TECHNOVERA

Technovera Pty Ltd
Registration: 2015/309096/07
Vat: 4480274374

Project Proposal For:

Chaps

Date: 2019 August 27

Pretoria Office Address
The Innovation Factory,
6 Mark Shuttleworth Street,
The Innovation Hub,
Lynnwood, Pretoria,
0087

Johannesburg Office Address
Maxum Digital, 2nd Floor,
The Digital Innovation Zone,
Cnr of Eendracht Street and Smit Street, Braamfontein, Johannesburg,
2001

Company Contact Details:
Contact Person: Neo Hutiri
Contact number: +27 (0)82 861 7009
E-mail: neo.hutiri@technovera.co.za

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1. Introduction

This document outlines the core aspects of proposal drafted by Technovera a project implementation with regards to Pelebox Smart Locker for chronic medication collection at healthcare facilities in Eswatini.

The document aims to provide the reader with a high-level view of the challenge to be addressed, the innovative solution, how it works and how it can be leverage for better access to chronic medication. It's a result of two meetings, held to discuss a project implementation to help chronic patients manage their health status and collect treatment in a dignified manner.

The second part of the document is aimed positioned to ensure that Chaps has all the information needed to consider onboarding project to help improve access to medicine. It's meant to consolidate some of the key points discussed in the meeting in the form of a proposal for the adoption of the Pelebox Smart Locker Solution for chronic medication into the identified areas.

2. About Technovera – Technology Partner

Technovera is a social impact startup that is focused on technology inclusion with the aim of improving the last mile for chronic medication access in Africa. The company was founded by Neo Hutiri on the 28th of Aug 2015 as an initiative to channel innovative technologies in the South African Healthcare Sector. Technovera has a presence in Gauteng and KZN based on the 19 Pelebox sites where the Pelebox Smart Locker Technology is being implemented.

The name "Technovera" is derived from a combination of the Technology focused theme of the organisation. "Vera" is Latin for truth. The idea of building technology that is authentic in serving people who are sometimes overlooked was the ethos for the name. We identify as a social enterprise leveraging technology to develop inclusive solutions in healthcare. We are positioning the Technovera brand as an innovative technology organisation that is focused on developing simple technology with the aim of improving the last and first-mile access in Africa. Technovera is a 100% black owned private company operating in South Africa.

3. The Problem

South Africa has world's biggest antiretroviral therapy (ART) programme for patients living with HIV and AIDS, and there's been a steady increase in the number of patients with non-communicable diseases (NCDs), requiring chronic therapy. A patient's experience tends to be one of long waiting times, typically above 3 hours. This poses potential adherence barriers which may lead to poor health outcomes and places a strain on the patients in terms of transport costs and loss of income.

On the 4th of January 2014, I (Neo Hutiri, Founder of Technovera) was diagnosed with tuberculosis. I started my 6 months' treatment by collecting medication at my local public clinic in Bophelong Township in Vanderbijlpark. My biggest challenge was that I was losing between 3 to 5 hours every second Friday when collecting medication due to long queues, this excludes the travel time to and from the clinic. Technovera was born after this frustrating experience.

Most working people on chronic treatment in SA which is state issued have to ask for permission to take time off from work and travel to their clinic. Average waiting times for patients is estimated at 4.5 hours. An estimate of 2.5-million work-hours are lost per month by chronic patients waiting all day to collect their routine medicines. Long queuing times are the norm in public sector facilities.

There are two illnesses that plague a large number of South Africans, namely HIV/AIDS and Tuberculosis (TB). South Africa has the biggest Anti-Retroviral (ARV) treatment program in the world and the Department of Health plans to serve 4.6 million people by 2016 through the program. TB remains one of the world's deadliest communicable diseases. Chronic medication distribution for TB and ARV is a significant activity at most public clinics and hospitals in South Africa which results in frustrating long queues.

Thus, Technovera set out to develop a solution that could address this problem and transform access to medicine. The business was established with the aim to reduce the average collection time for patients from an average of 3 hours and 30 min to under 2 minutes.

