



Data Science

FEBRUARY 2020

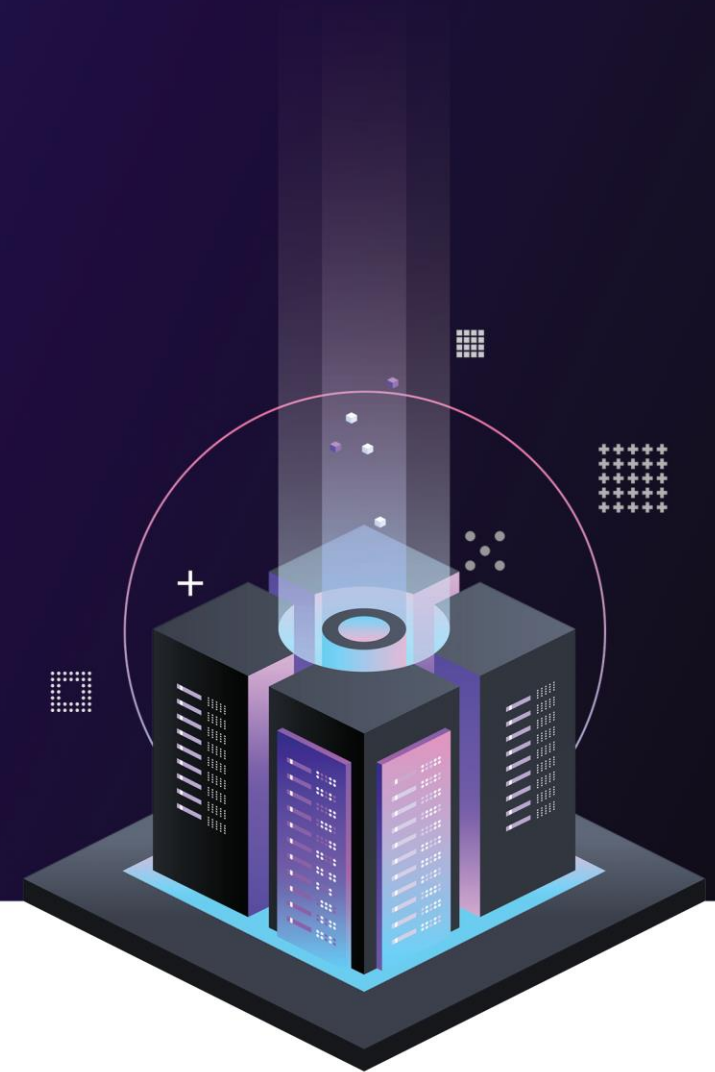



Table of contents

Data Science

F E B R U A R Y 2 0 2 0

1. Our view of the market
 2. What information lies within the client's transactional data
 3. The next generation of credit scoring
 4. Transforming fraud detection
 5. Loan origination experience
 6. Our team
- 

Our view of the market

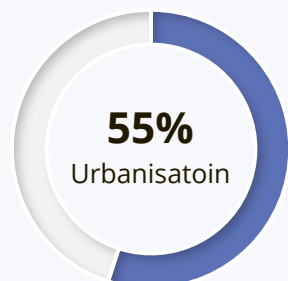
Digital around the world vs Africa - Jan 2020

● World ● Africa



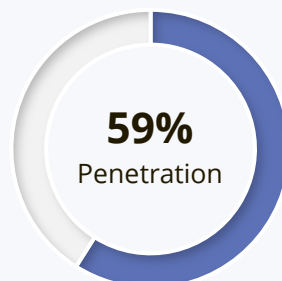
Total population

7.75 billion



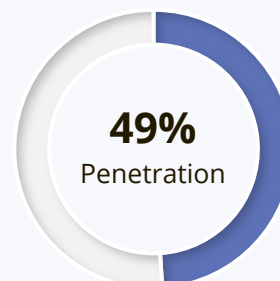
Internet users

4.54 billion



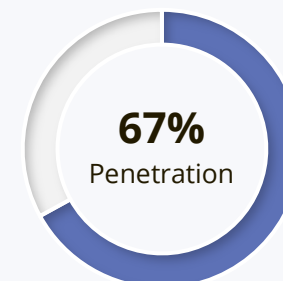
Social media users

3.80 billion

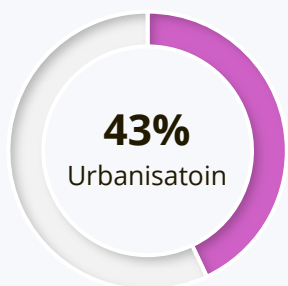


Unique mobile users

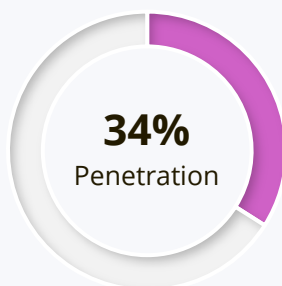
5.19 billion



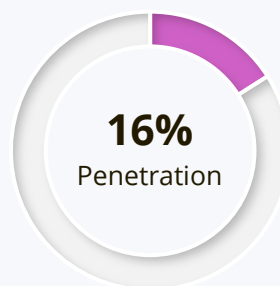
1.32 billion



453.2 million

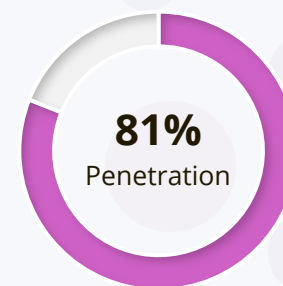


217.5 million



Mobile connections

1,08 billion



Future of Fintech

Key trends

50%

Percentage of global payments predicted to flow through FinTech channels by 2022 (McKinsey)

\$200m

Investments poured into RegTech companies since 2017 (FinTech Global)

80%

Percentage of large banks set to support FinTech's application development through open banking

50 B

Number of devices to be connected to the internet (IoT) by 2020 (Cisco)

“ FinTech's currently lack the ability to scale due to a lack of brand recognition. This is all set to be a thing of the past once they partner with banking leaders. ”

AI solutions

Sales lab

Scrutiny of clients' personal data to optimise leads and define quality and well as which clients are more likely qualify and convert into a sale.

