that can be automated directly on the blockchain and build in automated or convenient regulatory reporting in the process.

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Automated Regulatory Reporting

Distributed ledger

International banks need to adhere to regulations from many countries. However, regulations are published in different formats and structures. For banks to automate processes and systems around these regulations, they need to be unified and regrouped into a set of rules per country.

Design a solution that can read many different types and formats of banking regulations and codify the content into a rules / data model.

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CODIFIED Regulations

Flexible platform (API)
Distributed ledger

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3. TRADE FINANCE

Trade finance

There is a lack of awareness on trade finance and trade credit products that are available to SMEs.

Establish a digital marketplace that would include banks, insurance companies, credit agencies, marketplace lenders and the SME sector. Trade financiers would list products and services available to the SME sector with online applications, basic terms, and contracts. In turn, SMEs would be able to post trade finance opportunities with their contact information and credit scoring.

Ideally this platform would leverage on blockchain technology to improve reliability and visibility in cross border trades while incorporating a mobile solution to track, settle and confirm trade flows.

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Blockchain Platform

Distributed ledger
mobile payments

The trade finance industry is facing many challenges when it comes to verifying that trade documents are authentic as these are still verified manually across multiple parties.

Develop a smart contract solution that would leverage the data collected from IoT and sensors on ships as well as on goods themselves to trigger certain arrangement conditions. Combining this smart contract solution with the use of blockchain would provide a level of security and trust concerning arrangement conditions and their execution.

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Smart contract

Distributed ledger

Trade finance

18 Digital Documents

Establish a digital supply chain finance hub that incorporates leading technologies in cargo documentation, SWIFT's MT798 trade messaging utility, BPO and blockchain with a focus on trade finance applications in Singapore.

Consider developing a pilot with a few critical stakeholders from the trade ecosystem as a working group. This working group could include banks, shipping companies, chambers of commerce, insurers, customs authorities, government agencies, and regulatory bodies. This pilot would be a risk-based and policy-driven approach to digital document security that would have the potential to be adopted by all players along the trade supply chain.

Flexible platform (API)
Distributed ledger

19 Self Authentication

Today trade finance operations still use traditional methods such as fax and emails. This process is tedious and prone to human error.

Develop a solution that would enable self-authentication and reduce fraud. Both agents and institutions could go to this platform to verify document authenticity and update trade status.

Distributed ledger

4. INSURANCE

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INSURANCE

The insurance claim process can often be confusing and time-consuming for claimants and both labour intensive and costly for insurers.

Develop a technology that would automate the claims process. This should result in reduced filing effort, faster payouts and a reduction in fraudulent practices.

20

Automated Claims processing

Flexible platform (API)

Insurance is a process-intensive business that relies on intermediaries for the recording and transmission of information.

Find a way for insurance companies to integrate blockchain technology that would enable P2P exchange of information and/or smart contracts to eliminate the need for third party verification.

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Smart contract

Distributed ledger

INSURANCE

The increasing complexity and scope of insurance products make it difficult for individuals to track what they have bought and assess the suitability of new products.

Develop an end-to-end insurance platform that would allow the customer to manage, track, review, and buy insurance policies in a simple and informed manner. The platform should allow the insurer or intermediaries to sell their solutions directly to the customer.

22

End-to-End Platform

Flexible platform (API)
Learning machines

Insurance products are typically linked to vulnerable moments in people's lives. Customer engagement is generally limited to policy quotes, customer acquisition, contract renewal, and claims.

Develop a tool that would leverage social media and public information to drive customer engagement and identify potential leads in the Insurance sector.

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Social media Engagement Tool

Flexible platform (API)

INSURANCE

Insurers have traditionally based their underwriting and pricing principles on a limited number of variables. Emerging technologies, such as wearables equipped with sensors from heart-rate tracking to GPS, routinely capture real time biometric and lifestyle data.

Build a “pay-as-you-live” ecosystem that would provide personalised premium ratings based on the data collected to customise life and general insurance coverage.

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Smart Pricing (lifestyle)

Advanced sensors
Big data

Insurers typically base their products and services on simple static health data.

Develop a health monitoring application that would capture smart home sensor data and health application. This data could also leverage medical record history provided by hospitals, insurers as well as data from smart health hardware providers.

The use of data analytics would enable insurers to develop new pricing models around healthcare tracking and smart home data.