4. The Solution (Product Offering)

The Pelebox Smart Locker enables a pharmacist or an authorised person to pack medicine in advance for chronic patients that will be collecting medication on a particular day. The system then notifies chronic patients of the readiness status of their medicine for collection and issue them with a One-Time-Pin (OTP) via SMS. This OTP together with the patient's cell phone and ID number can be used to open a specific cubicle which has their medication inside.

A patient can collect medicine in a safe, convenient manner without spending too much time in long queues by using smart locker units. Patients can collect medicine in their preferred location with extended operating hours beyond the normal pharmacy or clinic times.

The locker is temperature controlled to meet standards prescribed by the South African Pharmacy Council. The solution monitors collections throughout the day and would reconcile this information at the end. It also has capability to check number of non-collections and remind a patient of a collection window. More-over the Pelebox Smart Lockers can be placed inside a clinic as a speed services for collection or at a community centre (e.g. Library) which is closer to the patient.

The base unit can facilitate 72 transactions per day before reloading. That's just under over 1200 transactions per month using one locker unit. This is based on 24 days per month, with 70% utilisation calculation. A larger unit with 99 doors, translates to 1600 patients per month. It's also modular which means that we can increase capacity in stages of 27 all the way up to 234 patients per day depending on demand.

pelebox

think inside.

The innovation is in line with the new National Health Insurance framework and the National Department of Health's Central Chronic Medication Distribution and Dispensing (CCMDD) programs. The technology serves as a pick-up-point in the patient's community and ensures that the patient is no longer subjected to long queues when they need to collect medicine.

Its also important to note that the solution only applies to chronically stable patients. Over 72% of medicines issued in primary health care facilities are chronics.

Pelebox smart lockers have a deep rural and township economy application. We've taken the concept of smart locker, a technology that is really making headway in the online retail market, turned it on its head and found a niche application in the public healthcare sector. We could only achieve this by challenging ourselves to search for a technological mindshift that enabled us to really push boundaries in looking for a high impact solution.

Pelebox has undergone a transformation since we started, we originally thought that it would take at least 2 to 5 minutes for a patient to collect their chronic medication. We never expected an average collection time of 36 seconds.

When patients think of our solution, they think of Think of it as an ATM for Medicine, the fact that they can just walk over to collect their medicine from a Pelebox Smart Locker, which takes less than a minute. They just need a pin and their cellphone number.

We have registered a South African Patent in protecting the technology and the solution behind back-end processes. We also encourage technology partnership for people that want to do what we do along site us. It's a big market and collaboration will help us serve our patients better in the long run to achieve our social impact targets.

As Technovera, we recognise the steady increase in the number of patients with non-communicable diseases (NCDs), which results in more people requiring chronic therapy as a key indicator for the need for solutions that will address better access to chronic medication. Especially in sub-Saharan Africa and Low to Middle income countries.

5. Pelebox – The Value Proposition

The product evolved in consultation with various stakeholder such as The Innovation Hub, South African Pharmacy Council, The National Department of Health, The City of Tshwane and The Aurum Institute (A leading healthcare organisation that has been successfully battling the joint scourge of the HIV and TB for over 20 insightful years) to what we today can refer to as “Pelebox Smart Lockers”.

This included patient feedback and feedback from partners. Our objective was to launch a product that is patient-centric and caters to the needs of the patient while still respecting and all other systems that are required to ensure patient safety.

The value proposition to the patient is:

1. No more queues: collect repeat medication without waiting on a queue
2. Fast collection: Ensure that patients are able to access their medication under 2 min
3. Efficient process: Seamless experience that is reliable and can be trusted all the time
4. Privacy and no stigma: Collect medication without fear of people seeing you and knowing what condition you have.
5. Simple collection: Design a system and process that is simple to cater for a wide range of patients groups, ensure that technology is not a barrier for usage
6. Always available: Be assured that the system will always be able to help the patient.

The value proposition to partners or operating facilities:

1. Reliability: Be assured that the locker will always be able to assist patients
2. Reduce workload: Introducing smart lockers ensures that the staff can focus on other key critical tasks while the smart locker serves patients throughout the day
3. Technology adoption: Improve systems by adopting of patient centric technology that can save costs for under-resourced facilities that cannot afford to hire more staff members
4. Reporting: The locker can keep accurate records of collections and ensure that all daily and monthly reconciliations happen seamlessly

6. Local Manufacturing

Technovera designs, manufactures installs and maintains Pelebox Smart Lockers at the client's facilities and other partner locations based on need. Based on our internal capacity and skills, we set out to build a solution that leveraged all the resources that we had access to.

