



The New Paradigm for Disruptive Innovation in Banking

WHITEPAPER

How Discovery Bank uses the Databricks Data Intelligence Platform for Financial Services to derive value and opportunities for the business, clients, and society through data, machine learning and AI

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A data-driven approach and advanced analytics capabilities are essential enablers for a model built on the granular understanding of client behaviour.



Foreword

As we set out to build Discovery Bank in 2017, we knew we had to create a business model that was fundamentally different and addressed three critical factors. Namely (1) the nature of financial risk is inherently behavioural and, as a result, modifiable; (2) technological advancements enable a feature-rich, fully digital business; and (3) changing client preferences demand hyper-personalisation and an approach to banking that is not only profit-based but also inherently good for clients.

The result is what we've termed Shared-value Banking, and it frames everything we do at Discovery Bank. By developing an in-depth understanding of clients' financial habits and offering incentives for improvement, not only do our clients benefit, but we as a bank benefit from improved experience while contributing to a more financially resilient society. Five years in, the results are encouraging: We now service approximately 2 million accounts and our engaged clients receive 28 times more rewards and have a five-time higher lifetime value than their less engaged peers.

Today, data and AI are transforming every industry. Databricks is dedicated to shaping the future through cutting-edge data and AI solutions and a commitment to data-driven excellence. At Databricks, we believe in the possibilities that AI brings to data platforms and resulting value for industries. Our mission has been to simplify and democratise data and AI, helping data teams solve the world's toughest problems. To that end, Databricks combines the best of data warehouses, data lakes, governance, sharing and AI to offer an open and unified platform for data and AI.

A data-driven approach and advanced analytics capabilities are essential enablers of our model, which is built on a granular understanding of customer behaviour and its effects on risk and profit. In order to enable and rapidly scale this model, we've teamed up with Databricks for their expertise in data and AI platform innovation to embed data-centric products and data-driven decisioning across our company. Leveraging data, machine learning (ML) and generative AI (GenAI) capabilities has allowed us to hyper-personalise products and client interactions, transform our service approach, and significantly enhance our actuarial capabilities, risk management and fraud detection.

In this paper, we'll demonstrate some of these impacts and explore how data and advanced analytics play a fundamental role in enhancing client financial health and driving better business outcomes.

Hylton Kallner

CEO
DISCOVERY BANK

This paper highlights the partnership between Databricks and Discovery Bank. With the Databricks Data Intelligence Platform for Financial Services, Discovery Bank accelerates data analytics and AI to drive business value, streamline governance and automate complex tasks. Our joint efforts demonstrate how data can drive transformation and add value to society. Discovery Bank's use of advanced AI and focus on data underscores its unwavering dedication to offering innovative financial tools and contributing to a brighter future for everyone.

Dael Williamson

CTO
DATABRICKS

Executive Summary

Data is foundational to Discovery Bank, manifesting in an ecosystem of data products that power applications throughout the client lifecycle and across business functions. Central to this ecosystem is the Databricks Data Intelligence Platform (DI Platform) – which combines the power of Databricks lakehouse architecture with generative AI – and allows Discovery Bank to integrate data processors, advanced machine learning (ML) models, complex actuarial models, and generative AI capabilities with streamlined governance. This has empowered Discovery Bank to rapidly advance their actuarial modelling, risk management, personalisation, servicing, and fraud approaches, yielding a significant return on investment of more than 500%.

Central to Discovery Bank’s success is their focus on client behavioural fingerprints, which define and measure client actions, milestones, pathways, and behaviours. This unique approach allows the Bank to derive hyper-personalised insights, driving initiatives such as:

- 1 An actuarial framework incorporating modern data-driven methods for product pricing, business monitoring, risk mitigation and shared-value creation.
- 2 A central personalisation engine that leverages data and AI/ML to tailor client interactions across all client touchpoints, boosting the effectiveness of these initiatives by over 80%.
- 3 Integration of personalisation and generative AI into client servicing, guiding agents with data-driven insights to improve clients’ financial health, resulting in a fivefold increase in clients performing these actions.
- 4 Enhanced fraud prevention through the use of behavioural data, personalisation, and ML, improving monitoring and response.

The interconnectedness of these data products demonstrates the effectiveness of a standardised approach to data and AI/ML. The unified DI Platform allows Discovery Bank to seamlessly drive use cases, ensuring ease, speed, and cost-effectiveness. Discovery Bank has experienced 20 times faster data processing times, five-times faster data product creation and implementation times, and increased model-building capacity to more than 300 models per day.

By using detailed data and analytics, Discovery Bank can select and price clients accurately, forecast their shared value over time, identify financially healthy actions, personalise client interactions, and mitigate client and business risk. This approach enhances the financial wellbeing of customers and society, and raises customer satisfaction and value. Discovery Bank’s shared value has grown 10% due to these efforts.

Since adopting the DI Platform, Discovery Bank has witnessed significant strides in data maturity and is committed to further innovation with new and improved data solutions. The Bank continues to embed the use of data products and data-based decisions throughout all areas of operations by making data and data products more accessible.

This case study provides a comprehensive review of how the Databricks Data Intelligence Platform empowered Discovery Bank to build a data ecosystem focused on driving shared value throughout the business.

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Revolutionising Traditional Banking Models Beyond Profits

The banking and financial services industry is experiencing a fundamental shift due to three key factors: the nature of insurance and financial risk that is inherently behavioural, technological advancements, and changing client preferences. Clients expect personalised experiences and require ease of use. Within this changing environment, banks need to transform beyond simply providing a service and generating a profit.

Discovery Bank's transformative Shared-value Banking model and underlying advanced digital capabilities embrace these trends with significant results.

1 A changing landscape

Digital transformation has forced financial institutions to adapt, leading to increased investments in technology and a more customer-centric approach. In this dynamic landscape, fintech startups and digital banking platforms have emerged as formidable challengers to traditional banks. They present innovative, user-friendly, and cost-effective solutions, disrupting long-standing banking models that have persisted for years.

2 Outdated risk models

Traditional risk models used to assess clients' credit ratings are based on their socioeconomic status, which assesses indicators such as income and qualifications. Risk frameworks that assess and account for more than just socioeconomic status and consider behavioural aspects enable banks to tailor offerings. These banks are able to provide clients with reduced interest rates on borrowings or increased interest rates on savings based on their unique behavioural patterns.

3 Embracing digitisation, financial health, and social responsibility

The rise of mobile banking apps, online payment platforms, and robo-advisors has further reshaped how clients manage their finances, diminishing the reliance on physical bank branches. Moreover, a rising trend among socially responsible banks is to prioritise not only profits but also address social issues, catering to a growing population of clients seeking more value from their financial institutions.

4 Shared-value Banking as the future of banking

In response to the transformative trends shaping the banking industry, Discovery Bank has pioneered a Shared-value Banking model that goes beyond a focus on profits. By incentivising and empowering clients to cultivate positive financial habits, the Bank initiates a virtuous cycle wherein clients, the institution and society at large reap lasting benefits. As clients proactively and responsibly manage their finances, positive value is generated for the client with higher savings levels and lower risk of over-indebtedness. In turn, the Bank gives this value back to clients through rewards and interest rates. At the same time, engaged clients drive Bank profits and, on a macro level, contribute to a more financially stable society.

Discovery Bank's Shared-value Banking model considers individual financial behaviours to understand how financially healthy clients are. Clients then get rewarded for managing their money well.



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Discovery Bank's Shared-value Banking model is delivered through a state-of-the-art app, which gives clients a simple and intuitive interface that allows them to understand their next best actions and directly links rewards to ongoing positive behaviour changes. This Shared-value Banking model has received global recognition. Fortune Magazine selected Discovery Bank as one of 54 companies worldwide that are changing the world for good in 2022.

If faced with an unexpected expense of R10,000 (\$526 USD), more than 50% of South Africans would be forced to take out a personal loan, rely on credit facilities or borrow from family or friends, while 30% are uncertain how they'd handle such an expense.

At the heart of this Shared-value Banking model is the Vitality Money programme. The programme rewards clients for managing their money well and, through this programme, the Bank drives five controllable behaviours to lower the three financial risks that lead to 80% of the reasons why individuals do not meet their financial obligations.

Analysis shows that Vitality Money is effective in incentivising clients to change their behaviours and rewarding those clients who manage their money well. Clients on Gold and Diamond Vitality Money status (the highest tiers of the programme) are 95% less likely to go into arrears within the next 12 months and have deposits 30 times higher than the average client on lower Vitality Money programme tiers.

