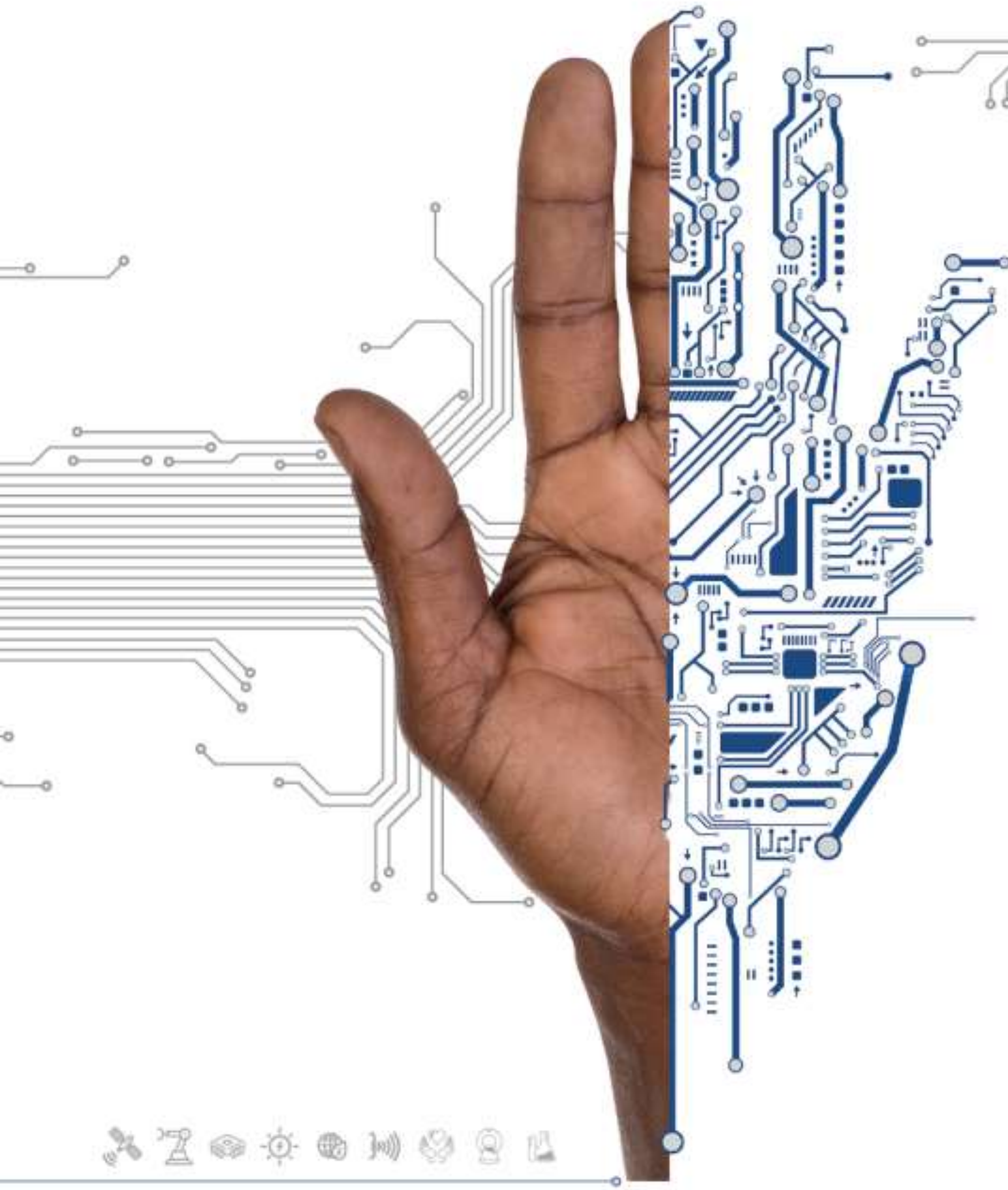

technology innovation AGENCY
Innovating Tomorrow Together

QUALITY DRIVE

Presented by: Nomfundo Cele

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

INTRODUCTION

- Road accidents kill over 1.35 million people each year and are one of the six highest causes of disability (WHO).
- Road traffic accidents rank as the sixth leading cause of death and account for 2.2 per cent of all deaths globally.
- These deaths disproportionately happen in sub-Saharan Africa (WHO).
- Road safety and road accidents has become a serious public health issue in sub-Saharan Africa.
- In the context of South Africa, the World Health Organization found that South African cities are more prone to traffic accidents with approximately a million road-traffic accidents each year.
- BRICS already account for approximately 20% of the world's deaths from road traffic injuries and the associated economic losses estimated at 1 to 3% of gross domestic products .

PROBLEM

- The severity of injuries sustained resulting from road traffic crashes has a significant impact on the South African public health system and economy.
- The current death toll on South African roads is not only traumatic for families but places a huge burden on the health system and is detrimental to the economy in lives lost and medical expenses and loss of income.
- South Africa has not yet made significant improvements in reducing the death toll nor on the number of crashes annually.
- Important risk factors for road traffic injuries include failure to use seatbelts and child restraints in cars, speeding, failure to wear a helmet while travelling on a motorcycle, and driving while under the influence of alcohol.
- A person living in one of the BRICS countries is at a relatively high risk of having a fatal road traffic injury because of one or more – often avoidable – risk factors.
- There is a paucity of nationally representative and systematically collected data on the risk factors for road traffic injuries in BRICS. This gap in knowledge needs to be filled quickly.