We have been challenged by "business experts" to consider sourcing the lockers units from China, an option that we did consider extensively at the beginning part of our journey. We have however proven that we can design, manufacture the units locally with the highest quality that we can control.

We've secured a partnership with a local steel fabricating that assists with the steel work for the solution manufacturing. A business case to justify setting up our own manufacturing site is a going concern and for now, we've selected to partner for the fabrication stage of our manufacturing phase. The partner produces the steel shell that we use as a base for building a smart locker. Technovera owns the steel designs of the locker solution and is responsible for all the electronic integration that gives the smart locker its intelligence. Technovera is also responsible for the integration of the cooling solution onto the locker unit.

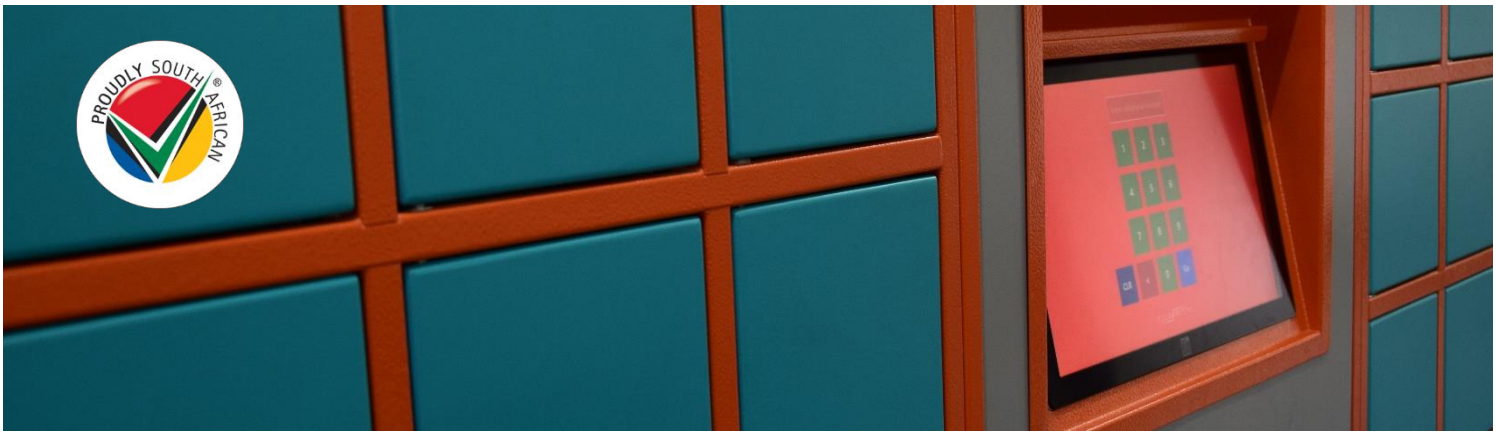
We are a Proudly South African member and share a commitment to uplifting ethos that promotes social and economic change and progress. We make a meaningful contribution to building South Africa's economy, alleviating unemployment, and retaining existing employment opportunities.

Pelebox smart lockers are a South African technology that Is designed and manufactured locally.

Product users are generally chronically stable patients collecting chronic medication at healthcare facilities or an alternative pick-up-points.

Technovera seek to catalyse the development of innovative approaches and technologies that will enable South Africa to mitigate the spread and impact of HIV and ultimately reach HIV epidemic control. The Pelebox Smart Locker solution concepts is a leapfrog from current approaches in an effort to fill critical gaps in the response and is making rapid progress towards epidemic control. Through this project submission Technovera seeks to scale-up the adoption of this innovative solutions that will improve our ability to reach HIV epidemic control in South Africa.

7. How Pelebox Smart Lockers Works



How does it work?