Score lab

Supervised machine learning to make predictions within seconds. Using financial and psychometric data allows faster more accurate decision making, greatly improving the speed of loan application processes as well as user experience.

Offer lab

Transactional behaviour modelling creates opportunity to up-sell, cross sell and identify where improvements can be made on spending habits with product expansion possibilities.

Risk lab

Seamless provisioning modelling allowing inputs from all other modules delivering IFRS9 compliant models with scenario analytics for macro-economic and SIC-R impact assessments and implementations

Lender lab

Reduce risk, eliminate human error, improve turnaround time and improve over all customer experience.

Fraud lab

Identify organized groups of fraudsters, synthetic identities, stolen identities, compromised networks and hijacked devices.



**What information lies within the client's
transactional data?**

Transaction Modeling Engine

Offer Lab

- ⌚ This is an **AI classifier** that identifies different transactions based on their descriptions using advanced algorithms and feature engineering.
- ⌚ **Automated classification and analysis** of transactions ensure consistent and fast results compared to manual processes.
- ⌚ Transaction data is a **rich source of information** and can be utilised for further modelling problems, including credit scoring.
- ⌚ Transactional behaviour modelling creates opportunity to up-sell, cross sell and identify where improvements can be made on spending habits with product expansion possibilities.



The data modelling process



DATA SOURCES



Source: Document

- OCR data extraction
- Metadata extraction

Source: API's

- Direct from bank



PROCESS

DB



Classifier

Labels transactions



Analysis

Report details & stats



CONSUMERS



Credit scoring

- Predicts possibility of defrauding

Affordability

Loan application processing

Fraud

Anomaly detection

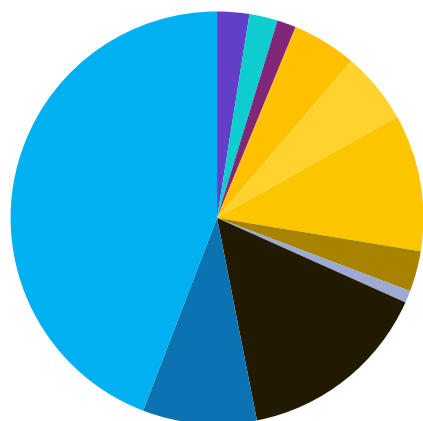
Easily plugged into any flow or process | New sources such as open banking data can be fed into the pipeline | New consumers are easily added

Anomaly detection as example



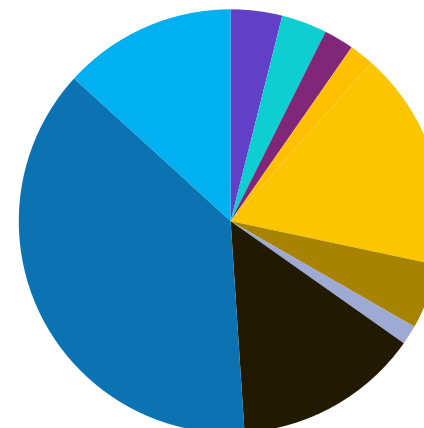
Knowing that the distribution of transaction categories follows a Zipfian distribution, a spending profile such as the one on the right, where cash withdrawals make up more of the total debits, may be flagged as suspicious.

Normal profile >



- Cellphone
- Fuel
- Insurance
- Subscription
- Vehicle
- Uncategorized
- Clothing
- Groceries
- Loan
- Utilities
- Cash

Anomalous profile



- Cellphone
- Fuel
- Loan
- Utilities
- Cash
- Clothing
- Groceries
- Subscription
- Vehicle
- Uncategorized



Automating affordability

Calculating the remainder of a client's money after paying necessary bills and obligations.



Understanding the spending behaviours

Learning from spending behaviour to accurately predict a client's probability of defaulting on a loan.



Defining the norm and detecting fraud

Modelling normal spending patterns and flagging a client too far removed from the norm.

Transaction Modeling Engine

Offer Lab

- ☀ Models are country/context specific.
- ☀ South African model used by GetBucks SA.
- ☀ Used for automated affordability calculation and credit scoring.
- ☀ 30 categories used for identifying recurring (and non-recurring) expense and sources of income.
- ☀ South African model created with ~270 000 transactions.
- ☀ High performance model with scores up to 98%.



Model building

- ☀ Labelled real world transaction data required for training new models.
- ☀ Amount of labelled data required depends on:
 - Nature of data (homogeneity, text nature, etc.)
 - Amount of categories required
 - Accuracy requirements. (More data, more accuracy)
- ☀ Fractal labs data science team analyses data and determines best model building strategy and data requirements
- ☀ Example: Very homogeneous data, 20 categories: 5000 labelled examples





The next generation of credit scoring

Affordability and risk forecaster

Score Lab



- ⊗ A **fully autonomous AI credit scoring system** that is capable of assessing the risk of clients applying for loans with the purpose of reducing loan default rates.
- ⊗ Uses a **supervised machine learning** algorithm trained on both traditional financial data as well as alternative data sources such as sms messages and social media data.
- ⊗ Not only does Jessie decline or approve a loan, but also offers a client a **range of products** consisting of affordable loan amounts and terms to choose from.
- ⊗ Can extract data and **make predictions within seconds**, greatly improving the speed of loan application processes as well as user experience.



The system is used in many countries for credit scoring and is designed in such a way that a new model can be easily trained and deployed in another country.