BRICS ROAD TRAFFIC ACCIDENTS

Road traffic accidents excluding South Africa:

- In numbers, Brazil is in the fifth position in traffic injuries.
- After India, China, the United States and Russia.

Brazil

- Road accidents in Russia reached the scale of a national disaster.
- Accompanied by a rapid increase in the motorization.
- An accident risk rate that is 3–4 times higher in Russia than in other countries with a high level of motorization.

Russia

- India is an LMIC with more than 1 million annual trauma deaths.
- Trauma has become the country's third leading cause of death .
- Trauma injuries include road traffic injuries.

India

- Currently, many BRICS countries such as China urgently need to find better strategies to improve their road safety.
- China's road safety still confronts considerable challenges with substantial road accidents and casualties, together with a high mortality rate.

China

SOLUTION

- Machine learning technology to collect data on driver behaviour on the road (speed, braking, acceleration, over taking etc.)
- Cloud technology to create a database on driving style.
- Provides data on monthly average fuel consumption and performance average.
- Driver performance average indicates on how well the driver has been performing in the past month.
- Performance average determines the safety average, likelihood of commuter safety.
- On the database, the readings that are too high (for example) become red (danger), green (acceptable), orange (above set limit) approaching danger (orange is a warning).
- Vehicle owners are able to trace and retrieve data in cases of accidents.
- Data is processed and stored in a cloud technology to create a database on drivers.
- Data will be commercialized.
- Drivers can retrieve driver profile.
- Sensors (long term)- will shift from mobile application (it is vulnerable) to sensors inserted on the vehicle dashboard.