Five controllable behaviours

- 01 Spend less than you earn
- 02 Save regularly
- 03 Insure for adverse events
- 04 Pay off your property
- 05 Invest for the long-term

Three risks

- 01 Unaffordable level of debt
- 02 Exposed to unexpected expenses or loss of income
- 03 Insufficient income in retirement

Which leads to 80%
of the reasons why individuals do not meet their financial obligations

Discovery Bank motivates clients to take specific actions to reduce risks commonly leading to financial instability.



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An Advanced Data Ecosystem with the Databricks Data Intelligence Platform: Powering the Future of Shared-value Banking

Discovery Bank has built an ecosystem of data products that focus on enhancing the client experience and generating shared value within all areas of the Bank. Data is foundational in the development of these products, as it enables the Bank to construct personalised behavioural profiles leveraging data science, actuarial science, and behavioural economics. These profiles form the centre of Discovery Bank’s data ecosystem and provide an in-depth understanding of how client behaviours impact engagement, financial health, profitability, and risk. This understanding is key to providing a secure, seamless, convenient, and personalised banking experience for clients.

The data products built within Discovery Bank’s data ecosystem leverage a centralised behavioural framework to drive applications throughout the client lifecycle, with these products built around three fundamental principles:

1

Data innovation is driven by a “data-as-product” mindset, with a data product being defined as a service that delivers value to either the business or their clients.

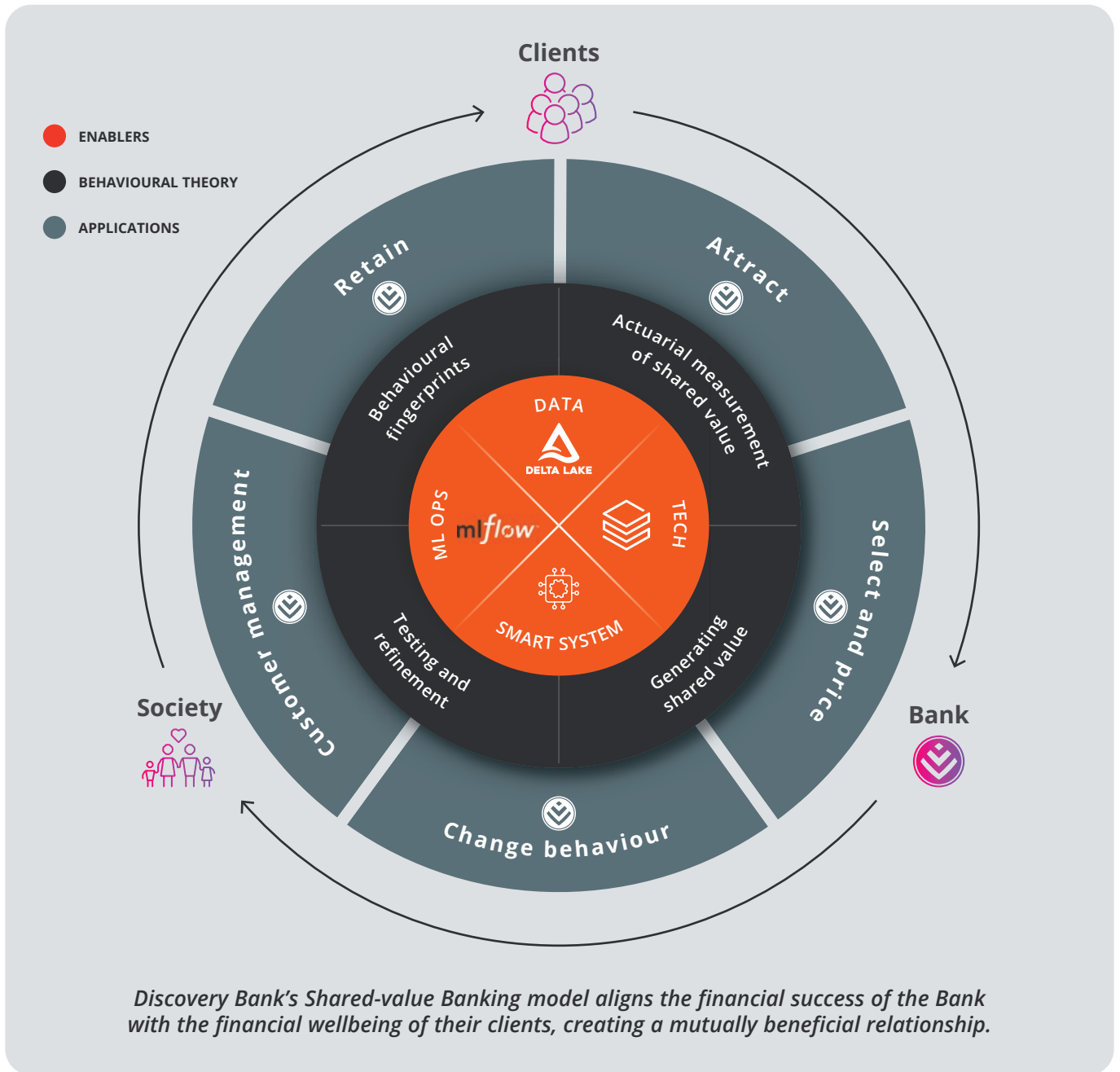
2

Data products must be measured against their effectiveness in driving positive client, Bank, and societal impact

3

Data products must integrate within an overall data ecosystem that embeds a focus on delivering shared value throughout the organisation.





Discovery Bank's data ecosystem powered by the DI Platform has transformed how the Bank's data teams create fast and reliable data products. With this platform, the Bank has unified data processing, sophisticated machine learning, intricate actuarial models, and generative AI, revolutionising key areas such as actuarial modelling, risk management, customer service, personalisation, and fraud detection.

Discovery Bank's data ecosystem has resulted in substantial client, business, and societal impact. In partnering with Databricks to deploy data intelligence throughout their organisation, the Bank has been able to gain unprecedented insights into what motivates people to form financially healthy habits. Discovery Bank is operationalising these insights within data products throughout the Bank and embedding shared-value decision-making throughout the business. Discovery Bank has seen a significant return on investment (ROI) of more than 500%.

Additional outcomes include:

20 times faster data processing times: Discovery Bank cut technical debt by empowering data teams with direct pipelines and an integrated ML framework that eliminates SQL conversions and simplifies code management. Discovery Bank realised high efficiency gains across all processes, with multiple processes that would take between three and nine hours before the migration to Databricks now running in under 10 minutes after the migration.

Five times faster data product creation and implementation times: Through simplified pipelines and end-to-end processes created on Databricks, Discovery Bank has realised a substantial reduction in the time taken to develop a data product from ideation to production. For many data products, Databricks has allowed Discovery Bank to move from a multi-week or multi-month cycle to a cycle of days.

Increased model-building capacity to more than 300 models per day: With a centralised code base and an easy way to scale, data teams can call functions for tailored model requirements already incorporated on the Lakehouse. This allows for the use of advanced ML techniques within standard data exploration and investigation processes while generating faster outputs and deeper insights. As a result, Discovery Bank has integrated model building into other processes, including data tracking and analytics, for in-depth insights in record time.

40% uplift in impact of engagement initiatives using the Next Best Action (NBA) model: The impact is measured as the uplift in shared value created through having a centralised NBA model determining what communications and interactions to assign clients across all touchpoints.

41% uplift in impact of engagement initiatives due to optimisations: This measures the uplift in shared value created through hyper-personalisation, testing and refinement, as well as optimising client interactions to provide precise opportunities to drive engagement.

Generating up to R500 of shared value per single client interaction: Unified data tracking, collaboration and accessible insights have uncovered scalable, shared-value measurements that can be optimised per client interaction via inbound calls, outbound communications, and notifications.

For example, personalisation results in a **50% to 100%** uplift vs. generic messaging, and generic messaging increased shared value by 50% compared to no messaging. Similarly, time optimisation, regardless of channel, provided a 100% uplift vs. communicating at random times.

Based on these results

Engagement initiatives generated

5.5%
more shared value per year.

NBA model generated

2.2%
more shared value per year.

Optimisations generated

2.2%
more shared value per year.

Totalling nearly

10%
more shared value per year with Databricks.



Behavioural Fingerprints: Hyper-personalised Client Profiles

Defining and measuring client actions, milestones, pathways, and behaviours are foundational in Discovery Bank's data ecosystem. The unique combination of these measures forms a client's behavioural fingerprint, which is built as a synthesis of the following components:

Client behaviours and indices: Discovery Bank has built a comprehensive data pipeline measuring client behaviours at a granular level. On top of this, the Bank has built numerous client indices that are summary measures of client behaviours, actions, preferences, or features.