Affordability and risk forecaster

Score Lab



Multiple Data Input Sources

- Existing Loan
- Employer
- Social media
- Credit bureau
- Bank Statements
- Mobile device
- Psychometric

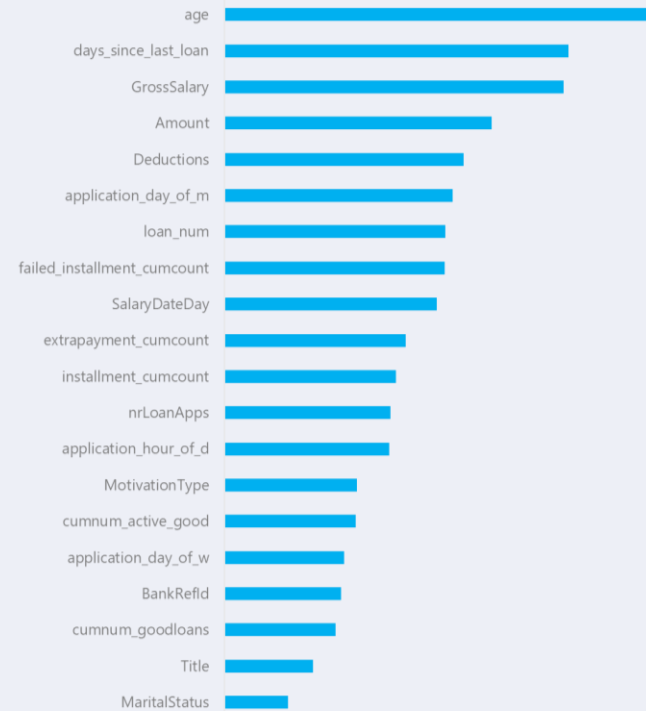
Out is a model to predict probability of default (PD)



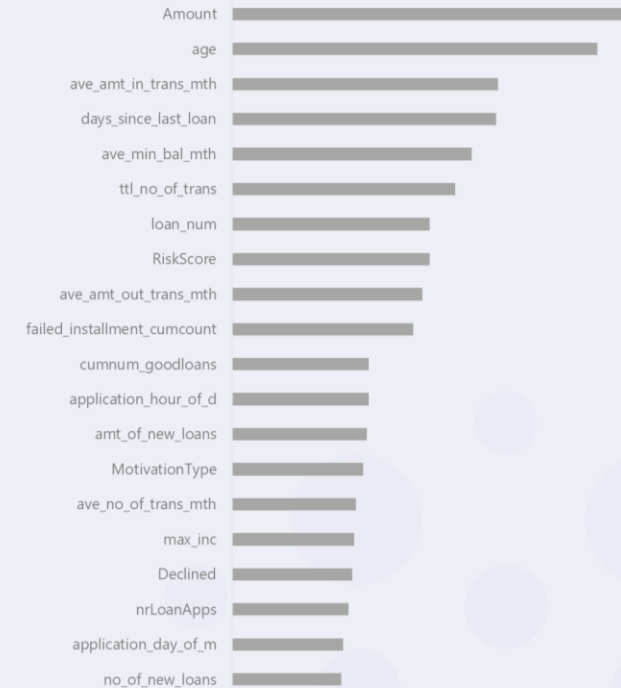
Predictive behaviors in different geographies will differ



Country A



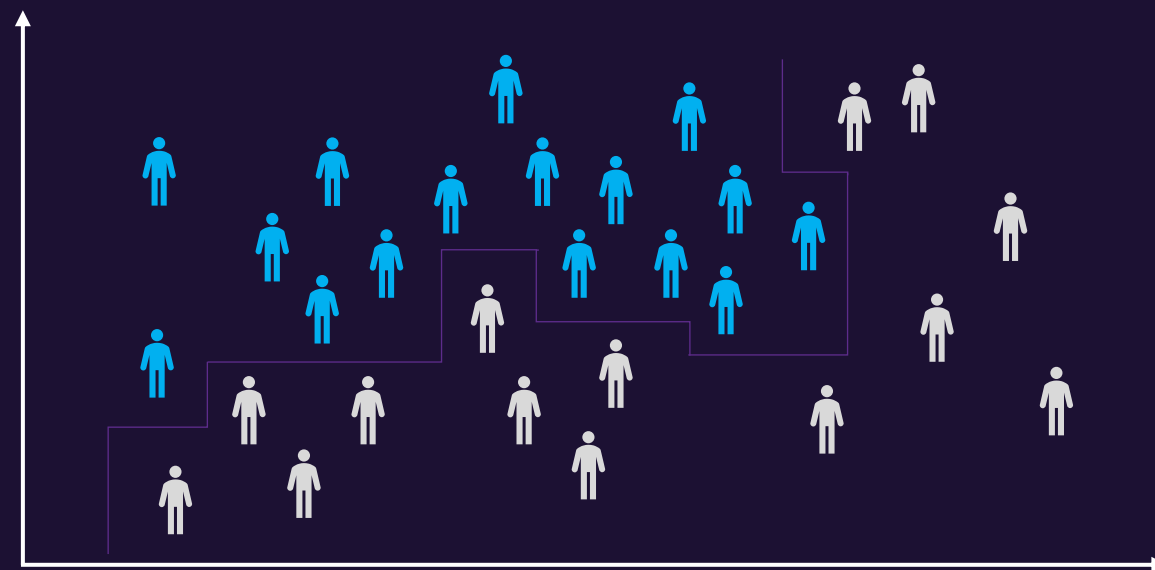
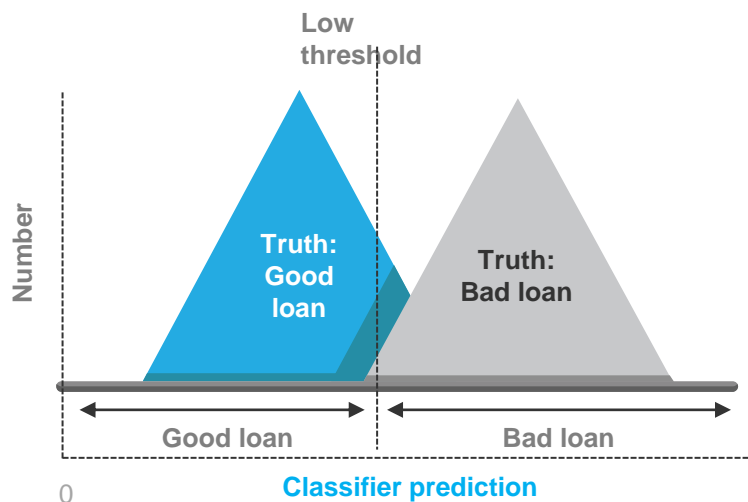
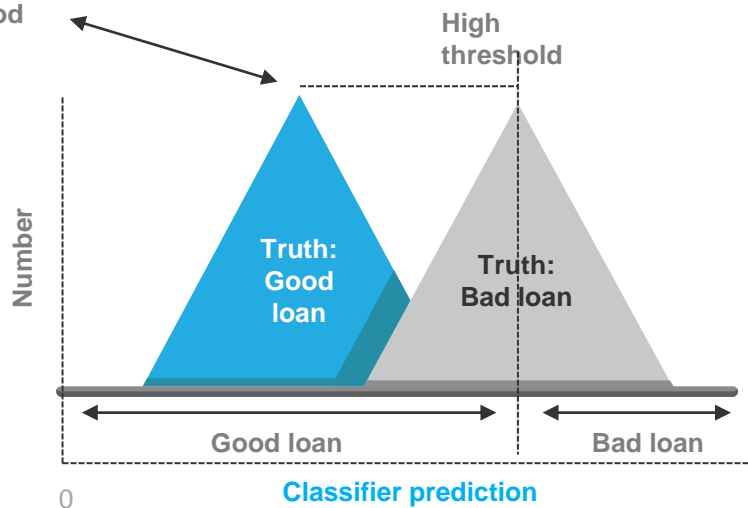
Country B