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Smart Pricing (Health)

Advanced sensors
Big data

INSURANCE

Develop a smart car insurance product that would capture data from various sources (smart-phone, OEM connectivity) to generate driver profiles and develop risk scoring algorithms.

The solution would enable insurance companies to develop alternative car insurance products (pay when you drive, pay per mile, pay per journey) and provide incident related services such as claim automation.

26 Smart Pricing (Mobile)

Advanced sensors
Big data

Insurance premiums are generally charged using a fixed premium model and do not necessarily reflect the customer's behaviour or actual 'consumption' of the coverage.

There are still many unexplored uses of data collected from connected devices to be used in dynamic pricing models including, pay as you use pricing .

27 Smart Pricing (Home)

Advanced sensors
Big data

INSURANCE

During a severe road accident, parties involved must wait for emergency services to arrive. Drones could be used to better route traffic and contact the appropriate services (ambulance, towing, insurance company).

The following information could be captured from data collected by drone sensors/cameras:

- Evidence for insurers to access damage
- Providing photo and video proof for claims

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Data Collection Using drones

Advanced sensors
Big data

A new market is developing to insure against damage caused by commercial or private drones.

Build a platform that would assess the proficiency (experience, algorithms that assess previous flights) of drone pilots , the environment (previous flights), their equipment (flight time, drone used, wear and tear) and develop pricing models for drone related insurance products.

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Drone Pilot insurance

Flexible platform (API)

INSURANCE

Fraudulent claims make up a large part of the cost of providing insurance. Insurers could work together to monitor patterns and behaviour across multiple product lines.

Develop a technology solution that would gather, standardise, and analyse data to identify fraudulent behaviour. This tool could also integrate data across multiple product lines for a more complete analysis .

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Fraudulent Behaviour Detection

Big data
Learning machines

Insurers rely on historical data to predict future outcomes. The growth of connected devices gives insurers the opportunity to collect real-time information that would be likely to affect insurance claims.

Develop a solution that would enable insurers to reshape the predictive models they use to collect data and integrate this information into pricing, underwriting, and loss forecasting.

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Predictive Underwriting Model

Big data
Learning machines

INSURANCE

The insurance industry is looking for effective ways to leverage sensor data for real-time earthquake predictions to limit damage to infrastructure and human injury.

For instance, a data-driven alert and warning broadcast service could limit damage from catastrophes. However, it is unclear how accurate real-time earthquake predictions can be with existing available data.

Design a prototype that would predict earthquakes (or other natural disasters) using a time series of seismographic data at different locations. The goal would be to predict these events with very high accuracy as early as possible.

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Natural catastrophe Prediction

Advanced sensors
Learning machines

Product Disclosure Statements (“PDS”) are densely worded, legally binding and include formal disclosures required by law. Although these statements are important to the customer’s understanding of their insurance policies, in reality, most customers do not read them and therefore do not fully understand their products.

Design an innovative technology approach to make PDS easier to read by customers but at the same time meeting regulatory requirements.

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Human-centred Disclosure statements

Flexible platform (API)

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5. Financial literacy

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Financial Literacy

It is important to cultivate consumer education on complex personal finance matters.

Develop a comprehensive personal finance management tool that would enable consumers to understand the fundamentals of personal finance as well as the benefits of sound financial management. This tool should go beyond income and expenditure management to include tax planning and the planning of life events such as home ownership, marriage and saving for retirement.

34

Personal finance Management tool

Gaming and gamification

Mobile games provide an opportunity to engage children on personal finance education.

Create a free-to-play mobile game (with in-app purchases). The proceeds of in-app purchases would be placed into an investment vehicle and/or a personal account. After a certain amount of funds have been accumulated, the financial institutions running the game would provide tools that would enable customers to reinvest and manage these funds.

35

Gamified Investment Tool

Gaming and Gamification

Financial Literacy

Millennials have a different approach to personal finance. They may be less likely to consider longer term investment products.

Create an interactive digital ecosystem that would include various saving and investment vehicles, while leveraging on robo-advisor technology, that would allow insurers to offer advice when appropriate.

36

Interactive Digital ecosystem

Learning machines

Retail investors may not purchase financial products because of a lack of understanding.

Develop a user friendly tool that would appeal to this segment and educate individuals on financial products.

37

Financial Education tool

Gaming and gamification

Financial Literacy

Develop a creative and engaging tool, game or app that provides financial literacy education at strategic points in a person's early life.

