Artificial Intelligence in the Malaysian Financial System: Opportunities, Risks, and the Way Forward

Introduction

Recent years have seen artificial intelligence and machine learning (AI/ML) come of age with proven, real-world solutions being deployed across industries.

Breakthroughs in algorithms and techniques, greater abundance of data, and advancements in computational power have contributed to AI/ML's transformative impact and potential for businesses. At the same time, the growing pool of tech talent and expertise, scalable cloud infrastructure, and low cost solutions (e.g., open-source technology) have also lowered the barriers to adoption of AI/ML, thus hastening its adoption.

AI/ML promises new opportunities in finance...

In the area of financial services, the greater adoption of AI/ML techniques offers new propositions for enhancing customer experience and product offerings, particularly through product personalisation at-scale, and faster and more convenient service. AI/ML also helps unlock insights that enable FSPs to make better decisions, while also automating processes. In turn, these have the potential to help FSPs better manage risks, improve operational efficiency and productivity, and reduce cost.

In 2021, BNM conducted a preliminary survey on the use of AI/ML by FSPs with 25 respondents comprising banks, insurers and payments operators in Malaysia. The respondents were selected based on size and track record of digital initiatives, as well as participation in the Open API Implementation Group.[1] Diagram 1 captures the actual and potential use cases for AI/ML identified by respondents, which span across various functions and business lines.

The survey revealed that many FSPs in Malaysia are already actively using AI/ML techniques, with more initiatives under development. At present, AI/ML is most commonly being deployed in the areas of customer analytics and engagement, as well as for e-KYC and digital customer onboarding. Some banking institutions are also supplementing their credit underwriting processes with AI/ML techniques for selected financing products. The higher risk sensitivity of these AI/ML models promote prudent exposure to higher risk borrowers and more accessible services to deserving but underbanked customers. The survey also revealed strong interest and support from the senior management and boards of the FSPs. About half of the respondents considered AI/ML adoption as a potential game changer for the way they do business and are already looking for opportunities beyond the context of known use cases and current AI/ML projects. Diagram 2 sets out a summary of the key findings from the survey.

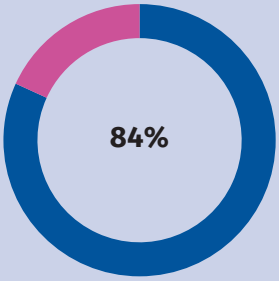
[1] Established by BNM in 2018 to promote standardisation of Open Application Programming Interface (API), which would enhance third party access to data, supported by the security, legal and governance frameworks necessary to protect customer data and financial institutions' core systems.

Diagram 1: Examples of AI/ML Use cases in Financial Services

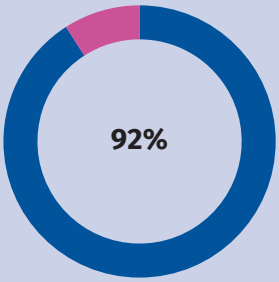
Source: Bank Negara Malaysia

Diagram 2: Summary of Selected

Most FSPs surveyed are actively using AI/ML or developing AI/ML projects...



21 out of **25** surveyed FSPs have at least one AI/ML project **in active use**

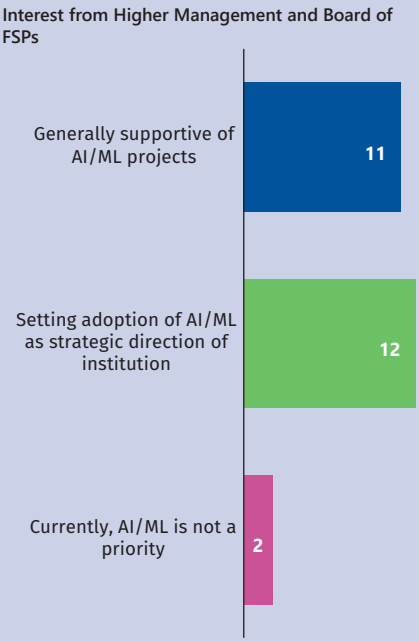


23 out of **25** surveyed FSPs have at least one AI/ML project **in development**

...mainly for customer analytics and engagement as well as KYC

	Top AI/ML Projects	No. of FSP by Use Case Areas
Banks	AML and fraud detection	13
Banks	KYC / Digital on-boarding	12
Banks	Customer Analytics & Engagement	8
Banks	Underwriting/scoring	8
ITOs	Customer Analytics & Engagement	2
ITOs	Human Resources	2
ITOs	Technology Risk Management	2
E-MI	KYC / Digital on-boarding	3
E-MI	Customer Analytics & Engagement	2