Affordability and risk forecaster

Score Lab: How do we accomplish this

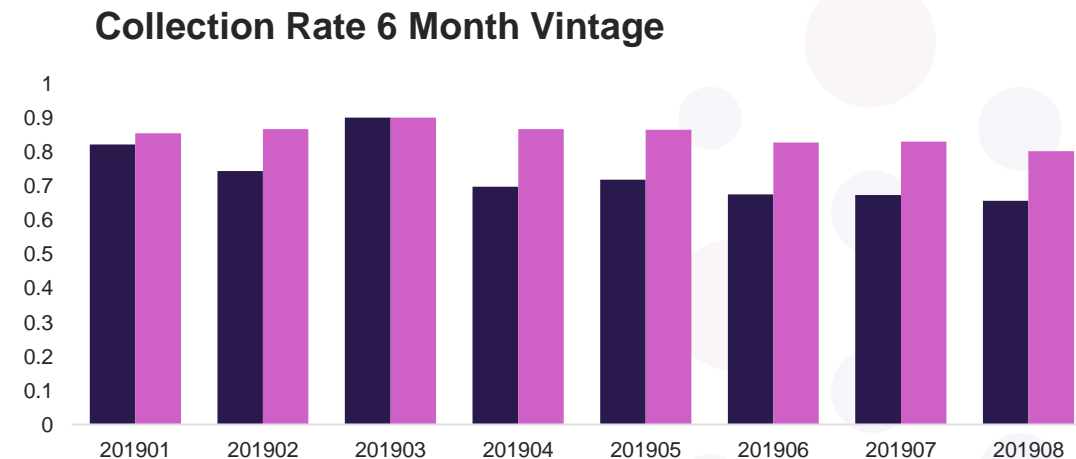
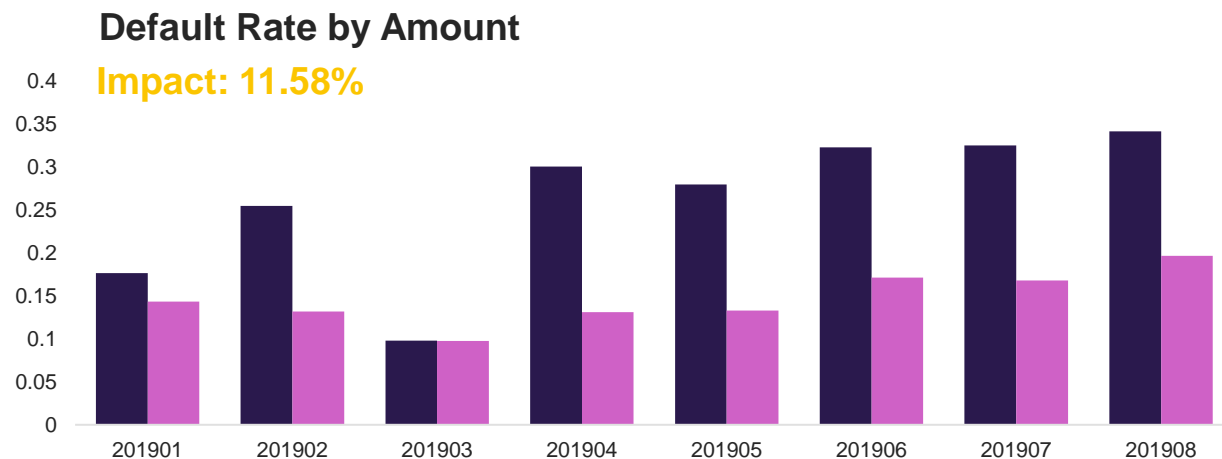
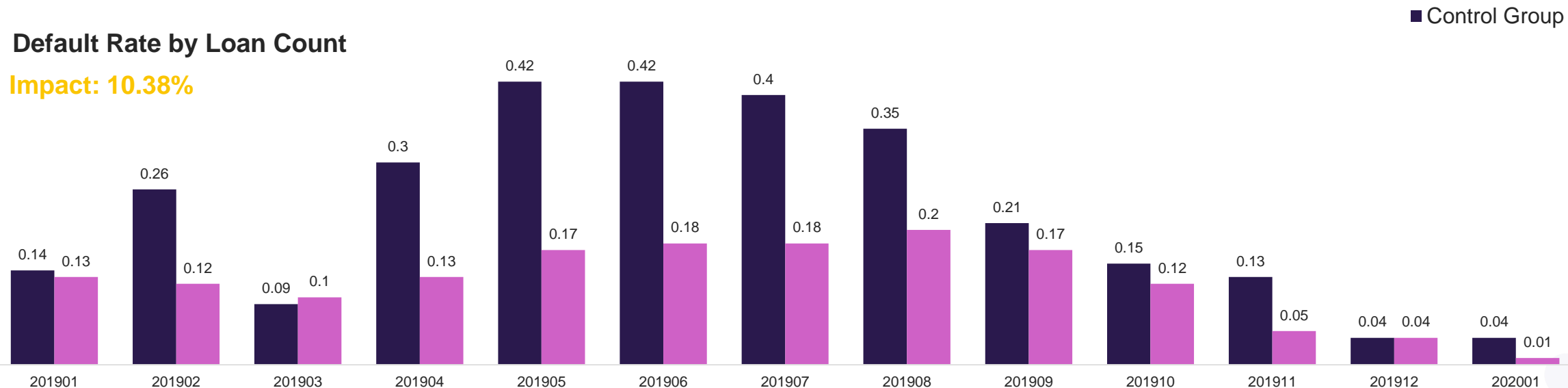
Classifier ability to distinguish **good loan** from **bad loan**