For the patients collecting medicine and for the person loading it

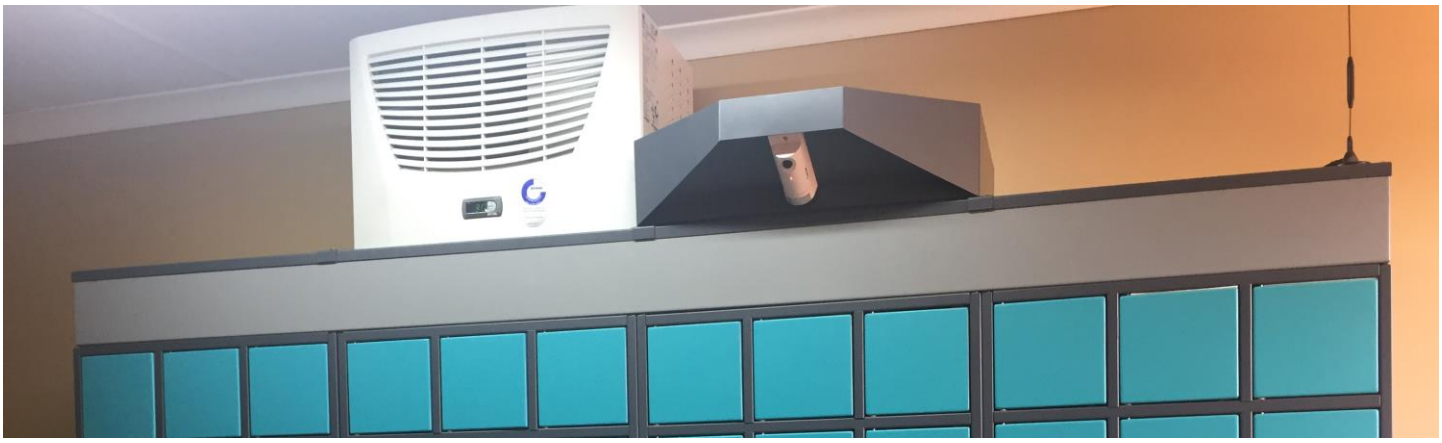
Loading Process – Medicine into the Pelebox Smart Locker

1. Based on the list of Patients registered to use the system, individual cubicles are automatically pre-allocated in advance using the patient's collection date, personal details and corresponding barcode.
2. A day before the collection date, an authorized loader logs-in at the locker using a username and password
3. Once logged in, the authorized loader can scan the barcode on each item, the system then brings up the Patients details for confirmation.
4. After the confirmation, the corresponding cubicle opens for the loader to place the item inside
5. The loader can then scan the next parcel, repeating the process until all items for the day are loaded

Loading Process – Medicine into the Pelebox Smart Locker

1. A day before the collection date, a patient receives an SMS indicating that their medicine is ready for collection, this also contains the patient's One-Time-Pin (OTP) for secure collection
2. On the collection day, the patient visits their smart locker, enters their cellphone number together with their secure OTP.
3. Their smart locker brings up the patient details for confirmation
4. After confirmation, the corresponding cubicle opens for the patient to collect their medication
5. The patient closes the cubicle and can be on their way
6. The collection is reconciled into at the master records can be accessed online

8. Product Features



The Pelebox Smart Lockers are internet enabled, this means that the locker can connect to our cloud bases web-platform that drives all the reporting and operations. On the Pelebox web-portal, a user can log in and view information about the locker and the linked medication parcels.

Different users are able to pull operational reports, reconfigure the locker and enable specific cubicles, monitor locker utilization and pick-up schedules. Additional functionality can be added to this platform based on client requirements.

In keeping with the South African good pharmacy practice guidelines, the internal locker temperature is controlled by a cooling unit and is maintained below 25°C. The system automatically ensures that an upper range of 24°C and a lower range of 19°C is maintained.

This is done my means of three independent temperature sensors located in different sections of locker. All the sensors have to be within the prescribed range, in the event that any of the sensors is out of range, the systems send's an alert to a 2nd line support for technical assistance

The Pelebox Technology is designed for scale, the overall concept of smart lockers is based on the need to reach high volumes of patients to increase access to chronic care on a daily basis. The technology can be customized and is more economical than direct deliveries.