Enabled by the Management and Board of FSPs

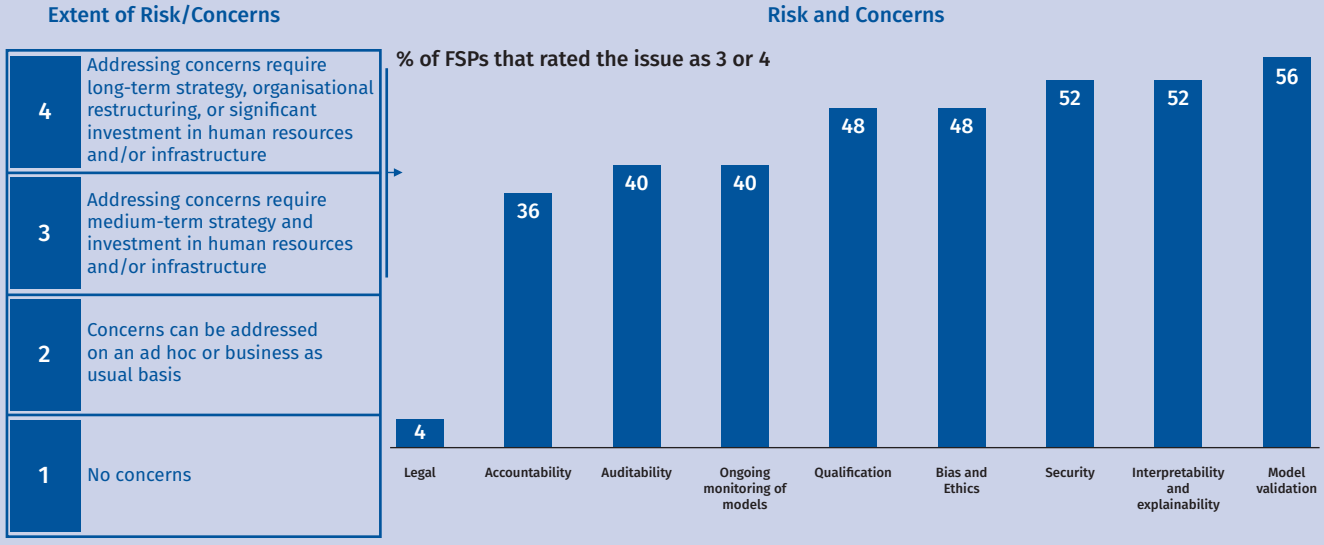


Source : Bank Negara Malaysia

...and risks which need to be carefully managed

However, the introduction and more pervasive use of AI/ML also raises a number of risks which the financial sector will need to manage. The survey surfaced several key AI/ML risks and concerns, as identified by FSPs (see Diagram 3).