Client behavioural norms: Various ML techniques are used to generate confidence bounds of typical client behaviour, allowing for potential changes in client behaviour as their engagement or circumstances change.

Client-simulated behaviours: Client behavioural norms together with ML models are used to identify client behaviours or to feed simulations in order to understand client behaviours under various scenarios. Similarity search is a further technique used to identify client profiles most similar to any given client.

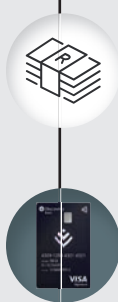
Client behavioural states: The conversion of any number of client behaviours and indices into summary states that measure the client's progression toward developing healthier financial habits. The measurement of healthy financial habits leverages client behavioural norms, client-simulated behaviours and known financial health best practice.

Behavioural profiles: The client behaviour profile related to a specific behaviour, together with the bundle of information supporting that behavioural profile. This includes client behavioural indices, client behavioural norms and client-simulated behaviours.

The combination of client behavioural profiles becomes the client's behavioural fingerprint, with these behavioural profiles being developed across a client's financial portfolio. Through the creation of client behavioural fingerprints, Discovery Bank has condensed hyper-personalised and complex client behavioural information into summary measures that provide an in-depth understanding of client behaviour. The bundled information is used within a range of initiatives to support the client's progression toward healthy financial habits.

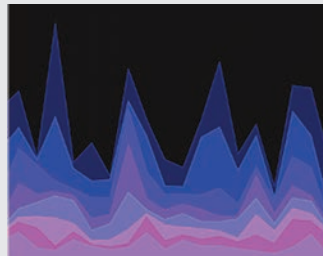
HYPER-PERSONALISATION EXAMPLE

ACTIONS AND INDICES RELATED TO SECURE PAYMENTS

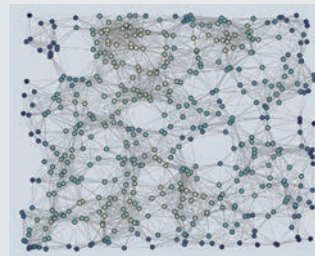


Client Daily and Monthly Spend (total, online, instore, location)	Has the client activated secure payment methods and which ones	Client Daily and Monthly Spend with secure payments (total, online, instore, location)	% spend (online, with / without secure payments)
Payment limits and related information	Category Information with / without secure payments	Brand and related information with and without secure payment spend	Client digital index, risk index

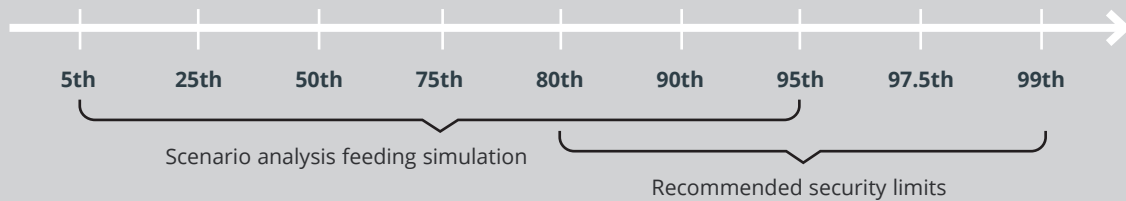
1 Various ML techniques



2 Similarity search



OPTIMAL SECURITY LIMITS



BEHAVIOUR STATE MEASURING THE USE OF SECURE PAYMENT METHODS



* Defined differently per client based on the specific client profile

Discovery Bank uses hyper-personalisation to tailor financial services to individual clients based on their unique behaviour, enhancing their overall banking experience.

An important source of information within Discovery Bank's behavioural profiles is client transactional information. Delta Lake enables Discovery Bank to integrate diverse data types from various sources, enabling advanced behavioural segmentation. This cutting-edge hyper-personalisation strategy provides a comprehensive view of customers, extending beyond standard demographics to include transactional behaviour and shopping preferences, enhancing the understanding of their banking habits.

Using Databricks, Discovery Bank identified hundreds of qualities associated with how clients spend at different frequencies and intervals. The information is enriched with a multitude of classifications – digital, geospatial, affluence, Environmental, Social and Governance (ESG), and other features to create detailed indices and measures.

TRANSACTION ENRICHMENT

By enriching client transactional data with diverse types of data we can engineer various indices that allow us to get a detailed picture of our clients and answer a broad set of questions.

WHAT DO CLIENTS SPEND ON?

- Spend types (ATM, debit orders, transfers, payments)
- Categories, sub-categories and brands

PARTNER AND REWARD SPEND

- Percentage of spend at partners by category
- Reward maximisers and earning opportunities
- Healthy spend

HOW DO CLIENTS SPEND?

- Online vs in-store
- Discovery Miles, Digital wallet, virtual cards, physical cards
- Type of card (debit, credit, primary, secondary)

WHERE/WHEN DO CLIENTS SPEND?

- Geolocation and regions
- Work-hours, after work-hours, weekends
- Domestic vs international spend

SPENDING IMPLIED TRAITS

- Luxuries vs necessities
- Affluence
- Loyalty
- Digital preferences

SPENDING SEGMENTS

- 'Jetsetters'
- 'Tech savvy'
- 'Partner loyalists'
- Many others

Discovery Bank's analytical pipeline on spend is used to drive hyper-personalisation.

The data insights, indices generated, client segmentations built, hyper-personalised actions tracked, and client behaviours modelled within the client's behavioural fingerprint create a wealth of information leveraged throughout Discovery Bank's initiatives focused on generating shared value:

- Client segmentation used within marketing design and strategy
- Business pricing and risk management
- Enhanced client servicing and fraud management
- Client behavioural change initiatives through Discovery Bank's next-best-action framework

Unified Organisational Objectives Through Machine Learning-Driven Actuarial Modelling

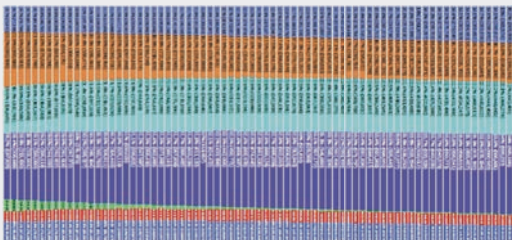
To measure and drive shared value, Discovery Bank has leveraged client behavioural profiles to build an actuarial framework that projects future client behaviour and business metrics.

With that information, Discovery Bank can create a variety of reliable paths to financial wellness based on individual circumstances and probable behaviours, rather than just socioeconomic status. These projections are used to holistically price products, track, and monitor business performance, mitigate risk and ensure a focus on the generation of shared value.

ADVANCED ACTUARIAL MODELLING IN A RETAIL BANKING CONTEXT

Membership states

- ML-driven Monte-Carlo projections of client membership states over 10-year horizon
- States defined based on a range of client behaviours
- Performed under range of business cases: prudent, best estimate and optimistic



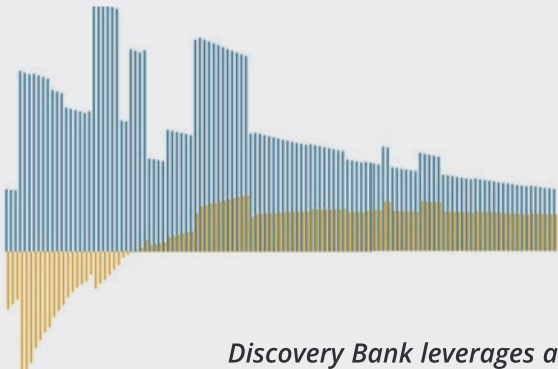
Business metrics

- Standardised framework for projecting any business metric
- Projections under multiple assumption sets and scenarios
- Allows for locked-in (budget) and automatically updated best-estimate projections



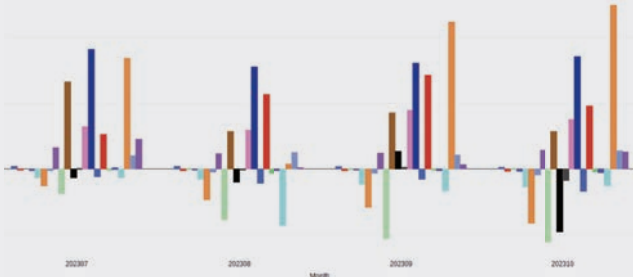
Client Lifetime Value (LTV) and shared value

- Utilises membership states and profit-related business metrics. Projected cashflows over 10-years discounted to present date at target rate of return
- Client LTV converted to a shared-value metric focused only on financially healthy behaviour



Monitoring experience

- Standardised actuarial investigation module built to track expected vs. actual experience
- Processing capability enables scaling of automated monitoring to 100+ KPIs
- Supported by a range of scheduled DataBricks dashboards for risk management and management information reporting



Discovery Bank leverages advanced data science and actuarial methodologies to create a centralised actuarial framework.