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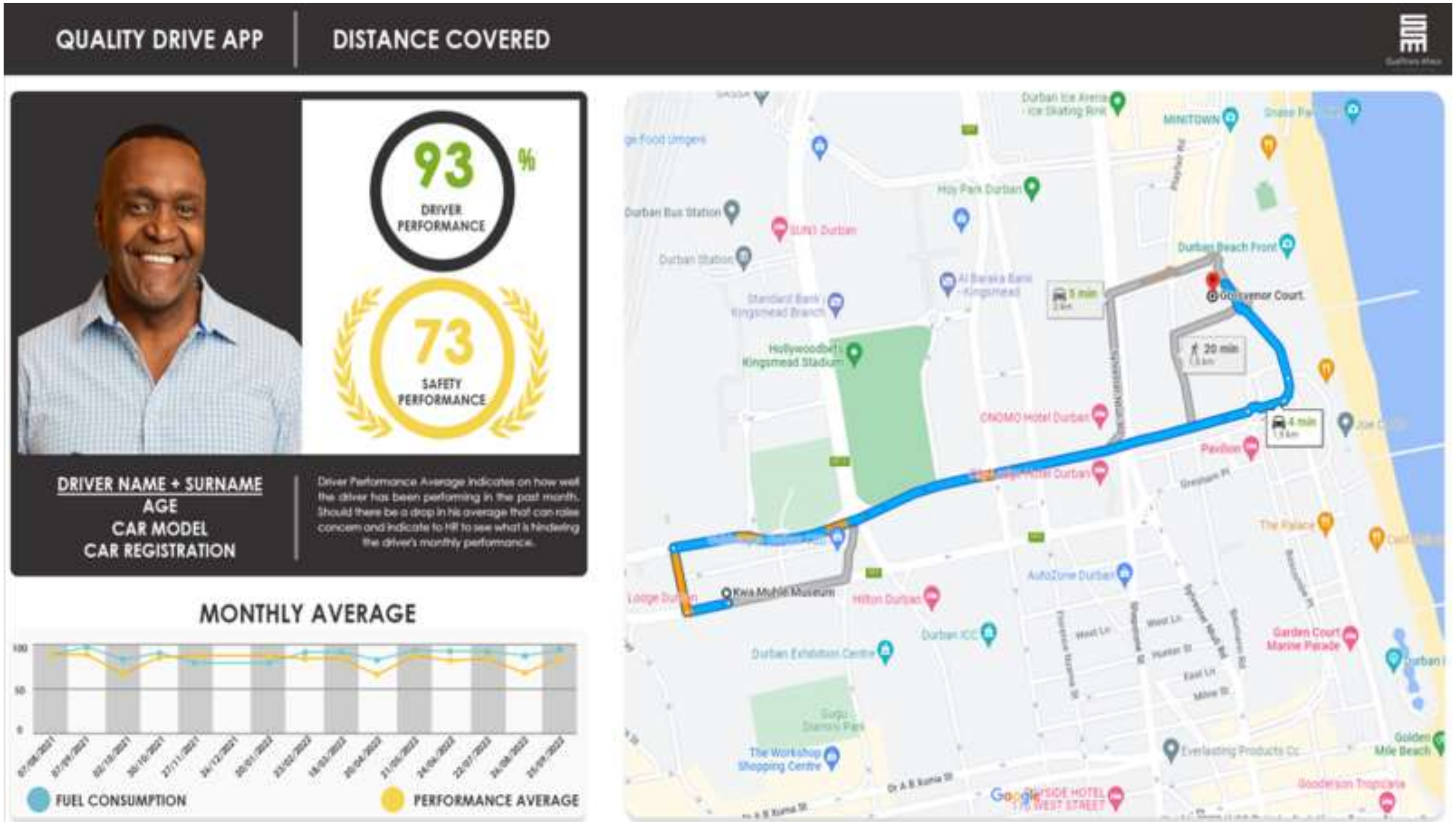
PROTOTYPE BOARD