Whereas the Courier Pharmacy model still incurs high costs while trying to reach each patient at their homes, Pelebox smart lockers enables convenience while still aggregating collections for better efficiency. The solution is self-contained which makes faster replication possible

The product design phase required careful consideration for capital outlay, as a result the solution follows a Modular Design approach. The ability to increase capacity can be linked directly to increased demand over time, even after the unit has been operating in the field for months.

The center unit is designed for 18 cubicle doors, while the side unit can house 27 cubicle doors. This means that later expansion can be done by appending sides with multiples of 27 cubicle doors. A unit that has 99 cubicle doors consists of 1 center (18) and 3 sides (27×3)

Most of the patients that use lockers often commit time and financial means to travel to the collection point. This means the lockers always have to enable a patient to collect their chronic medication, irrespective of power cuts. The pelebox smart lockers are equipped with battery back up to ensure that they can operate for extended hours without power.

When a power loss occurs, the lockers switch to batter power to provide patients with a means to still collect medication from the unit until power can be restored to charge the unit again. We are also exploring solar for the next generation of Pelebox Smart Lockers in the near future.

9. Pilot with City of Tshwane

Technovera has been working with the City of Tshwane and the National Department of Health in South Africa on a controlled pilot aimed at showing the impact of technology on reducing the average time spent in a clinic and adoption from patients. The original concept was presented to the South African Pharmacy Counsel in early 2016 which then advised Technovera on areas that need to addressed for the solution to have potential of getting to market. In July 2016, the national department of health issued Technovera with an expression of interest for the usage of Pelebox Smart Lockers as part of their efforts on improving access to medicine.

Thus far, we have reached over 3500 patient collections with an average collection duration of 36 seconds (much lower than the anticipated 2 min). The solution has a 100% success rate for the right medicine going to the right patient. This means that the locker cubicle is matched to the right patient, with the right cellphone number through the right barcode a 100% of time.

The pilot site had an average defaulter rate of between 18% and 22%, with the pelebox technology, the default rate using the solution has decreased to 5.6%.

78.7% of our patients have collected their medicine within the 48-hour allocated linked to the due date, the remaining 15,7% collect within 3 days to 12days after the collection date. We continue to experiment with different techniques to get this number lower.

The first session when we show the unit how to use the solution is one of the most crucial point on making sure that the patient is comfortable with using the solution. Over 80% of our patients are able to use the smart lockers without assistance on their first collection, this number jumps to 93% on the seconds session. The technology cannot measure a proxy for adherence through close monitoring collection behaviour. During the pilot, we have not been able to link the solution impact to clinical results of the patients. This is a critical area for the next units that would like deploy with partner.

10. Social Impact to be created

This project aligns with the following strategic macro impact areas:

Local Manufacturing:

As part of this proposal, we recognise that buying locally manufactured goods is one of the initiatives that will help South Africa stimulate employment. This is the main reason why RPRHandzu Trading has decided to partner with an innovative solutions company that ensures that over 93% of the technology that makes up smart lockers is procured locally.

"If we do not buy the food that comes out of South African soil, there will be no farms and no farmworkers. If we do not buy the goods made by South African hands, there will be no factories and no workers," President Cyril Ramaphosa - Jobs Summit in Midrand Johannesburg.

By ensuring that the solution that is proposed here is manufactured locally, our efforts are inline with the national government priority of creating decent jobs in manufacturing phase. Manufacture is also one of the six priority areas, along with infrastructure development, agriculture, mining and beneficiation, the green economy and tourism.

Sustainable Development Goals:

Sustainable Development Goals (SDGs) (or Global Goals for Sustainable Development, the 17 Global Goals, the Global Goals or simply the Goals") are a collection of 17 global goals set by the United Nations General Assembly in 2015. The SDGs are part of Resolution 70/1 of the United Nations General Assembly: "Transforming our World: the 2030 Agenda for Sustainable Development.

The work of this project contributes to Goal 3: Good health and well-being for people by taking actions to Ensure healthy lives and promote well-being for all at all ages. Significant strides have been made in increasing life expectancy and reducing some of the common killers associated with child and maternal mortality. By promoting access to chronic medication for mothers leveraging smart lockers. We contribute to Prevention of mother-to-child transmission (PMTCT) programmes provide antiretroviral treatment (ART) to HIV-positive pregnant women to stop their infants from acquiring the virus.