The technology could include secondary school curriculum modules, or game style tools that teach basic financial skills such as opening bank accounts, as well as more elaborate financial concepts such as budgeting, savings, credit, interest, debt, financial planning or even basics on markets and how these work and interact.

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Financial Literacy App

Gaming and gamification

6. Financial Inclusion / SMEs

financial inclusion / smes

Digital KYC for mobile wallet transactions is difficult to implement for migrant workers in rented dormitories as they may not be able to provide proof of residence through a phone or power bill.

Develop a solution that would leverage on existing government authentication solutions (SingPass in Singapore) to validate the identities of migrant workers.

39

Authentication for migrant workers

Authentication

Customer service departments in the financial industry needs to keep up with the evolving digital world and the "always on" consumer.

Develop a solution that would offer an interactive, smarter seamless customer experience through the use of instant messaging and smart devices. This solution should integrate machine learning and AI to produce faster and more accurate responses to customer requests.

40

Digital customer service

Flexible platform (API)
Learning machines

financial inclusion / smes

Existing credit underwriting models do not leverage new sources of qualitative and quantitative information, both for individuals and SMEs.

Provide a solution that would leverage non-traditional data sources to selectively refine existing underwriting models (rather than re-write them). This would enable financial institutions to lend to new customers that they would have rejected before.

41

Data-driven Credit underwriting

Big data

Traditionally banks have built their systems around large multi-purpose relational databases, mainly because consistency was considered one of the most important aspects of bank data.

On the other hand, many apps for the “micro-service” model are built to be agile, but not necessarily scalable to capture a bigger market.

Build a simple microservice-based banking transaction service that can scale massively across many nodes while demonstrating data consistency within acceptable latency.

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Scalable Micro-services

Flexible platform (API)

financial inclusion / smes

Singapore SMEs continue to rely on paper-based methods to reconcile payments and accounts. Structural deficiencies associated with traditional methods such as returned cheques, lost invoices and T+2 processing time for telegraphic transfers can create a vicious cycle of inefficiencies.

Develop a full product suite for SMEs to manage their purchase orders, invoices and cash flows.

43

Finance& accounting suite

Flexible platform (API)

Credit evaluation has been historically based on audited financial statements of companies. However, many SMEs may not need to audit their financial statements and this makes the credit evaluation of these companies challenging.

In the digital economy, financial institutions should leverage new data points through social media and connectivity in the market as an alternative to their existing credit scoring model.

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Data-driven Credit Evaluation

Big data
Learning machines

financial inclusion / smes

Financial inclusion and credit offering continue to be a challenge in many markets around the world, especially in those where there is poor or limited information about a customer's credit worthiness.

Find a solution that would enable financial institutions (or other FinTech firms) to offer banking solutions (based on alternative credit scoring) to people that do not currently have access to basic financial services.

45

Banking solutions for the unbanked

Authentication

The United Nations High Commission on refugees estimated 60 million people have been displaced by war. This population has limited access (if any) to basic financial services.

A financial inclusion solution can address refugee pain-points in:

- Identification: undocumented refugees can be denied registration, basic services and asylum, resulting in forced detention or return to areas of conflict.
- Mobility/Migration/Remittance: identification is fundamental to orderly and legal channels for refugees to move. It is also critical to the safe remittance of funds back to their country of origin.

Create alternative identification and KYC methods that could be used by refugees and give them access to basic financial services. This solution could combine mobile and blockchain technology for both NGOs and refugees to track financial data and refugee movement.

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KYC for refugees

Authentication

financial inclusion / smes

Digital mobile payments are a widespread mechanism for delivering aid, but their successful launch would require banks and mobile network operators to partner together. Although there has been widespread adoption of mobile wallets, there has been little focus on adapting this model to the needs of this segment.

For example, phones may be limited in a refugee camp, therefore multiple people may depend on the same device. Creating multiple accounts under the same number would be a simple solution.

Smaller NGOs still use paper vouchers as means of payment, which can lead to fraud and violence.

Find a solution that would enable people in regions requiring emergency aid to make payments and withdraw cash through alternative networks. This solution could combine biometrics with blockchain and crypto currency.

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Mobile payments for administering Aid

biometrics
Distributed ledger

Services provided to SMEs are typically general in nature and not customised to their needs.