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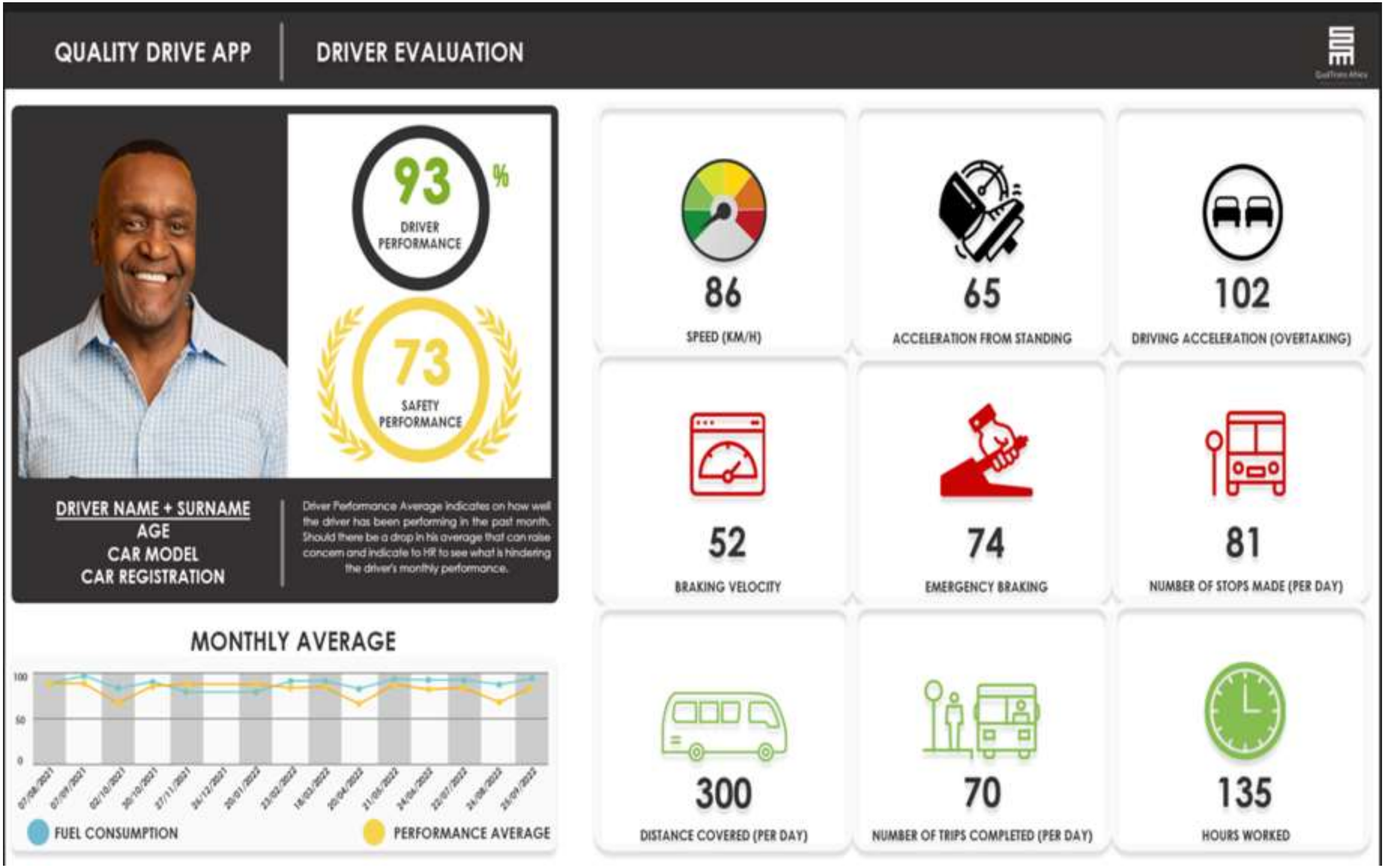
QUALITY DRIVE APP
DRIVER EVALUATION
93 %
DRIVER PERFORMANCE
73
SAFETY PERFORMANCE
DRIVER NAME + SURNAME
AGE
CAR MODEL
CAR REGISTRATION
Driver Performance Average indicates on how well the driver has been performing in the past month. Should there be a drop in his average that can raise concern and indicate to HR to see what is hindering the driver's monthly performance.
86
SPEED (KM/H)
65
ACCELERATION FROM STANDING
102
DRIVING ACCELERATION (OVERTAKING)
52
BRAKING VELOCITY
74
EMERGENCY BRAKING
81
NUMBER OF STOPS MADE (PER DAY)
300
DISTANCE COVERED (PER DAY)
70
NUMBER OF TRIPS COMPLETED (PER DAY)
135
HOURS WORKED
MONTHLY AVERAGE
100
50
0
FUEL CONSUMPTION
PERFORMANCE AVERAGE