Goal 3 aims to achieve universal health coverage, including access to essential medicines and vaccines. The solution being proposed in this project aligns CCMDD program where the National Department of Health is centralising dispensing to consolidate cost as outlined by the National Health Insurance Bill.

Health targets for SDG 3 also includes 3.3 which states that By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases. This project aligns with this goal by promoting access to chronic medication so that patients are able to manage their chronic conditions better and result in better clinical outcomes. This contributes directly to promoting access to ART while still ensuring that the innovative smart lockers can be used by patients on a variety of chronic conditions.

Moving from the macro environment to direct impact that will result from this implementation. We are aiming for primary two outcomes

Access to medicine – shorter collection times:

The core of the impact that we aim to generate is for the patient that is currently spending hours on a queue. The core value of this project is to take a patient from 3 hours and 30 min on a queue at a clinic to less than 36 seconds at a Pelebox Smart Locker. That's a time saving of (99,97%) this means that people don't have to ask for leave every time they need to collect their medicine, more importantly, productivity at work can improve because people can collect after hours from a locker.

TB is more common in poor communities where people have low quality housing and limited access to quality health care. TB and HIV are often called a dual epidemic. The South African government is working hard to reach marginalised groups and majority of the 4800 government clinics are positioned in these communities which our solution is designed to have the most impact on.

Worldwide, women constitute more than half of all people living with HIV. The proportion of AIDS diagnosis reported among women has more than tripled since 1958. MediCube empowers all patients to stay on medication and removes barriers to accessing treatment by shortening the collection time.

The burden of disease in our country is a lot more prevalent in our poor communities, In the case of TB we find that incomplete treatment of TB is worse than no treatment at all and is a lot more dominant in blue collar employees and the unemployed. Communities are located far further from a good healthcare facilities. When people fail to complete standard treatment regimens, they develop resistance to anti-TB drugs which cost the state more money to administer multidrug-resistant (MDR) treatment. MediCube aims to reduces these challenges by making medication collection easier for our people to stay on the treatment.

We find that the biggest group of people collecting heart related chronic medicines from our clinics are pensioners, especially medicine for hypertension and blood related conditions. We aim to position our units to make it particularly easy to access their medicines without sitting the whole day to see a sister.

11. Project Costing

Branding

This proposal makes provision for the fact that that Chaps to may choose to co-brand the Pelebox sites along with Technovera. We will ensure that the corporate image of our partner is maintained and aligns with the brand standards communicated during the implementation phase

Proposed Project Scope

- 10 Mid Volume Pelebox Smart Locker Collection Points
- Possible location: Two districts in Eswatini
- All two installed during Phases 1
- Pelebox locker capacity per site: 72 Cubicles per site
- The Pelebox smart lockers will be placed indoors in a partner location. Provision for outdoor sites could be built in the Phase 2 if needed based on the context. The challenge with an outdoor unit is the cooling and the component about theft

System Integration

Should you as a partner need to have an independent M+E process, the technology can be configured to integration to an internal organisational system. This request can be accommodated under this project at no cost.

This assumes a simple web API for integration, 3 weeks would be needed for systems integration to the internal system

If no system exists, Technovera will provide a locker management portal that enables the users to monitor and operate all of the 2 sites. This includes an ability to pull all reports about each locker or the combined operations

Lead time and Operations

It takes 7 to 8 weeks for manufacturing phase after order confirmation and 2 weeks for the installation phase.

The system can be configured to send 2 to 3 SMS's per transaction. This is costed in the admin fee.

Furthermore, this project will include training of a local team member that will be helping with parcels management and loading process.

Installation

Technovera designs, manufactures, installs and maintains smart lockers at various pick up points.

Technovera will be responsible to deliver, install, commission, test smart locker collection units per site, having assessed the 10 sites being proposed, a project plan of a project plan of 3 Days to get each unit/site operational would be feasible during the commissioning section. Thus, we would need about 4 weeks to get all the 10 sites up to speed

This covers delivery of all tiers, offloading, installation, commissioning and testing