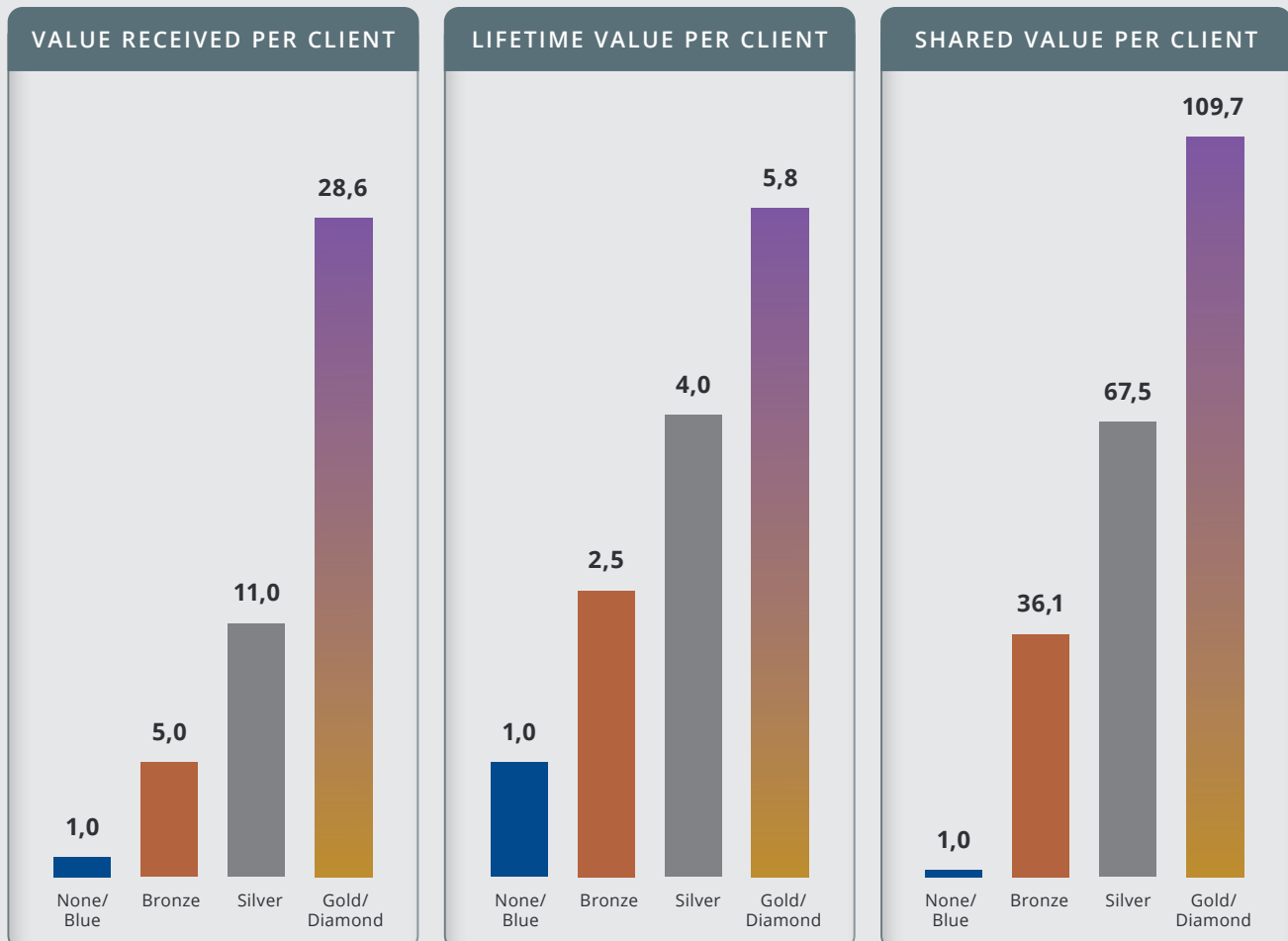
To apply traditional actuarial concepts within a Shared-value Banking context, Discovery Bank took a modern data-driven approach to encapsulate complex client behaviours and keep up with the constantly evolving nature of client needs within financial services.

Using data and ML to reduce complexity and enhance efficiency, the Bank created a shared-value index that encourages clients to make financially healthy decisions, all while optimising the value received by clients.

The framework uses the client behavioural profiles to model the correlation between client behaviours, long-term financial health, and client profitability. This allows Discovery Bank to use client actions, behaviour conversions and financial health indicators within valuation measures and for pricing and risk management.

VITALITY MONEY STATUS BEHAVIOURAL CORRELATIONS

The Vitality Money program drives a mutually beneficial relationship for clients and the Bank. Clients who demonstrate improved financial behaviour earn significantly more rewards, but also generate increased profits and lifetime value. The combined impact of this is a 109.7 Shared Value differential between clients on the highest and lowest status.



Reflects experience for transactional and credit clients between Jan' – Oct' 2023.

Client behaviour and value are highly correlated to the Discovery Bank Vitality Money status.

Equipped with integrated client and business insights, frameworks are built to drive shared-value business decisions in the following applications:

Client membership projections: Forecasts monthly Bank membership projections across various client states for each existing and expected new client. Client states are defined across the client's product portfolio, engagement, and financial health. Projections are performed under a range of scenarios: prudent, best estimate and optimistic.

Business metric projections: Project any business metric or index of value by overlaying these onto client membership projections through a standardised framework. The standardised framework allows for any metric to be added with no additional complexity. Projections are done under all membership scenarios as well as under multiple assumption sets, and scenarios related to the metric of interest.

Client lifetime valuations: Assess the expected outcomes of clients throughout their journey with the Bank, from the leads stage to the end of their relationship with the Bank. This measure is converted into a shared-value index that focuses only on financially healthy behaviour.

Monitoring experience: Using automated machine learning and accessible dashboards, Discovery Bank has automated business investigations into changes in the business as well as how actual experience differs from the expected experience and the reasons for these differences. This enables smart, data-driven decisions to address any unexpected variances. It is also used to drive marketing strategies, new products and services design, and multiple other applications that drive client lifetime value.

Initiative performance tracking: Initiatives throughout the business are measured against the value they create as determined by changes in the shared-value index to ensure alignment of the objectives and impact of these initiatives.



Personalising Individual Client Engagements

Motivating clients to take specific actions requires a personal touch that Discovery Bank delivers through their centralised ML-driven environment in Databricks. Central to the Bank's data ecosystem is a personalisation system that drives all client engagement. This system comprises the following core components:

1

ACTION LIBRARY

The action library is the list of all actions within client behavioural states that define quantifiable milestones that measure a client's progression to better financial habits.

2

NEXT-BEST-ACTION (NBA) ALGORITHM

All actions within the action library are modelled through a centralised algorithm that determines the client's next best actions. Using propensity and value models in Databricks, Discovery Bank can estimate the expected amount of shared value generated by each action. Instead of rewarding actions that are only profitable for the Bank, Discovery Bank tailors NBAs based on the shared value generated. These insights are shared through visual dashboards within the Databricks Data Intelligence Platform that make it easier to analyse the data.