Develop an integrated solution that would provide banking and business connectivity to small businesses, based on their scale, growth stage, and service requirements. These services would be broader than simple financial services and would include business management.

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banking connectivity for SMEs

Learning machines

7. CUSTOMER ENGAGEMENT

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Customer ENGAGEment

Investors receive a large number of reports, recommendations and financial news from many different sources and there is currently no platform that can structure and aggregate this data.

Develop a platform that would consolidate news, information and reports that are relevant to investors based on their needs and investment strategies. This platform should provide investors with industry snapshots, financial news highlights, as well as research reports categorised by topic/analyst.

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Aggregated news for investment

Flexible platform (API)

There are many data sources available to financial institutions to research prospects, customers, products, and regulations. However, many of these data sources are irrelevant, incomplete or even incorrect.

Develop a solution based on sophisticated algorithms that can be used to cross-check the veracity of information available online. Software should combine all sources and provide filter options so that information from unverified sources can be eliminated.

50

Financial data analysis

Big data
Learning machines

Customer ENGAGEment

Young couples looking for their first property are usually faced with uncertainty during their research and evaluation.

Develop an application that can help prospective home buyers analyse financial information and match them with properties that they can afford. It should also provide an overview of the housing neighourhood based on public images posted on social media. The application should also allow users to document and review house visits and appointments in a fun and engaging way, compare different properties, and make an informed purchase decision.

51

Financial analysis for home buyers

Big data
Flexible platform (API)

Consumers need to manage a number of reward programs such as stamp cards, specialised store value cards, loyalty applications, and credit card point systems.

Build a platform that would merge loyalty rewards from multiple merchants and enable the (cross) redemption of reward points from different merchants.

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AggregateD loyalty rewards

Flexible platform (API)

Customer ENGAGEment

It is difficult to aggregate and analyse multiple customer data sets in real-time.

Create a technology platform that would redefine the way we think about customer loyalty and rewards. This platform would collect and integrate customer data within a loyalty engine and reward them for specific behaviours that are aligned with the interests of financial institutions.

53

Customised Loyalty rewards

Flexible platform (API)

Financial institutions communicate with customers via paper statements and advice. This is mostly done via traditional mail, which has limited security, long delivery times, and involves a lot of manual paper handling.

Create a mobile friendly application targeted at retail customers. This application would provide access to aggregated financial transaction details (if possible across different financial institutions), customisable reports from various accounts and/or financial institution, customisable storage for statements, personal data, and real time notifications.

54

Aggregated financial statements

Flexible platform (API)

Customer ENGAGEment

In a world where many financial institutions are moving from an offline to an online presence, many applications do not cater for persons with visual impairment.

Develop a mobile banking solution that would be tailored to the needs of the visually impaired. This solution would enable this segment to access a range of financial services such as balance queries and money transfer.

55

Mobile banking for the visually impaired

Flexible platform (API) mobile payments

In Singapore, there is currently no application that allows a person to manage and consolidate his/her accounts from different financial institutions.

Develop a platform (or a set of APIs) that would allow customers to merge their various online banking platforms to manage their finances.

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Aggregated personal finance

Flexible platform (API) mobile payments

Customer ENGAGEment

Consumers generally do not keep track of savings they have made through the use of discount coupons, loyalty programs, or price comparison engines.

Develop a solution that would enable customers to place the money that they have saved into a virtual deposit box. These savings could then be discounted against future spending (e.g. If an individual wants to go on a trip to Hawaii that costs SGD 5,000, the travel agent would only agree to give a discount if the individual saves a certain amount within a stipulated period).

57

Aggregated savings platform

Flexible platform (API)

In corporate banking, a company's decision to select a bank is influenced by many factors. Over the course of the relationship, there can be tell-tale signs of customer dissatisfaction (e.g. declining transaction volumes, declining operating cash balances, etc.).

Develop a solution that would enable banks to analyse customer relationship data to identify telltale signs of customer attrition so that they can improve and build lasting relationships

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Customer data analytics tool

Learning machines

Customer ENGAGEment

Travellers need to go to tax refund kiosks at the point of departure to claim their GST/VAT refunds.

Develop a mobile claim process that would directly credit the funds onto a debit/credit card at the point of sale to create a more seamless process for the verification of GST free goods declared by tourists.