- Realtime classification across all products the client can afford.
- Links to any platform via API, and directly to SQL backend returning results.
- Client is then presented with only products he/she can afford.

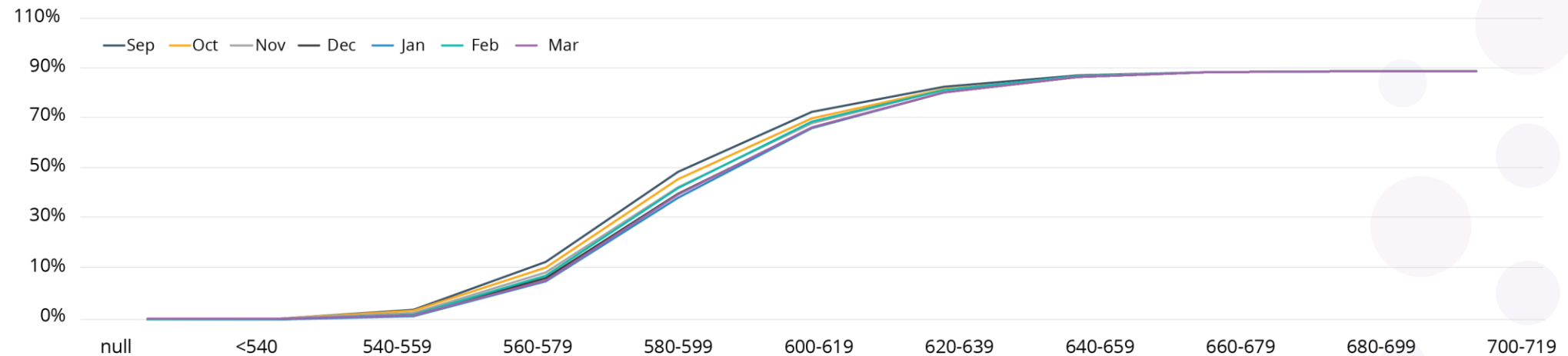
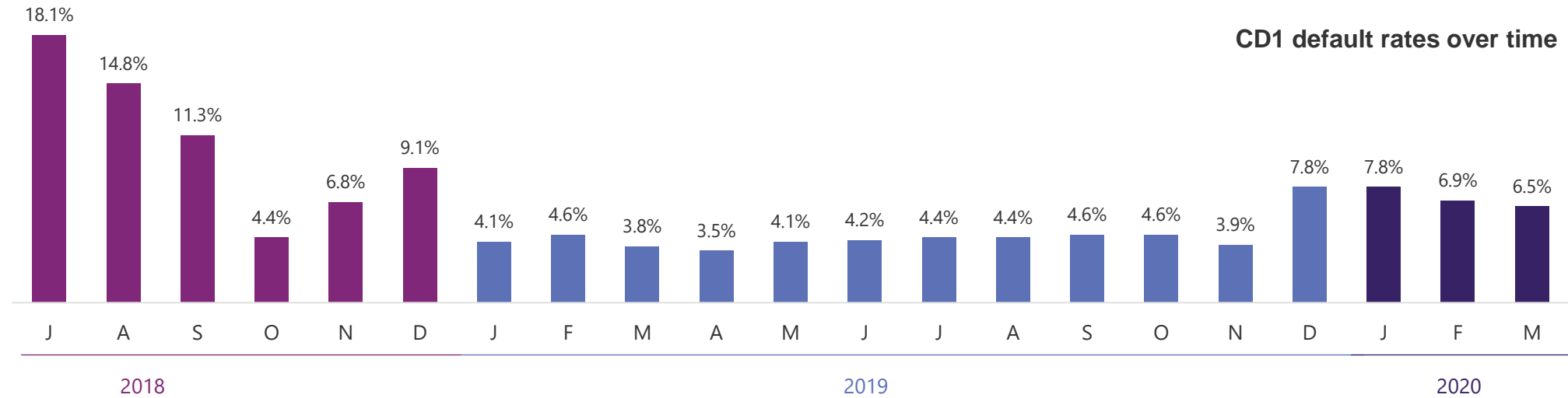
Affordability and risk forecaster