Driver Code	Name	Surname	Car Model	Registration	Driving Hours P/Day	Trips P/Day	Distance (km)	Acceleration Index	Braking Index
QDA#01022	Lunga	Khumalo	Toyota Siyaya	DG 41 OY GP	8	16	368	36	29
QDA#01023	Bobo	Shile	Toyota Quantum	QA 21 HV GP	8	16	368	38	26
QDA#01024	Brandon	Black	Toyota Siyaya	DG 44 JY GP	8	8	184	12	3,1
QDA#01025	Charles	Mangi	Hyundai H1	BD 41 OY GP	8	16	368	35	28
QDA#01026	Jacob	Sikhisana	Hyundai H1	LK 36 NM GP	5	9	207	23	29
QDA#01027	Lethabo	Hamphe	Hyundai H1	RT 11 FR GP	8	14	322	26	19
QDA#01028	Lintswe	Shele	Hyundai H1	LK 36 LY GP	9	18	414	38	25
QDA#01029	Lucky	Nelson	Toyota Siyaya	OP 22 VC GP	5	11	253	26	17
QDA#01030	Lwandile	Dlamini	Toyota Quantum	JC 49 YP GP	8	19	437	74	86
QDA#01031	Mandla	Tata	Hyundai H1	JF 56 YP GP	8	16	368	35	26
QDA#01032	Mojalefa	Moswana	Hyundai H1	HJ 70 HC GP	9	15	345	29	26
QDA#01033	Mthemkhulu	Shezi	Toyota Siyaya	WS 73 FD GP	8	17	391	56	65
QDA#01034	Nkosinathi	Bkosi	Toyota Siyaya	QZ 00 RE GP	11	22	506	86	77
QDA#01035	Ntokhozo	Vala	Toyota Quantum	BV 87 BR GP	3	6	138	19	16
QDA#01036	Pheko	Sibilayelo	Toyota Quantum	IF 55 XC GP	7	16	368	51	56
QDA#01037	Phila	Mahke	Toyota Quantum	JV 09 TH GP	10	5	554	26	23
QDA#01038	Sabelo	Padi	Hyundai H1	AA 02 HR GP	9	19	437	49	55
QDA#01039	Sibusiso	Thebe	Hyundai H1	HG 63 UH GP	10	10	600	24	24
QDA#01040	Sipho	Nkosi	Toyota Siyaya	JV 09 TY GP	8	16	368	38	26
QDA#01041	Sizwe	Lentle	Toyota Siyaya	JV 98 TT GP	11	7	450	17	7
QDA#01042	Taphelo	Lehuko	Toyota Siyaya	BV 87 RR GP	9	18	414	-4	20
QDA#01043	Thabang	Peterson	Toyota Quantum	HI 13 GS GP	8	17	391	41	57
QDA#01044	Theo	Bheko	Toyota Quantum	CV 17 DD GP	6	12	276	28	24
QDA#01045	Tumelo	Nyakhalo	Toyota Siyaya	FK 45 WQ GP	7	14	322	30	32
QDA#01046	Vusi	Vilakhazi	Hyundai H1	HJ 78 HC GP	8	10	230	16	4,3

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BUSINESS MODEL

- Trucking companies (increase in minibuses and truck fatal collisions- minibuses and trucks are more likely to crash)
- Minibus taxi providers
- Ride hailing service providers
- Bus providers
- Private vehicle owners
- There are three revenue models 1) the owner will pay a monthly or yearly subscription for each vehicle 2) the driver will pay to have access to their driver profile 3) when there is enough collected data it will be commercialized to universities, research institutions, vehicle manufacturing companies, insurance companies, public and private sector etc.
- Our customers are expected to pay R150 a month per vehicle or 1800 once off yearly premium. Driver profiles will not cost more than R100 a month to manage.
- More extensive research and consultation will determine the fee on data commercialization.