59

Mobile tax refunds

Mobile payments
Flexible platform (API)

Banks have generally focused their efforts on their offline presence as that is where most of their customers come from. Going forward, it is conceivable that more business will be conducted online.

Design and build a lean online banking presence that can provide value-added banking services (excluding payments) to customers who frequent "new economy marketplaces"

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innovative Digital banking

Flexible platform (API)

8. Payments

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Payments

The IoT trend is characterised by greater connectivity due to the integration of sensors and computing capabilities in devices .

Design a solution that would integrate data collected from IoT devices within financial services and enable better financial decisions, budgeting, real-time purchases, as well as the payment of goods and financial services. This solution should address all privacy, security, identification, and authentication issues. It should also enable financial institutions to have better insight into customer behaviour and purchasing patterns.

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INTEGRATED IOT DATA

Advanced sensors
Big data

Singapore has high cheque usage rates. It takes an estimated 2 days to process a cheque and the cheque processing cost can vary from $3 to $5.

Develop a solution that would enable:

- Real time issuance of cheques using digital banking credentials
- Digital deposit of cheques
- Real time clearance of cheques via e-payment (leveraging the existing G3 network)

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Digital cheques

Digital payments

Payments

Many service providers have built their own wallets. However, these are not compatible from one to the other. The customer experience around bank transfers (push payments) or direct debit (recurring pull) payments is fragmented across Southeast Asia.

Develop a seamless payments solution that would leverage:

- Biometrics or strong authentication
- Linkage of authentication to unique ID accessible across all banks
- Funds transfer via digital/mobile medium (preferably single login)

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Seamless PAYMENTS SOLUTION

Mobile payments
Flexible platform (API)

In Singapore, there are few standard APIs that enable companies to transfer funds to bank accounts through a direct debit functionality.

Design a gateway interface that uses APIs to reduce complexity and the cost of multiple clearing interfaces for banks that would enable SMEs/merchants to

- Do direct debits/transfers at low cost
- Streamline/minimise the number of interfaces and messages that impact their core banking platform
- Select the appropriate clearing scheme based on the nature of the transaction

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API gateway

mobile payments
Flexible platform (API)

payments

In Singapore, some of the settlement systems are becoming obsolete. Legacy systems need to be upgraded and/or replaced.

Design a solution that would improve existing settlement systems to:

- Reduce settlement periods
- Facilitate authentication

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efficient SETTLEMENTs

Digital payments
Flexible platform (API)

Schools in Singapore require cash payments for different transactions, e.g. canteen purchases, school enrichment classes, textbooks purchases, school bus services. Typically, parents give pocket money (in cash) to their children to manage such expenses.

Design a solution that would enable a cashless school system. Information could also be used to monitor students' expenditure and even dietary habits.

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CASHLESS SCHOOLs

mobile payments
Big data

Payments

Small payments at hawker centres are usually cash-based. As a result, owners may encounter cash management issues, delayed settlements, and even loss of customers. Cash payments also make it challenging for regulators to track earnings and calculate taxes.

Create an alternative payment solution that would not result in adding costly infrastructure for the hawker stall owners.

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PAYMENTs for Low-value transactions

mobile payments
Flexible platform (API)

The collection of season parking payment is fragmented in Singapore and may create frustration for car owners. Season parking payments typically come in several forms.

Design a solution for a more convenient, frictionless way for drivers to pay for their season parking fees on time and online, without the use of cheque and cash. The solution could be extended to help the management company automate back end accounting and activation of services.

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SEAMLESS SEASON PARKING FEE PAYMENTS

Digital payments
Flexible platform (API)

payments

Technologists expect 2016 to be the year of mobile wallets. However, the offerings among current wallets are very similar and undifferentiated.

Find a solution to enhance the value proposition of mobile wallets to create customer stickiness, promote a mobile centric lifestyle, and give individuals a compelling reason to stay within the mobile wallet ecosystem.

Some suggestions could include loyalty, couponing/discounts, real time redemptions that add further value beyond the simple payment solution.

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enhanced
Mobile wallet

mobile payments
Flexible platform (API)

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Payments

Large companies can integrate their Enterprise Resource Planning systems with SWIFT or directly with banks using host-to-host APIs. However, smaller companies do not have the capacity to integrate their systems, resulting in a lot of manual operations to manage incoming and outgoing money flows.

Develop a rules-based engine that would perform automatic tasks when certain conditions are met. These rules could either be configured in the online platform or uploaded through APIs.