Score Lab: A real example of the default rate lift that we have experienced



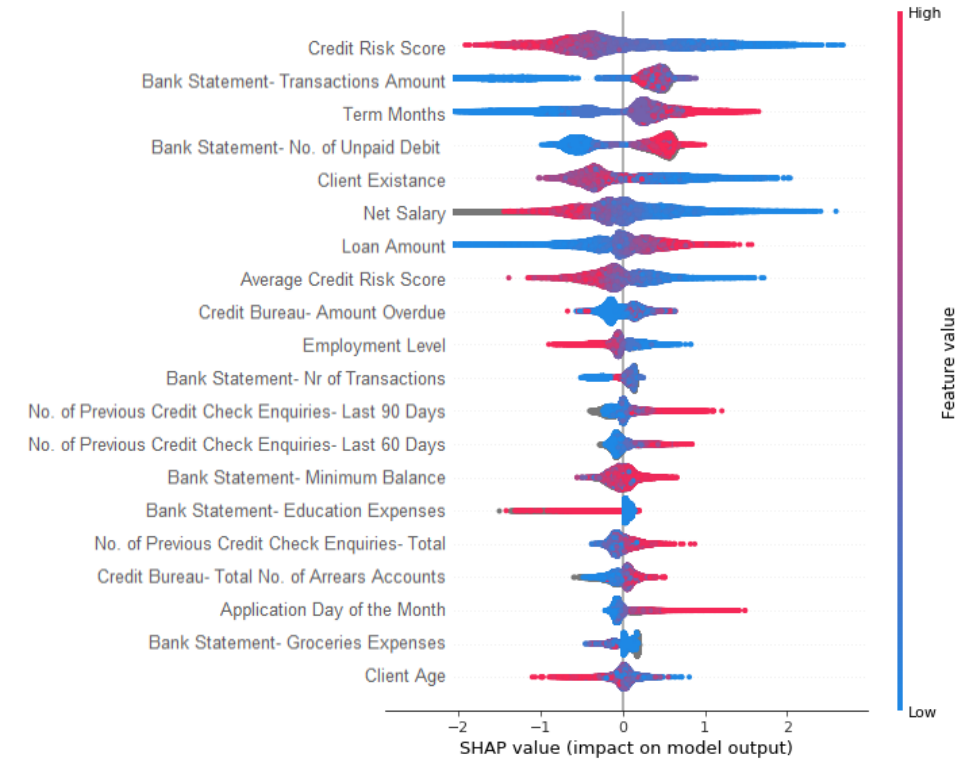
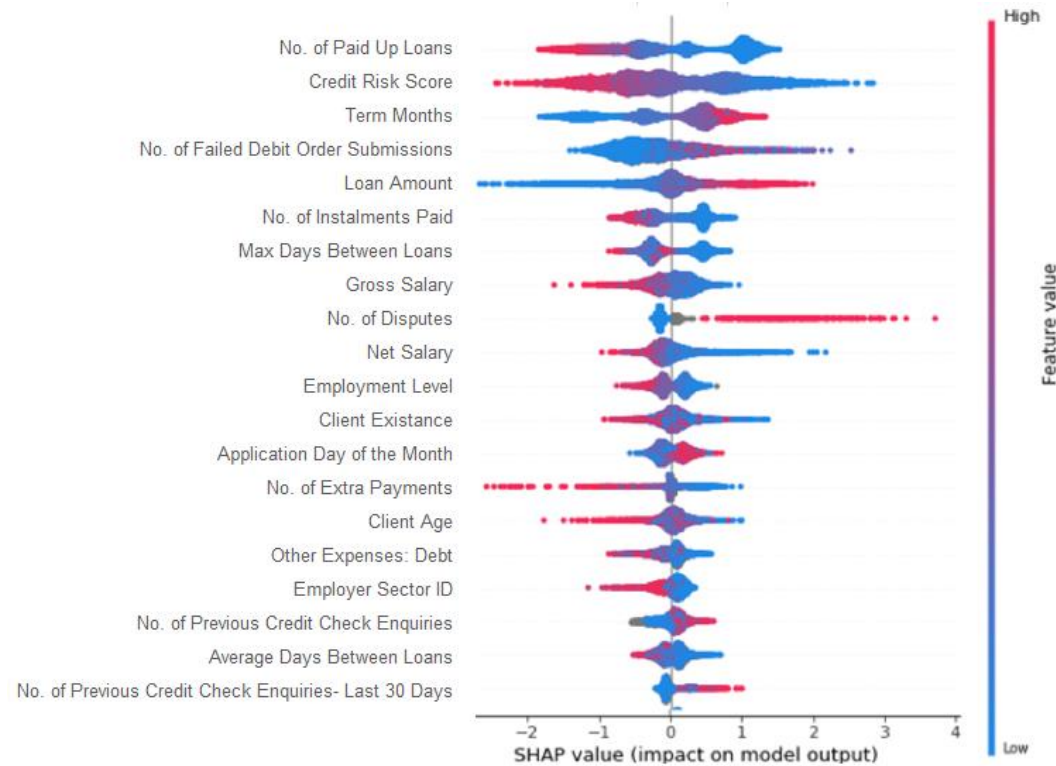
Affordability and risk forecaster

Score Lab: And how it's allowed us to reposition ourselves against the industry



Affordability and risk forecaster

Score Lab: The models continue to evolve on a quarterly basis





Transforming fraud detection

Fraud Lab

Fraud prevention



To combat fraud, Fractal Labs has developed an AI fraud detection system that characterizes client actions and detects anomalous behavior.



Detect fraudulent actions between FinCloud and all its interfacing systems.



In-house developed software system monitors e-wallet activity, associations between customers and other alternative data.