3

ALLOCATION FRAMEWORK

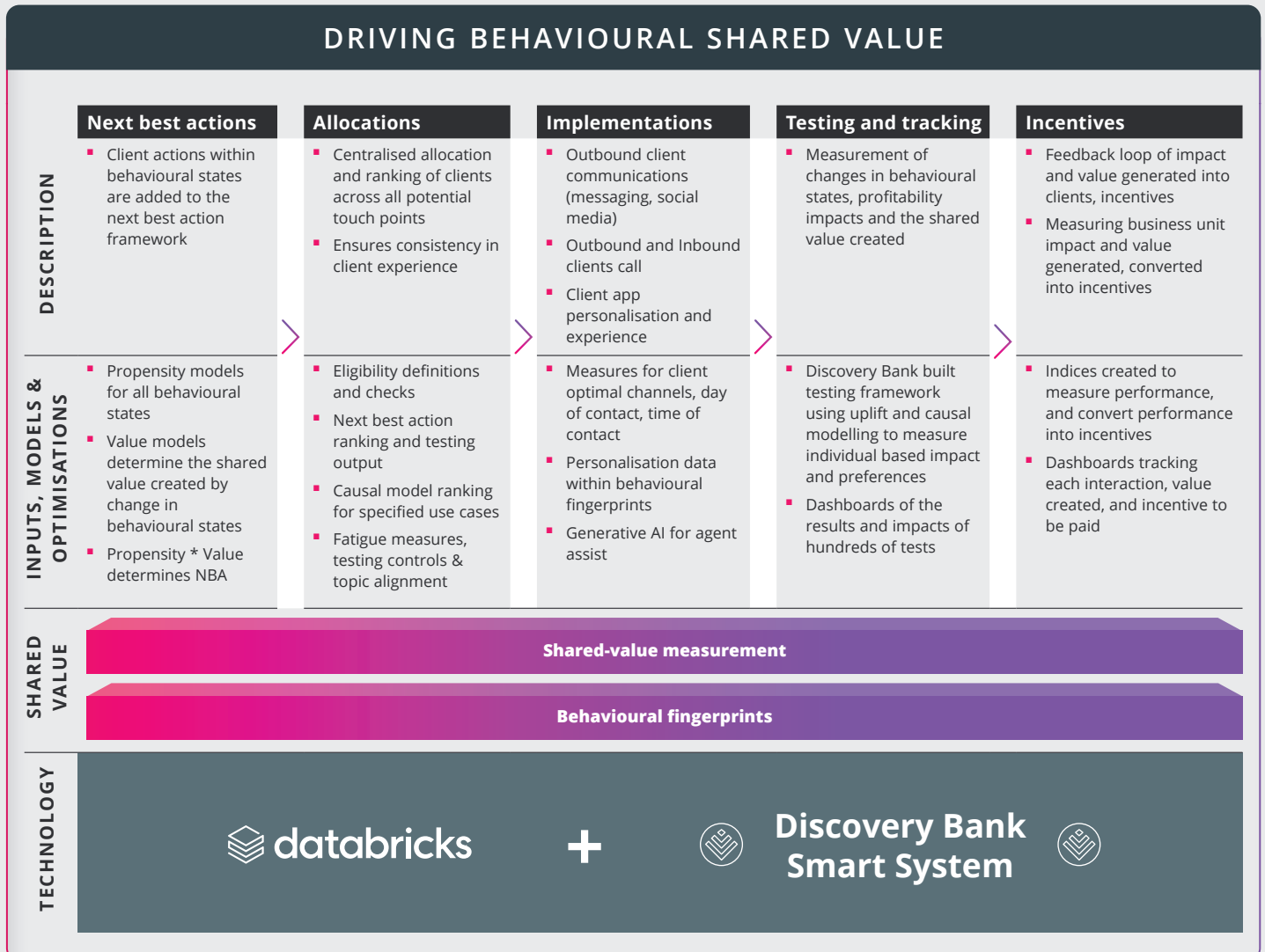
The allocation framework is a standardised framework that will allocate a client to the optimal communication or interaction available for each touchpoint within all client-facing channels. The allocation framework ensures all allocated interactions for clients are personalised and relevant across outbound and inbound communications, digital advertising, and in-app touchpoints. The allocation is driven by eligibility and fatigue rules, the NBA algorithm, the results from the tracking and testing framework, support from causal modelling, and rules ensuring consistency of themes across all channels.

Adding new touchpoints and communications to the allocation framework is straightforward, requiring no additional effort from agents, marketers, or system teams, ensuring seamless and consistent customer interactions.

4

TESTING AND TRACKING FRAMEWORK

Discovery Bank's testing and tracking framework measures all interactions or communications against whether the client succeeded in achieving the targeted milestone on their pathway to optimal financial health. This allows for the optimisation of interactions and communications at an individual level, as clients with different profiles may respond and interact differently. The framework also identifies pricing implications and incentives that will continue supporting positive behaviour.



Centralised behavioural framework driving client interactions throughout the organisation.

All workflows within the personalisation system are automated, running efficiently and at scale due to the use of the Databricks Data Intelligence Platform. Data governance throughout this system is streamlined, ensuring a comprehensive understanding and management of data. Discovery Bank maintains a unified data overview with robust governance to protect, trace, and audit data without duplication, using a single permission model.

“Having a centralised next-best-action system is critical, as it allows us to create meaningful and personalised interactions with our clients. By understanding our clients’ needs, preferences, and financial health, we can communicate our products and services in a way that is specific to a client and where they are on their journey to financial health. Our next-best-action system is not just a tool but a strategy that puts our clients at the centre of everything we do.”

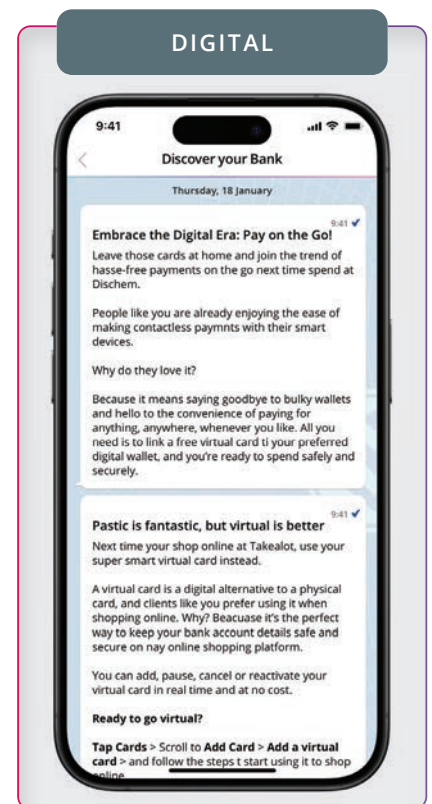
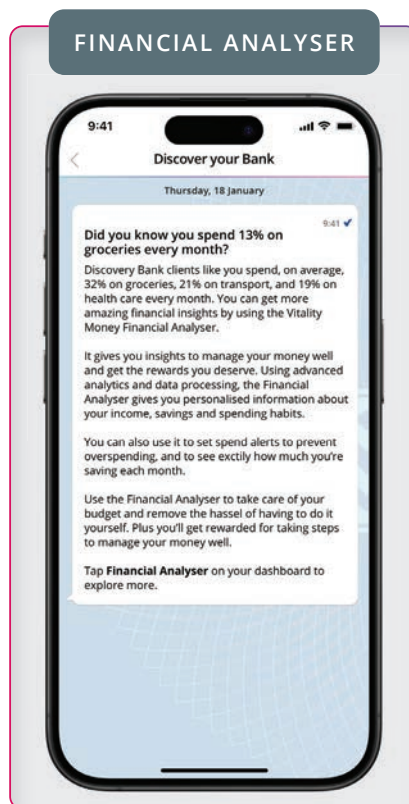
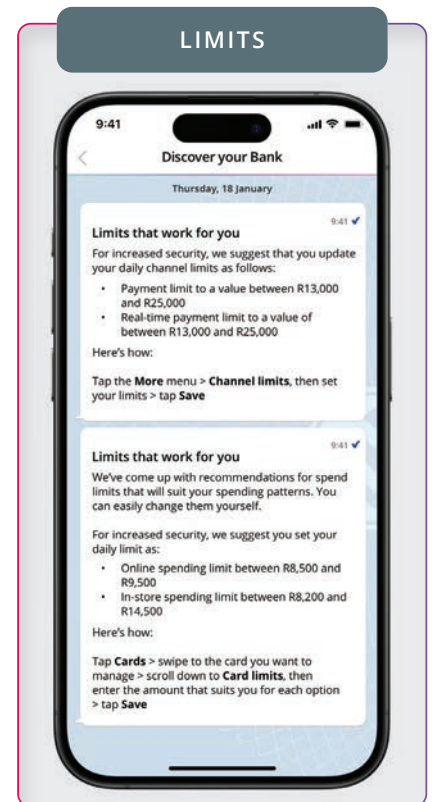
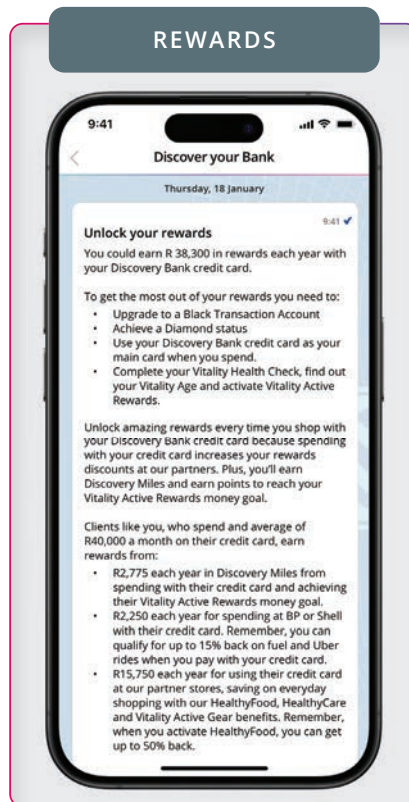
Nic Salmon, Chief Product Officer, Discovery Bank

Discovery Bank has built an implementation system that integrates with the personalisation system to deliver outbound interactions and communications to their clients. This system creates “journeys” that drive clients toward achieving the targeted milestones. A client is allocated to a journey based on the outcomes of the allocation and testing processes and is sent a journey on a client-triggered event, or at an optimal time that is expected to yield the highest level of client engagement.