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Automated payments ENGINE

Learning machines
Flexible platform (API)

Instead of building proprietary online apps, banks could integrate with existing platforms (e.g. messaging apps).

Develop a cross platform payment solution that would allow users to send money via an integrated keyboard in any text-based content (Facebook, WhatsApp, Line, etc.). As a result banking can be integrated into the daily conversations of its consumers without the need to redirect to proprietary banking apps.

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CROSS-PLATFORM PAYMENTS

Mobile payments

9. Portfolio Management

Portfolio management

A lot of manual processing is involved when distributors and financial advisors fax subscription and redemption orders to registrars of funds or when investors send their orders to distributors and financial advisors.

Develop a B2C2B platform to automate the end-to-end ordering process for fund management and insurance industry. This solution should cut across retail and institutional investor order channels and enable order placement with distributors, financial advisors, and registrars of the funds.

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Automated institutional investments

Flexible platform (API)

Asset managers in Asia face timing issues for portfolios maintained in Asian currencies, as the underlying indices are based on US or EMEA markets. This causes delays in index production due to usages of specific FX rates.

Develop a solution that would:

- Connect the regional exchanges to publish the indices in local Asian currencies
- Build a predictive FX rate model that can be vetted by a central agency (if an FX rate accepted by the industry is not available in real time)

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PREDICTIVE FX RATE MODEL

Big Data
Flexible platform (API)

Portfolio management

Fund management and insurance companies are required to publish NAV prices for their investment products. While fund managers and insurance companies have processes and controls to minimise valuation errors, these are not foolproof. There also appears to be no robust, systematic “diagnostic tool” that flags potential valuation errors.

Develop a real-time diagnostic tool that would detect NAV calculation anomalies across a large number of portfolios.

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REAL-TIME DIAGNOSTICS

Learning machines
Big data

Currently, financial advisors assess their customer’s investment profile based on static questionnaires.

Develop an interactive customer evaluation tool that would enable financial advisors to accurately assess a customer’s investment profile on an on-going basis. The main features of the tool should include:

- Behavioural finance based interactive questions
- Risk profiling and scenario modeling/simulation
- Learning modules for customer

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INTERACTIVE CUSTOMER EVALUATION

Learning machines
Big data

Portfolio management

Asset Managers need to take into consideration a number of factors when building a portfolio for their customers such as:

- Portfolio performance
- The risk appetite of the customer
- Investment theme
- Risk factors and regulatory considerations
- Risk exposure metrics

Typically, these are either dealt with heuristically or through weighted averages, which leads to sub-optimal portfolio performance and diminished investor returns.

Develop a portfolio management tool that would deliver a decision making framework and a calculation engine that builds a portfolio consistent with the objective of all stakeholders (investors, risk managers, salespeople, and regulators).

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Smart PORTFOLIO MANAGEMENT

Learning machines
Big data

SINGAPORE FINTECH FESTIVAL

Portfolio management

Robo-advice is trending as a new way to explore customer needs and deliver financial advice.

Develop an automated and real-time investment advice engine that would include:

- A robust goal-based investing and planning framework
- Algorithm-driven asset allocation and portfolio rebalancing. This should be customised, tax efficient, and with minimal human intervention
- Real-time product recommendations that are in response to goals, market events, and trading history
- Timely alerts and recommendations

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REAL-TIME INVESTMENT Advice

Learning machines
Big Data

Pre-packaged solutions offered by financial institutions may not be easily customised and thus adapted to customer lifestyles. Financial institutions could be more transparent on what their offerings are and what other people in similar situations have opted for.

Build a platform that takes into account publicly available information (e.g. Facebook, Twitter and meta data) to determine individual protection needs and suggest a tailored solution.

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data-driven INVESTMENT RECOMMENDATIONS

Learning machines
Big Data

Portfolio management

Providing structured products to retail investors in Asia is a challenge. There is a lack of standards in technology and corporate actions, lifecycle event communication, custody and settlement, as well as secondary trading venues for structured products. This undermines efficient handling, thus keeping processing prices high for investors, which in turn increases minimum creation sizes.

The value chain for structured products needs to be more efficient by integrating price-finding venues, multi-issuer platforms, reference data and corporate action communication standards, core banking, and connectivity services.