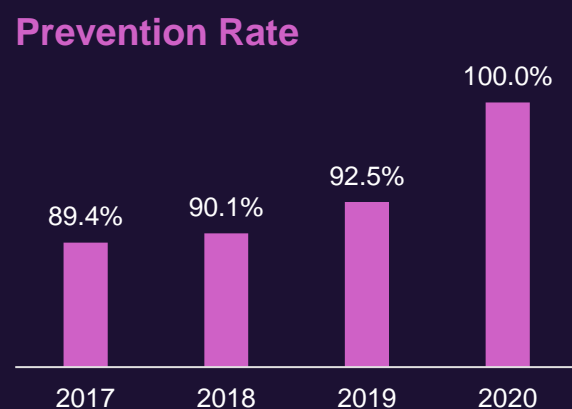


Identify organized groups of fraudsters, synthetic identities, stolen identities, compromised networks and hijacked devices.



Identify rogue agents within the Fractal network, employees modifying data for their own gain, criminals trying to game financial processes, and individuals using stolen identities.

Prevention Rate



Losses as % of sales

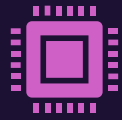


- Local credit bureau information
- Our closed-loop fraud bureau (all participating organisations in a jurisdiction)
- Supplemented by online data (IP address, IMEI, phone type)
- And enhanced by digital behaviour (speed of capture; number of typing errors, is data input captured or copied)



Loan origination experience

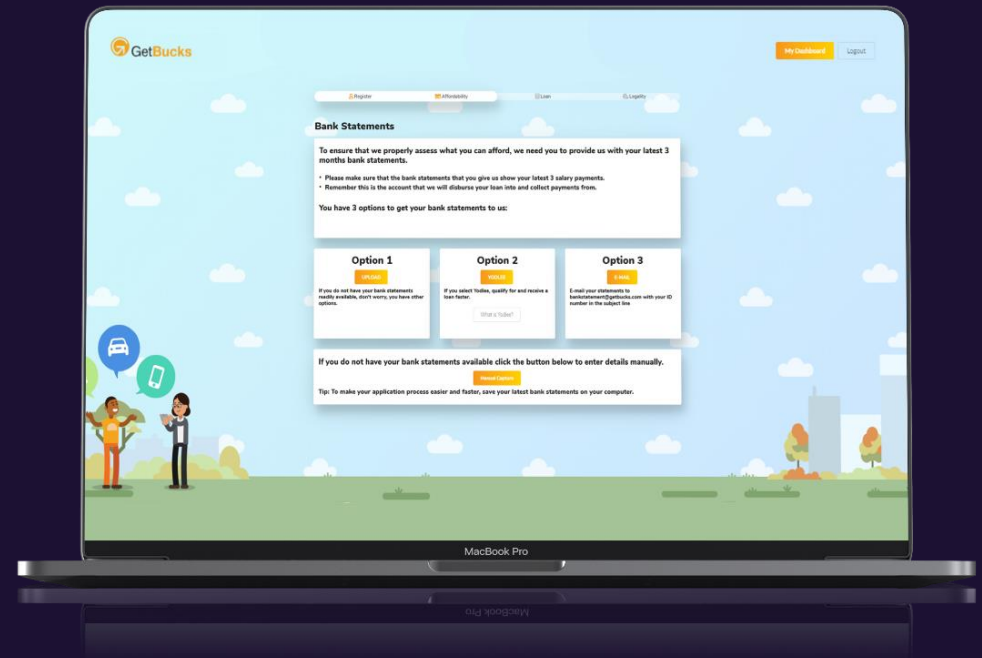
Technology driven customer experience



Using a stack of cloud-based and web technologies, loan applications are simplified and take substantially less time to complete.

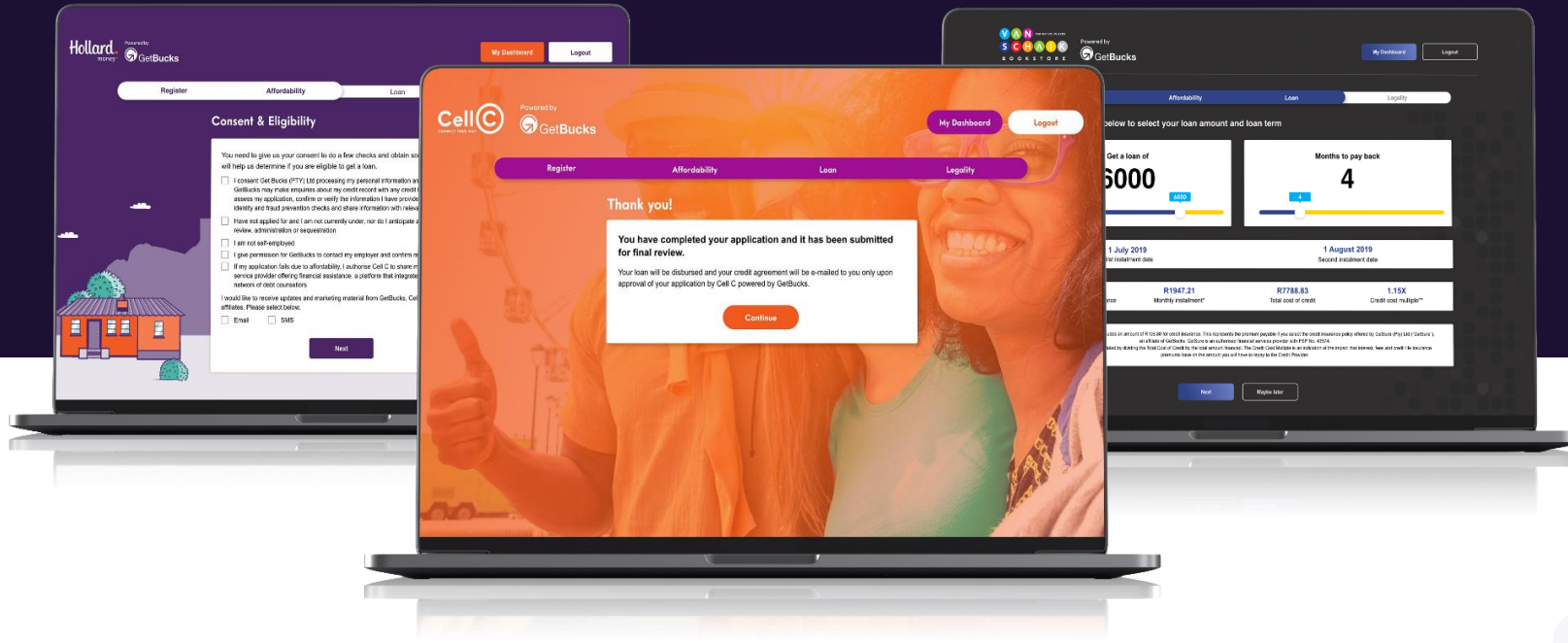
Benefits also include:

- Reduced risk for client as well as lender
- Improved level of compliance
- Elimination of human error probability
- Quicker turnaround time and ultimately Resulting in improved customer experience
- Platform agnostic. Can be deployed with the data science modules or on a standalone basis



Lender Lab

Ultimate loan process



The platform has been developed in a way that can be easily adapted to different business requirements.

Design, flow and functionality can be tailored to market and customer experience



Risk

Risk – IFRS 9 Provisions

1. Centralised Group Function
2. Background IAS39 vs IFRS 9
3. Macro-economic forward-looking
4. Model Governance / Audit
5. Reporting





Our team

The team



Gunther Marais | Managing Director

Gunther has 9 years' experience in banking risk management with a focus on stochastic modelling, counterparty risk and derivative valuations. He joined MyBucks in 2015 as a credit risk analyst and in 2019 took up the role of group CRO overseeing all risk reporting as well as the IFRS 9 modelling for the group. Gunther holds an MSc in Applied Mathematics



Leilanie Uys | CDO

Holds a Master's Degree in Computer and Electronic Engineering which was focused on the automatic classification of digital signals. Completed her master's degree at the CSIR's. She has been working in the FinTech industry since, specialising in credit risk modelling and data engineering.



Kobus van der Merwe | CTO

Holds an Honours degree in Computer Science, specialising in Software Engineering. Experienced Software Engineer in the Data Science. has broad, in depth experience on all aspects of software development, system architecture and robust design principles.



Dirk Postma | CRA

Trained chemical engineer with a MSc with 18 months experience as a credit risk analyst. He brings the engineering- and problem-solving mindset to the department. Dirk is in-part responsible for the group impairment (expected loss) modelling under IFRS9, as well as the credit risk reporting.

The Board



Timothy Nuy | Founder

Timothy Nuy founded Finclusion in July 2018 with a vision of enabling financial inclusion through data driven lending. In March 2019, Timothy Nuy was asked to return as MyBucks S.A. (a German listed, Luxembourg based African bank holding company) Chief Executive Officer to lead the Company's financial restructuring. Under his leadership - the Company executed a c. EUR64m Debt Recapitalization, a complete overhaul of governance frameworks across the Group and a retrenchment of over 100 staff members and disposal of non core assets leading to the Company's return to positive equity.

Timothy has over 10 years of international experience across Europe and Sub-Saharan Africa in management, investment and advisory capacity. During his previous tenure with MyBucks from 2014 until 2018, Timothy was most notably involved with the group's acquisitions of banks in Malawi, Mozambique and Uganda as well as its listing on the Frankfurt Stock Exchange.

Prior to MyBucks, Timothy was an Investment Director with ADC African Development Corporation AG and an Assistant Manager in KPMG's Transaction & Restructuring team in Hamburg. Timothy holds a BSc from Maastricht University and is a CFA Charterholder.



Mark Young | Director

Mark is the CEO of the GetBucks South Africa Group and a founding director of Fractal Labs, with over 25 years experience in the African financial services landscape. Prior to joining MyBucks, he was the founder and CEO of Ideation, a specialist lending and insurance consulting company with clients in South Africa, Nigeria, Kenya and Malawi with a focus on credit risk, capital raising, and value chain transformation. Mark was previously the Deputy CEO and CRO for Bayport SA and the CRO of Old Mutual Finance. He has served as the chair of these organisations credit committees as well as serving as a non-executive director of Mazwe Financial Services, Old Mutual Investment Administrators and a trustee and chair of the Board of Trustees of the Fairbairn Capital and BoE retirement funds.

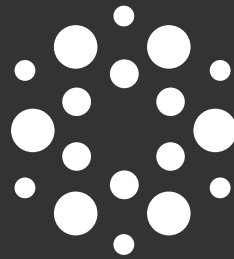


Tamuka Mpofu | Director

Tamuka Mpofu has over a decade of experience in the finance sector. He completed articles training with KPMG Chartered Accountants Zimbabwe with a specialty in Banking & Financial Services. He has successfully led audits of the largest listed and non-listed banking institutions in the country in addition to insurers and other financial service providers. He previously was an Audit Manager with MooreStephens International before joining GetBucks Microfinance Bank Limited as its Head of Internal Audit. Tamuka has taken on the role of Group Finance Manager for MBC Holdings Limited, a bank holding company, where he focused on financial reporting and management. Tamuka is a strong believer in innovation through technology having spearheaded implementation of several e-platforms to improve efficiency.

Tamuka Mpofu holds a Bachelors of Accounting Sciences (BCompt) from the University of South Africa (UNISA). He also holds a post-graduate CTA (Certified Theory in Accounting) Level 1 from UNISA with emphasis on Financial Accounting, Management Accounting, Audit and Taxation. He is a Certified Expert in Microfinance with the Frankfurt School of Finance & Management.

Tamuka Mpofu is an avid First Aider and is passionate about emergency response. He is also a qualified and accredited trainer facilitating several professional training courses including those for the Institute of Internal Auditors (IIA).



Thank you

Fractal Labs

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