A journey is a sequence of nodes, with a node representing an action to be performed, such as sending a message or selecting a path based on the outcome of certain criteria. The node selects appropriate actions based on the client behavioural fingerprint, client preferences and the propensity of that action to result in the optimal outcome.

Each journey has a natural cadence, as nodes are processed with a specific delay between them and ensure that clients remain on valid journeys. Journeys can be paused, stopped, switched to different branches, or trigger separate journeys, adjusting to changes in client behaviours.

All elements within a journey are tested and refined through the personalisation system. This provides an optimal weighting across the variations of any element within the journey based on what is most effective for a specific client profile.



Client notifications demonstrating the personalisation achieved.

Equipped with reliable answers based on the client’s behavioural profile, Discovery Bank is always motivating clients toward financial wellness. Regardless of how the Bank interacts with clients or the channels used, Discovery Bank has created custom experiences designed for shared value.

Optimising Client Servicing and Redefining Fraud Management

Building on their behavioural fingerprints, personalisation system and ML capability within Databricks, Discovery Bank is improving client services, including fraud monitoring, detection, and mitigation. Regardless of the reason for a client's interaction with Discovery Bank, the objective is to give clients the best service – that ensures an optimal client experience and that can generate shared value.

Discovery Bank has integrated their personalisation system into client servicing, both for inbound and outbound calls. Outbound calls get assigned a topic that the agent will engage a client on. The topics are ranked and allocated based on the expected shared value to be generated through the allocation library. Agents engage with clients on these topics as a proactive measure to improve the client experience and work with clients toward achieving optimal financial outcomes. In a similar way, Discovery Bank enhances the client experience on inbound calls by allocating their agents an NBA to discuss with the client. This is an opportunity to engage clients on positive behaviours that would enhance a client's financial health.

Within both inbound and outbound calls, Discovery Bank leverages generative AI within their consolidated data ecosystem to enhance services without overwhelming agents. Using hyper-personalised scripting that leverages a client's behavioural fingerprint, Discovery Bank empowers and assists agents with AI-generated communication templates that can accelerate resolutions and better achieve the associated NBAs.



“Equipping agents to speak to our clients about the best action to optimise their banking experience and financial health has been a tremendous success for both the agents and our clients. We have seen higher client satisfaction ratings on these calls as they receive faster and more personalised solutions. We have also seen a significant improvement in agent sentiment, as they feel more empowered and motivated to deliver excellent service. This initiative has shown us the importance of challenging our agents with a measurable shared-value metric and giving them the tools to meet this goal.”

Phuti Sebidi, Head of Client Servicing, Discovery Bank

Discovery Bank focuses on understanding client-provided feedback during these interactions to optimise their product offering, NBA-based recommendations, and agent-provided call assistance. This ensures an optimal client experience and is done through organic client feedback during calls as well as tailored questions provided to an agent. This feedback is important data that Discovery Bank leverages to ensure continuous innovation that is focused on the needs of their clients.

DISCOVERY BANK INBOUND NBA



Client/Next best action
Do you want to engage with the client on their next best action?

Yes No

[Live Assist](#)

Personalised script to support the agent's conversation

<p>Next best action: Activate or spend using secured payment methods</p>	+	<p>Clients' engagement relative to similar clients</p>	+	<p>Explanation of how to do the next best action</p>
<p>Status of next best action: Client never engaged with secured payments but has them currently setup.</p>	+	<p>Recommended milestones for the client to reach optimal financial health</p>	+	<p>Explanation of why to do the next best action</p>

Data

- 1 Document store
- 2 Next best action
- 3 Behavioural fingerprint
- 4 Vector Search

Generate script

- 1 Prompt using client data, and relevant documents
- 2 Generative model to create agent script

Track and monitor

- 1 Testing, tracking and optimisation
Track the effectiveness of call through Discovery Bank's tracking framework
- 2 Agent performance tracking
Track agents and teams against targeted shared value generated
- 3 Agent incentives
Engagement further encouraged by incentives for call centre staff members

Discovery Bank uses data-driven insights to determine the next best action for their clients, offering personalised recommendations and services to optimise their financial wellbeing.

Through the above initiatives, Discovery Bank has focused on converting an area that would typically be considered a cost centre into a profit centre. Discovery Bank's centralised tracking and measurement capability measures the shared value created through these client interactions and rewards their agents for that value generation.

Going forward, Discovery Bank is focused on leveraging the generative AI capabilities inherent in the Databricks Platform to deliver on new production use cases at scale, including enhancing agent support across all servicing channels and all customer queries. This functionality sources reliable responses from internal databases to resolve issues quickly, providing faster and more accessible resources to agents assisting clients in support of Shared-value Banking.

Similar to how Discovery Bank identifies and encourages positive behaviours for financial health, they can also identify negative or out-of-the-norm behaviours and flag them accordingly. This demonstrates the value the Databricks Platform provides in helping the Bank take a standardised approach to data, creating a common format that is unified within the same platform, and offering the necessary levels of governance to ensure safe and secure connections to these data domains.

Actuarial initiatives also support agent operations through call visibility:



Call forecasting for resource planning and allocation.



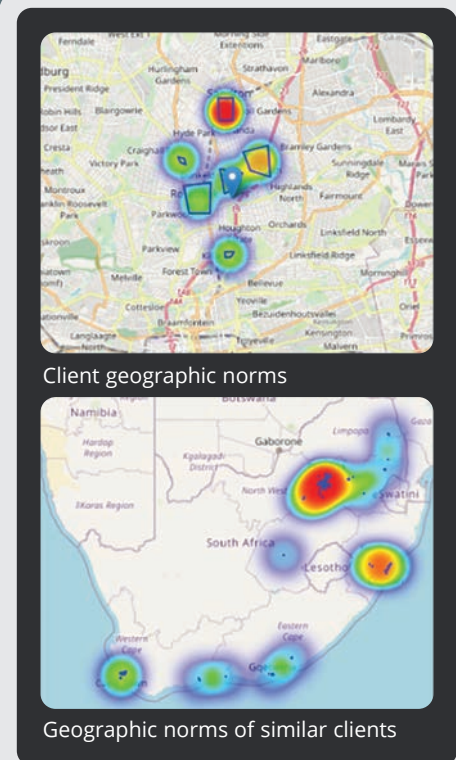
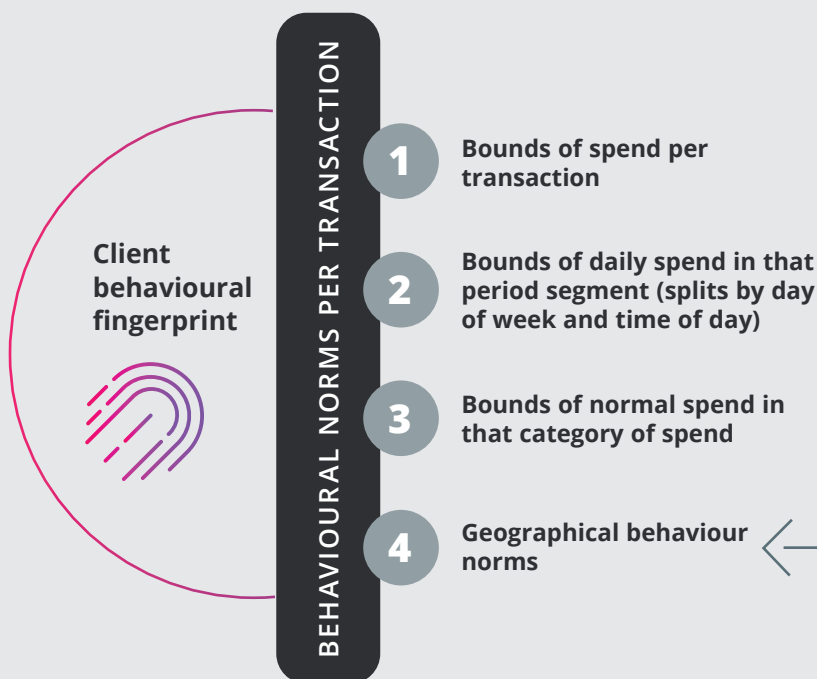
Call monitoring to assess agent effectiveness.