Develop an issuer neutral market access for certain structured products to enable:

- Efficient price discovery and customer suitability checks in accordance with various rules and regulations
- straight-through execution and post trade processes, including the evaluation of instruments, provision of term-sheets, monitoring, and processing of lifecycle events
- Provision of educational and information documentation to facilitate the decision making process

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Neutral platform For Structured Products

Learning machines
Big data

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Portfolio management

There is a need to improve access to updated pricing information (e.g. loan rates, deposit rates, brokerage rates) that allows financial institutions to calibrate their pricing strategies quickly.

Develop a tool which can be integrated with the investment management platform to:

- Compare pricing and changes
- Predict possible surges or dips

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Investment Management tool

Big Data
Flexible platform (API)

Most robo-advisors base their analysis on quantitative data (historical prices, index data, economic statistics, etc.). However, this can lead to a lag in performance as opposed to a combination of both quantitative and qualitative data.

Develop a next-gen robo-advisor that leverages AI and natural language processing to provide effective trading strategies using both qualitative and quantitative data.

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Robo-Advisor

Learning machines
Big data

Portfolio management

Large buy side firms currently use central matching applications combined with industry databases. However due to lack of resources, many of the smaller buy side firms require their brokers to process their trades through manual methods. These methods are subject to risk of human error, mismatched trades, trade failure, and higher servicing costs.

Develop a product that would be tailored to smaller buy side firms to enable straight-through processing through a central matching application. This should lower the cost of trade processing, operational and counterparty risks, and would enable greater connectivity between players in the industry.

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Straight-Through Processing

Flexible platform (API)

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Portfolio management

Real estate and unlisted equities may account for a large portion of wealth management portfolios. However, data for these assets may not be available because of formatting issues or limitations on current Optical Character Recognition ("OCR") technology.

Develop a research aggregation service that would cover these classes of assets. This service could leverage AI and machine learning to provide customised research results and product recommendations.

83

Research Aggregation Service

Flexible platform (API)

The shareholder on-boarding, maintenance and reporting requirements in the asset management industry is costly and prone to delays and errors.

Develop a solution that would automate the recording, transfer, and reporting of shares while reducing the margin for human error. This solution should be easy to access and flexible enough to support local variations.

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Automated reporting

Flexible platform (API)

10. Capital markets

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Capital Markets

The settlement of payments and trading of assets (bonds, securities) is a lengthy process.

Build a solution based on blockchain technology and shared ledger related technologies that will shorten the time needed to process interbank settlements. The solution should:

- Work even if multiple banks are offline
- Be fast enough to handle more than 50 transactions per second
- Be scalable enough to allow several banks in a country or in a regional alliance (APAC), to join the same network
- Support a number of policies that allow a governing institution, such as a Central bank, to control and govern the blockchain whenever needed.

85

Efficient payments settlement

Distributed ledgers

The settlement of financial securities (e.g. stocks) currently takes two to three days.

Design a solution that would reduce the settlement process from the current 2-3 days to less than a minute.

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Efficient transaction settlement

Distributed ledgers

Capital Markets

Australian short-term money market instruments are settled on the trade date in the Australian Securities Exchange system between members of Austraclear.

However, if one of the trade is not a member (e.g. domestic or foreign investment managers), they use their custodian bank (that is an Austraclear member) to settle the trades. Communicating the notification to settle requires the ISIN for the instrument and this creates processing challenges.

Develop a technical solution that would enable non-members of Austraclear to easily identify the ISIN code of the instrument they have traded. This would enable them to create clear and unambiguous settlements as well as notification messages they can send to their custodians via SWIFT network.

87

Streamlined Trade Settlements

Flexible platform (API)

The dissemination of interest rates is manual (communication is still done via e-mail / phone call). This slows down decision making and trade execution processes (speed, frequency, amounts, margins).

Develop a secure distributed platform that consolidates real-time rates from all banks to transact on dynamic real-time pricing.

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Secure distributed platform

Cloud computing
Flexible platform (API)

Capital Markets

The inappropriate use of credit mitigating techniques was at the root of the sub-prime crisis. As a result, the banking industry is facing more stringent regulations and a higher cost of capital.

Develop a platform that provides optimal collateral and risk management capability to enable capital relief through financial structures, improve the speed of decision making, and lower the cost of compliance.

89

Collateral & risk management

Flexible platform (API)

Retail investors of unit trusts are subject to distribution charges (i.e. front-end fees or commissions, and redemption or back-end fees). However, these charges, which can be as high as 5% of the investment, are not transparent and are highly varied even among similar types of unit trust products.