VALUE PROPOSITION

- Quality Drive provides data on monthly average fuel consumption and performance average based on speed, acceleration, braking etc.
- The driver performance average indicates on how well the driver has been performing in the past month.
- Performance average determines the safety average, likelihood of commuter safety.
- A database on different driving style attributes such as acceleration, braking, overtaking etc.
- Driver profile accessible to the vehicle owner and driver (to understand driver performance or attend to a query/incident. As well, the driver can use the driver profile to prove his competency when searching for new employment).
- On the database readings that are too high (for example) become red (danger), green (acceptable), orange (above set limit) approaching danger (orange is a warning).
- Real-time notifications of readings to driver and vehicle owner.
- The technology retrieves in-depth details on driving style to predict driver performance/attitude/behaviour on the road.
- Data will be commercialized to research institutions, universities, vehicle manufacturing companies etc. and can use the data to study the performance of vehicles under different scenarios.
- Data can be used to study and compare performance across different vehicle brands also help identify the problem with driver behaviour and Toyota Quantum.

TRACTION

- Founded in February 2021 (after awarded NRF Doctoral Scholarship in Innovation).
- UJ business incubation.
- UJ advanced business incubation (UZIMA).
- Academy for Women Entrepreneurs (USA-White House initiative).
- USA Dream Builder.
- Leadership in business training at the University of Texas at Austin, at the Mcombs School of Business.
- Pitched at Capital Factory in Austin, Texas.
- Training in machine learning at the Universite Grenoble Alpes, France.
- Entrepreneurship, Leadership and Innovation bootcamp in Batumi, Georgia (UJ TTO).
- Technology Innovation Agency (Department of Science and Innovation).
- Development of a minimum viable product (functional prototype).

TRACTION

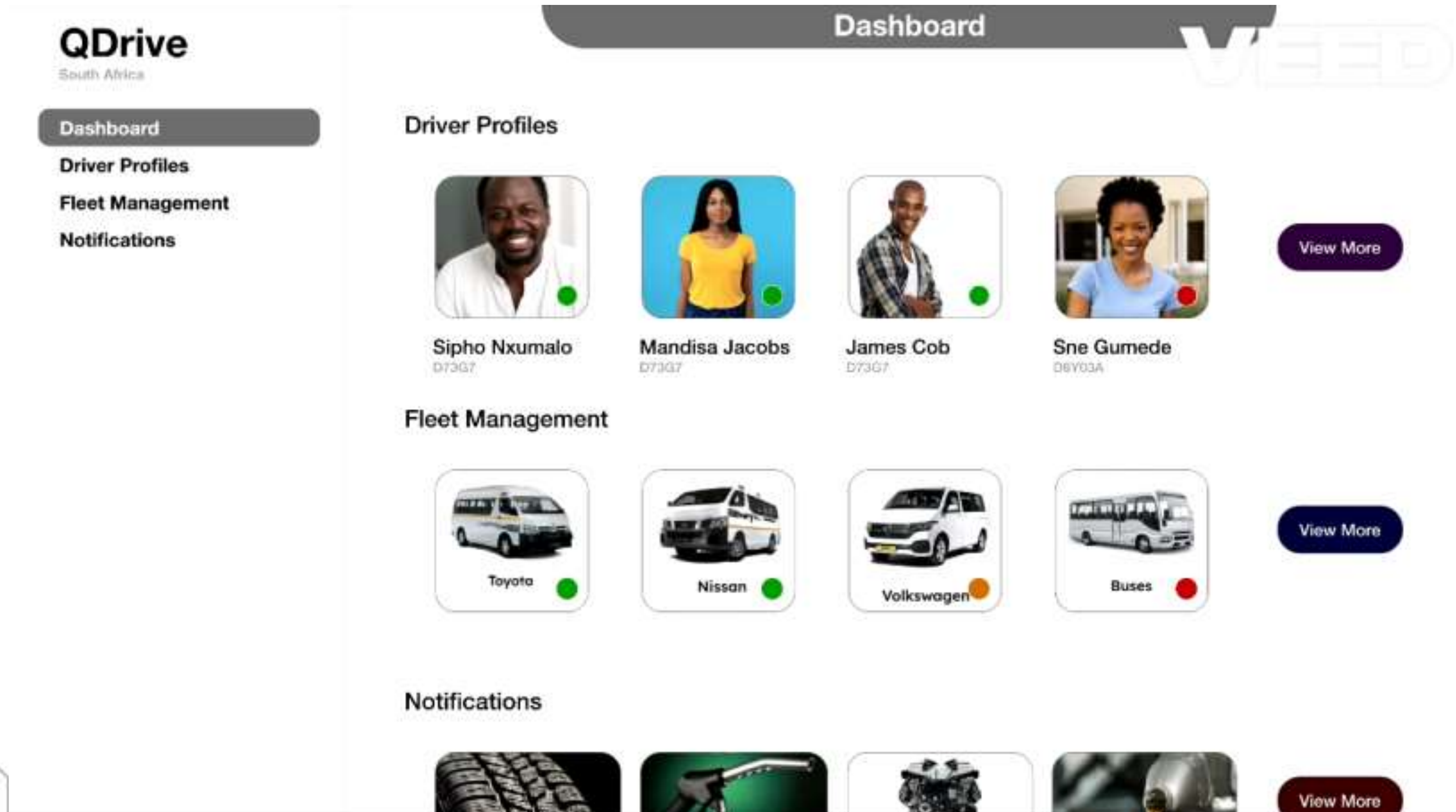
Contracted suppliers to develop the **QDrive** Platform:

Montso Solutions - Front End Developer

KiDigital Solutions - Back End Developer

QDrive platform

MINIMUM VIABLE PRODUCT



GROWTH STRATEGY

- Secure additional funding to move the QDrive platform from:

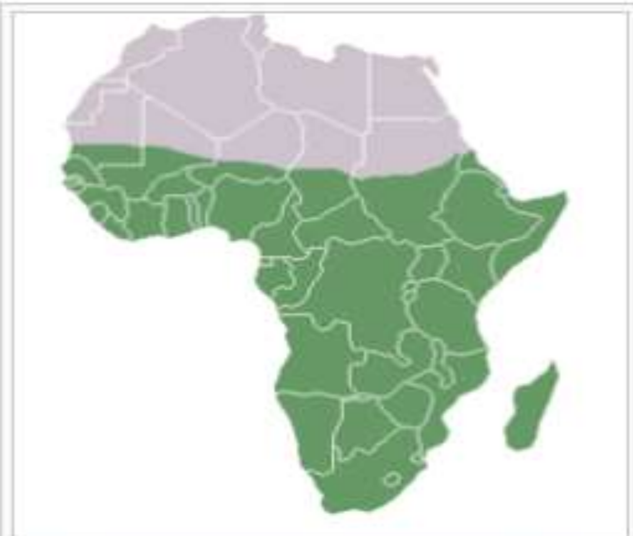
1. Web-based (prototype to show functionality) to a downloadable application.

2. Downloadable application to sensors (a long term projection- to be installed on vehicle dashboards).

BRICS GROWTH STRATEGY

- Road traffic crashes contribute substantially to the economic burden of countries and for the BRICS countries that are currently experiencing accelerated economic growth – leading to higher volumes of traffic –institutional capacity is still needed to cope with such growth or to invest adequately in the systems needed to maintain or increase road safety.

SADC GROWTH STRATEGY



A political map showing national divisions in relation to the ecological break (Sub-Saharan Africa in green).

Source: New World Encyclopedia
https://www.newworldencyclopedia.org/entry/Sub-Saharan_Africa

Map of the Southern African Development Community (SADC) region [5].

Konstantinus et al.,2019
https://www.researchgate.net/figure/Map-of-the-Southern-African-Development-Community-SADC-region-5_fig1_331715314

Community

Regional Partnership

Regional cooperation

THANK YOU

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