Call sentiment analysis to understand clients and improve interactions.

Using the same personalisation and methodologies used to communicate with clients, the Bank can now protect clients from potential fraud and unhealthy behaviours using various data points like geolocation, spending history and account activity.

With this information, Discovery Bank can assess security risk, help individual clients resolve any issues and mitigate future risks.



Driving Shared-value Banking with the Databricks Data Intelligence Platform

Discovery Bank chose to standardise and consolidate their data, ML and AI on the unified Databricks Platform to drive use cases with ease, speed, and cost-effectiveness.

On the user-friendly, high-performing, fully managed platform, Discovery Bank gets a comprehensive view of their data and transformative technology within a centralised ecosystem.

Furthermore, with the adoption of Open Banking in many Commonwealth countries, support for open-source data formats and a secure access layer is paramount to ensuring an

infrastructure that is future-proof, as regulatory considerations continue to evolve and shape the banking industry.

Having a centralised data ecosystem on Databricks has allowed Discovery Bank to integrate data and ML into applications across the client lifecycle. With these granular insights and data-driven applications, Discovery Bank can more accurately select and price clients, project and model the lifetime value of clients throughout their lifecycle, boost engagement through personalisation, and mitigate individual client risk by identifying irregularities and unsafe behaviours. These improvements not only support individual financial health and societal health but also increase the lifetime value of the client and improve client satisfaction.

DATA AND ML ECOSYSTEM | APPLICATIONS

1

ATTRACT

- Leveraging predicted share value in marketing strategies
- Simplifying onboarding journeys through tailored pathways
- Automating onboarding steps through data rather than client declared information

2

SELECT AND PRICE

- Tailored product recommendations considering a client profile
- Rate pricing considering client risk

5

RETAIN

- Focus is on upper-funnel client experience
- Data-driven assistance for clients that may be lapsing due to sub-optimal usage of their products

4

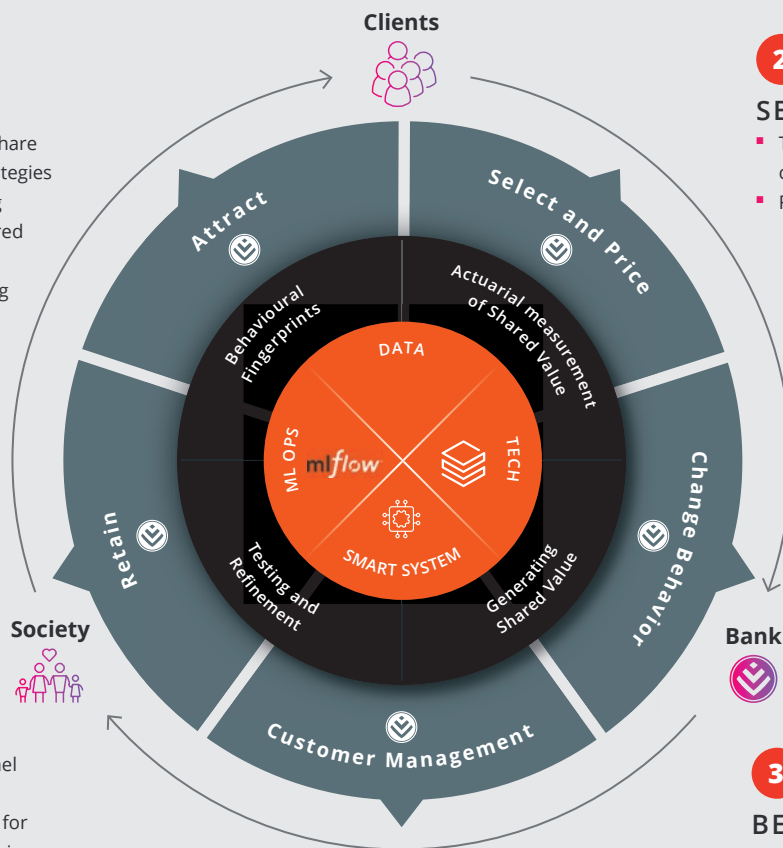
CUSTOMER MANAGEMENT

- Fraud, security is around client management
- Risk management
- Digital offering, enhanced service experiences

3

BEHAVIOUR CHANGE

- Centralised allocations of communications and interactions across all client touch points
- Embedding of shared value measurement into all initiatives
- Cross-sell relevant products tailored to a clients need and risk profile



The Databricks Data Intelligence Platform powers Discovery Bank's smart ecosystem, integrating data and personalisation with precision, reliability, and security.

Solving the Need for Fast and Efficient Analytics to Effectively Deliver Discovery Bank's Data Ecosystems

Before consolidating their data ecosystem on the Data Intelligence Platform for Financial Services, Discovery Bank relied on a traditional, on-premises data and technology ecosystem that was not geared for advanced analytics. The migration to Databricks transformed Discovery Bank's ability to leverage advanced analytics in the way required to support their Shared-value Banking model. The key enabling capabilities are:

Single, integrated environment

Data processing, modelling, serving and dashboarding are all done in a single environment, ensuring a seamless end-to-end process for business use cases.

Collaboration within and across teams

Having the entire end-to-end process for business use cases in a single, collaborative environment allows teams to work effectively and jointly on applications. The need for detailed handovers and specs between teams is greatly reduced.

Simplified data processing

The Databricks environment can easily cater to large volumes of data that the on-premises infrastructure was unable to manage. This allowed for the migration from highly coupled data processing pipelines to simple, fast, and more efficient pipelines that are easier to debug, easier to sequence and less prone to failures.

Integration of programming languages

Databricks provides native support for working with multiple programming languages to deliver use cases end to end. This results in highly effective pipelines that are easy to deploy to production. In addition, this allows for comprehensive and integrated code bases, simplifies maintaining code, and avoids the accumulation of technical debt.

Governance risks

Managing data and code quality within the traditional ecosystem was complicated and required a large degree of bespoke development. Databricks provides comprehensive functionality to ensure cohesive data, ML models and code governance practices.

Access to advanced ML tools

Databricks provides access to advanced ML tools that support the custom requirements for specific ML models required to drive shared value. This reduces risk in production management and versioning from downstream impacts causing an upstream error.

Accessible business insights

Given the fast and integrated data ecosystem Databricks has enabled, business and technical users are able to consume insights in an optimal manner, resulting in faster decision-making. Dashboards are refreshed regularly and are intuitively integrated into pipelines, enabling automatic decisioning within these pipelines.

As a result of these advantages, Discovery Bank's data and ML teams are no longer required to invest excessive time and effort into managing the complexity of a distributed ecosystem that requires workarounds to continue driving shared value. These efficiencies resulted in an exponential increase in time to insights, time to production and ultimately, data-led innovation that is dramatically changing the ROI of Discovery Bank's data environment. The cost and inefficiency of Discovery Bank's on-premises environment would have become unsustainable as the company scaled, and unification on the Data Intelligence Platform for Financial Services has proven to be the answer.

“Databricks has transformed our ability to build the centralised ecosystem we need to drive shared value. It is simple to use, fast and easy to manage. It integrates everything we need into one consolidated platform, without dependencies. It just works. It enables small teams to build higher-quality data products quicker and at a lower cost than anything else we tried or were doing before.”

Stuart Emslie, Head of Actuarial and Data Science, Discovery Bank

Maximising Productivity with Advanced Tooling Integrations

Standardising data and processes from disparate locations can be risky if done improperly because of the interconnectedness of the Discovery Bank data ecosystem. An error in one process or model could impact the performance of other processes and models. The comprehensive tooling integrations within the Databricks Platform have enabled Discovery Bank to mitigate this risk, building a data ecosystem that is secure and reliable.

Data processing and transformations

Discovery Bank has consolidated their analytical and ML data pipelines into Linux Delta Lake, from which the Discovery Bank data ecosystem is built. The open-source storage framework allows data teams and analysts to leverage data assets for ML models, streamline and automate data processing pipelines, and create centralised features that can be repurposed and customised for different models. These capabilities reduce the efforts required in maintenance and management of the code base and pipelines, saving significant time while simultaneously supporting cross-team collaboration.

Without Databricks, some data processors could only be run monthly, taking hours. With Databricks, it takes minutes for processors to run, providing up-to-date, comprehensive business insights and features to be used in models.

Machine learning model management

Discovery Bank migrated all ML models and the management of these models to Databricks using Linux MLflow. Due to the dependency of multiple processors on a single ML model as well as the dependency of some ML models on the output of upstream models, errors, and drift in one model can cause large unintended changes in downstream processes. MLflow makes it easy for data practitioners to tailor model requirements for governance and to ensure model quality.