Develop a solution that will improve the transparency as well as the variability of unit trust distribution costs while leveraging technology to enhance distribution efficiency.

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Transparent distribution pricing

Big data
Flexible platform (API)

Capital Markets

There is limited transparency on the cost of FX between different firms.

Develop a FX marketplace with integrated Central Counterparty clearing that supports T+1 settlement . Members would take part in FX pricing and would compete on liquidity.

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Integrated FX Marketplace

Flexible platform (API)

SINGAPORE FINTECH FESTIVAL

11. general

SINGAPORE FINTECH FESTIVAL

General

In the financial services industry, jobs that entail menial and repetitive tasks may be replaced by robotics in the not too distant future.

Develop a solution that connects with HR data to identify the groups that will most likely be at risk, match these with tailored training solutions and identify new job opportunities.

92

Tailored Training

Big Data
Learning machines

The world of learning and development is changing in the digital age. Instead of classroom training, learning should be real-time and contextual.

Develop an automated training program that would result in the faster onboarding of new joiners, require less supervision, automate compliance monitoring, and responds to global developments in real-time.

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Automated Training

Flexible platform (API)
Learning machines

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General

Some operational performance reports (e.g. business units' profit & loss, balance sheet, pipeline leads, and projections) are compiled manually through spreadsheets.

Develop a solution to produce these reports automatically while meeting the confidentiality requirements of a bank. Existing Cloud technology might not necessary meet the confidentiality requirements.

94

Automated Reports

Big Data
Flexible platform (API)

Financial institutions find it challenging to leverage cloud infrastructure due to uncertainty on the regulatory compliance of cloud service operators .

Develop an automated compliance testing solution for cloud service operators.

95

Compliance Testing

Cloud computing

SINGAPORE FINTECH FESTIVAL

General

Financial institutions produce thousands of reports for their customers. Although the production of these reports is automated, the translation of these into the customer's local language is manual, costly, and time consuming.

Develop a semi automated translation solution for financial institutions that enables efficient review and workflow validation.

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Automated Translation

Learning machines

Banking operations usually involve a lot of manual work to create formatted reports from original files provided by customers.

Develop a technology (similar to OCR) that would automate the creation of reports by categorising information from original files and condensing them into the required format.

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Automated Reports

Flexible platform (API)

General

Transactions submitted for processing by another party are typically encrypted for network transport and, in many cases, for storage. The data can be decrypted in its entirety by a party with the right keys. This poses as a potential cybersecurity risk.

Find a solution that would implement layered encryption so that portions of transaction data could be decrypted by trusted parties for processing. This would allow selective disclosure of information to different trusted parties on a need-to-know basis.

Parties with keys would have access to the data associated with the key they own. Only the owner of the data would have full access to the data.

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Layered Data Encryption

Distributed ledger
Cyber security

General

The process of assigning a unique transaction number agreed by both parties to financial transactions conducted OTC and bilaterally by non-electronic means is very problematic.

Find a smart algorithm that would independently generate the same transaction number based on key trade data inputs given by different parties.

E.g. Party A and Party B have agreed an OTC trade. If there was a service (or a library) they could use to generate the same transaction number when presented with trade data then this would increase efficiencies.

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Unique Transaction identification

Distributed ledger
Cyber security

Institutions could derive great insights from overlaying data from different types of data sources. Data sharing will drive innovations in Big Data. However data privacy and security discourage firms from sharing and exchanging data.

Develop a solution that would mask confidential information and attribute a common key so that information can be aggregated and exchanged without breaching customer confidentiality.

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Safe data sharing

Distributed ledger
Big data

Glossary of terms

2FA	Two-Factor Authentication
AI	Artificial Intelligence
AML	Anti-Money Laundering
API	Application Programming Interface
BPO	Business Process Outsourcing
FX	Foreign Exchange
GPS	Global Positioning System
IoT	Internet of Things
ISIN	International Securities Identification Number
KYC	Know Your Customer
NAV	Net Asset Value
OCR	Optical Character Recognition
OEM	Original Equipment Manufacturer
OTC	Over-the-Counter
P2P	Peer-to-Peer
SME	Small And Medium-Sized Enterprise
SWIFT	Society For Worldwide Interbank Financial Telecommunication

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