Diagram 3: Risk and Concerns Identified in Adopting AI/ML

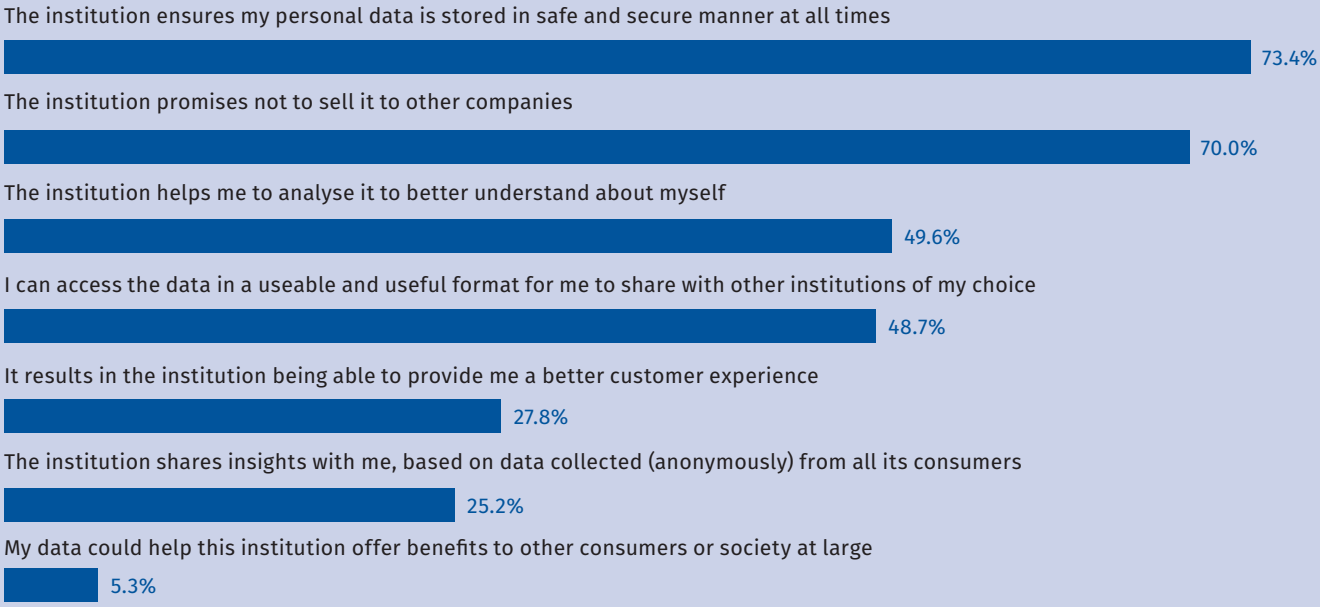


Source: Bank Negara Malaysia

Respondents to the survey cited model validation as the topmost concern of FSPs. Model risk is the risk that models fail to produce accurate results. As most AI/ML models and algorithms are significantly more complex than traditional linear models, model outputs can be difficult to explain and validate. The opacity of AI/ML systems may also delay the detection of any errors or inaccuracies. Timely validation of models, incorporating algorithms that are trained using updated data sets, is crucial in managing model risk and maintaining the predictive ability of the model. Without this, model performance typically deteriorates over time and could result in inaccurate predictions or larger than expected errors, which renders the model unreliable for decision-making. This could lead to undesirable outcomes, such as financial losses, or biased or unfair decisions which impact customers negatively, in turn, exposing FSPs to reputational and legal risks.

Another major aspect of model validation relates to data management and assurance of data quality. Some AI/ML systems require large volumes of data – including high-velocity transaction data – from a variety of sources. This requires robust enterprise data governance to ensure data reliability and quality. The use of a broader range of data, including personal data, also raises concerns about data security and privacy. According to an earlier survey on consumer trust conducted by BNM in 2021,[2] security and privacy are the most important determinants of consumer willingness to share personal data with financial institutions (See Diagram 4).

Diagram 4: Determinants of Consumer Trust in Sharing Data in Malaysia



*Percentages based on items ranked in top 3

Source : Bank Negara Malaysia

At a broader level, increased adoption of AI/ML by FSPs could potentially introduce new risks to financial stability, particularly if the models are poorly calibrated or inappropriately used. Examples of undesirable outcomes include discrimination of certain consumer groups, reduced operational resilience, or amplification of financial shocks from algorithm-driven behaviours. Such risks remain low at present based on the nature and extent of adoption of AI/ML by FSPs. Most FSPs are also approaching the implementation of AI/ML with appropriate caution and care. For instance, the implementation of AI/ML for credit underwriting is typically limited to selected financing portfolios, with close monitoring of the results before the scope is expanded gradually. There are also safeguards put in place by the FSPs to ensure AI/ML systems are kept in-check, such as monitoring of False Acceptance Rate for identity verification using e-KYC solutions.

[2] The survey titled "Consumer Trust Survey" was issued to the public in December 2021. The survey garnered 413 responses from individuals of all ages, income groups and education levels.

Regulations to promote responsible use of AI/ML

The global regulatory landscape governing the use of AI/ML remains relatively nascent. Nonetheless, an increasing number of financial regulators in economies such as Singapore, Hong Kong and the UK have published high level principles or issued guidance on best practices on the responsible use of AI/ML in the financial sector. Some of these documents were produced in collaboration with industry or academic experts. These issuances generally aim to ensure sound and transparent AI/ML systems, promote clear assignment of accountability, and ensure that FSPs pay careful consideration to fairness and other ethical concerns.

Diagram 5: Regulatory Requirements in Managing Risks from AI/ML Adoption

Fair Treatment of Financial Consumers (2019) requires FSPs to ensure that consumers are not subject to unfair discriminatory practices

Risk Governance (2013) states that "... use of models for identifying and measuring risk should be supported by robust processes for managing model risk"

Management of Customer Information and Permitted Disclosure (2021) sets out requirements relating to FSPs' practices and controls in handling customer information

Guidelines on Data Management and MIS Framework (2012) requires financial institutions to establish and maintain a sound data management and management information system (MIS) framework

Risk Management in Technology (2020) requires the technology risk management framework of a financial institution to include identification of risks from the adoption of new or emerging technology, and the associated controls and mitigations

Source: Bank Negara Malaysia

For Malaysia, FSPs are expected to observe existing regulatory requirements (see Diagram 5) in their use of AI/ML applications. While the existing body of standards addresses key risks and considerations that remain relevant to the use of AI/ML by FSPs, greater adoption – in terms of pervasiveness as well as specific use cases that have a higher bearing on critical risk drivers – could call for refinements to existing standards. In particular, further guidance around model interpretability and explainability may be needed as more insight is gained on FSPs' evolving practices. BNM will continue to closely monitor developments and innovations in the industry to inform its regulatory and supervisory approach in ensuring that the risks associated with AI/ML are understood and well managed.