Data teams also manage model histories, versioning and data products using MLflow together with standardised data and model tracking to maintain both data and model integrity and performance. Discovery Bank is planning on migrating this standardised data and model tracking to Databricks Monitoring. This is anticipated to provide substantial benefits due to the interconnectedness of the Discovery Bank data ecosystem.

Code registries and development

Processing tasks, including data transformations and model management, occur in integrated Python, PySpark and SQL pipelines. Breaking the development language barrier through this integration, data teams and individual practitioners have similar tooling for collaboration to accelerate outcomes with shared data and insights.

To support these integrated pipelines, Discovery Bank has built a tailored code base for core functions and applications used throughout their data ecosystem. This code base incorporates Discovery Bank's custom requirements to ensure speed, consistency and reliability when embedding advanced ML applications into all data products. An example of this is using the same custom functions within the creation of behavioural fingerprints, projections, and analysis of surplus within the actuarial framework and the NBA framework.

Cluster policies define different-sized clusters for different use cases. These predetermined automations enhance productivity by enabling data scientists and engineers to create and activate clusters relevant to their use cases, reducing reliance on MLOps to create custom clusters.

End-to-end orchestration and automation

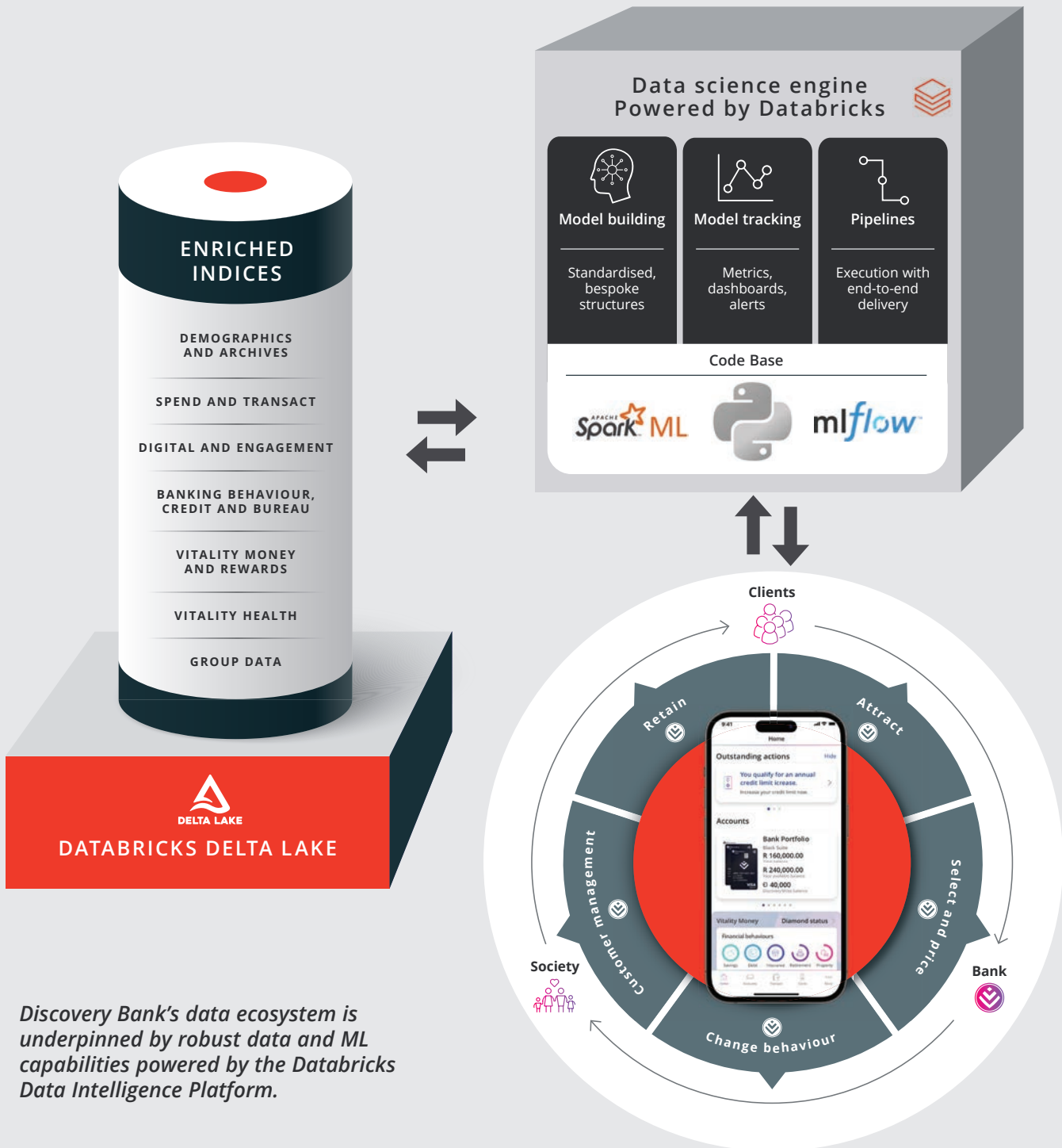
Databricks workflows orchestrate data processing, ML, and analytics in the platform and, with this, Discovery Bank constructs and automates their data ecosystem. The full MLOps cycle is embedded into these workflows with complex ETL pipelines feeding feature engineering pipelines, which in turn, feed model training and model execution on top of which sit post-processing and serving pipelines.

Discovery Bank has chosen Databricks dashboards over alternatives for all their data products because of their ease of use and the desire to reduce multiple copies of data. Having used alternatives, Discovery Bank has seen efficiency benefits with Databricks through reduced dependencies and simplicity.

With complete data processing, data transformations, model training, model management, model implementation and dashboarding on Databricks, Discovery Bank is building seamless pipelines that run automatically, frequently and quickly. Discovery Bank data teams are now able to experiment, develop and deploy advanced analytics solutions quickly, reliably, and frequently.

Partner integrations

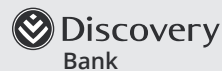
To interact securely with both internal and external partners while protecting consumer privacy, Discovery Bank is exploring the use of Linux Delta Sharing. Given Discovery Bank's Shared-value Banking model, the Bank works in conjunction with partners to offer clients optimal rewards. Delta Sharing is an open standard for secure data sharing, regardless of computing platforms, with security and governance, scalability, and live-data sharing – moving the Bank away from slow and error-prone SFTP protocols.



Reinforcing Governance and Security Through the Databricks Data Intelligence Platform

The governance and security protections embedded in Databricks have substantially reduced Discovery Bank's time from ideation to implementation, thereby lowering costs, accelerating outcomes, and driving data with confidence. The simplification of system administration and data management removes all barriers to the fast delivery of data products. Leveraging high volumes of implementation cycles, Discovery Bank can scale as needed with trust to reduce risk.

Within the Data Intelligence Platform for Financial Services, Discovery Bank uses the medallion architecture, establishing Bronze, Silver and Gold layers for different use cases. Using automated workflows to schedule ETL pipelines, the Bank quickly consolidates raw data from various sources into the correct level for the corresponding use case and prepares it accordingly. For data and AI governance on the platform, Discovery Bank has migrated to Unity Catalog to manage lineage, table history and access controls.



About Discovery Bank

Discovery Bank is part of Discovery Limited, a financial services organisation that operates in healthcare, life assurance, short-term insurance, investments, banking, and wellness industries, in over 40 markets globally

Discovery Bank is fundamentally designed to create unique shared value for clients, differentiating the Bank from traditional banking models. Clients are encouraged to manage their money well, monetising healthy financial behaviours that lower their financial risk and realises long-term default and risk savings for the Bank. Discovery Bank shares this value with clients in the form of better interest rates, deep discounts and significant rewards. The model has an overall positive impact – clients experience greater financial wellbeing, the risk of defaults for Discovery Bank is lowered making the business more sustainable; while improved financial behaviours such as increased savings, higher retirement savings and lower debt levels, benefit society as a whole. Behaviour change and rewards are enabled through Vitality Money, an AI-powered programme on the Discovery Bank app that gives clients an understanding of the behaviours that influence their financial wellbeing, while giving them the tools to improve their financial behaviours.

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About Databricks

Databricks is the data and AI company. More than 10,000 organisations worldwide – including Comcast, Condé Nast, Grammarly and over 50% of the Fortune 500 – rely on the Databricks Data Intelligence Platform to unify and democratise data, analytics, and AI. Databricks is headquartered in San Francisco, with offices around the globe, and was founded by the original creators of Lakehouse, Apache Spark™, Delta Lake and MLflow. To learn more, follow Databricks on LinkedIn, X and Facebook.