



CBS
CASE
COMPETITION

Executive Summary : Novo Nordisk

Team Alchemist

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1 Introduction

In a world ripe with economic growth and decreasing birth rates, lifestyle borne diseases are an inevitability without the lack of proper prevention methods. The mind-boggling growth rates of the developing nations lead to rising demand for goods and services and it is imperative for corporations to come up with strategies to meet this demand.

Between 2015 and 2050, the proportion of the world's population over 60 years will nearly double from 12% to 22% and 80% of older people will be living in low- and middle-income countries. The market for diabetes, obesity, and other lifestyle diseases is still in its infant stages, with a distinct lack of awareness among the people regarding the health effects and treatment of these diseases.

2 Why New Markets?

Africa as a continent and Pakistan/Bangladesh have some of the highest birth rates, and since there is a direct correlation between Pregnancy and Type-2 diabetes, there is an imminent need for a strategy that focuses on Women in developing nations and their needs. South-East Asia, China, Japan are facing a crisis of ageing population and this calls for direct market capitalization. However, the economic conditions of the Asian nations are vastly different and it is wise to introduced low-priced alternatives for a minimum span of 3-5 years according to the nation.

3 Strengthening Leadership

Developed nations are host to a variety of 'Active' Patients and the initiation of 'Circular for Zero' ideals in the workings of the corporation would enhance the loyalty of the consumer base. The focus should be on displacing the disposable insulin syringe market with the reusable insulin pen to reduce the environmental footprint. Introducing new strategies for disposal of waste, either by collecting the waste at source, or providing discounts for those who safely return their waste to the store at the time of each new purchase will be beneficial.

4 Novo Nordisk App and E-store

To improve the retention rate of the customers, we will introduce an app that keeps will provide timely updates regarding dosage, amount of insulin remaining, and scheduled delivery of insulin to the customer per month or year. Linked with Google Fit or other third party fitness trackers, the app can deliver feedback regarding the well-being and socio-psychological observations of the patients. The app will track the patient location in cases of emergency requirement of insulin and provide the user with the nearest Novo Nordisk store.

A QR Code should be printed on every package to allow for easy download of Novo Nordisk app and obtain alerts with a simple scan. The QR code can be inscribed in the form of the Novo Nordisk logo for marketing purposes

An E-store for Novo Nordisk products with automatic scheduling and shipping of insulin medication according to the needs of each customer and the information obtained from the Novo Nordisk app would vastly improve the loyalty and retention of customers. The idea can initially be implemented in developed nation before modifying and implementing the strategy in developing nations.

5 Awareness and Market expansion

Since there is a crucial need for awareness regarding diabetes even in most urban areas, we can furnish free sugar check ups for the entire family of a diabetes patient that chooses Novo Nordisk. This allows us to tap into the uncharted markets of 460 million unaware diabetes patients.

Awareness drives can be conducted in semi-urban areas and early detection methods can be implemented through these drives. User-guides can be made available in local languages to penetrate the market of non-English diaspora.

6 Circular Economy

Penetrating the uncharted markets of developing countries and Asian Nations, there is a need for strategic production location to reduce the transportation costs and logistics. Production centres can be established in vital areas like South-East Asia, India and Africa.

Barring that, refilling centres for insulin can be established at strategic locations to meet the demand in densely populated areas and reduce the waste per each insulin dosage.

7 Financials of the strategy

It should be made so that it is profitable for a patient to choose a durable pen than to buy a new insulin syringe every time. The benefits of recycling, refilling, and reuse must outweigh the costs of buying a durable pen for there to be an incentive for the patient.



Growth Avenues

Bridging the customer gap

Out of ~493 million living diabetes, Novo serves ~29 million of them

New avenues of growth

Innovative products, new category of chronic treatment, market entry



Social Impact

Socio-psychological

Understanding social determinants and complex social matters

Holistic and Patient centric

Engagements with patients and serving low income groups



Environmental Impact

Zero footprint

Water, CO₂ emission, Resources, Renewable energy

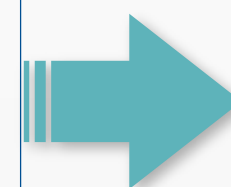
Circular Economy

Circular products, circular supply and circular company



KPIs

Financial
Social
Environmental



2025

2030

2050

460M

Customer Gap

The Rule of Halves

5 Core

Patient Needs

Diabetes - Not a Rich Man's Disease

90%

CO₂ emission by externals

0% Environmental Impact

Targeting

Dataset - <https://www.kaggle.com/uciml/pima-indians-diabetes-database>

This dataset is originally from the National Institute of Diabetes and Digestive and Kidney Diseases. The objective of the dataset is to diagnostically predict whether or not a patient has diabetes, based on certain diagnostic measurements included in the dataset. Several constraints were placed on the selection of these instances from a larger database. In particular, all patients here are females at least 21 years old of Pima Indian heritage.

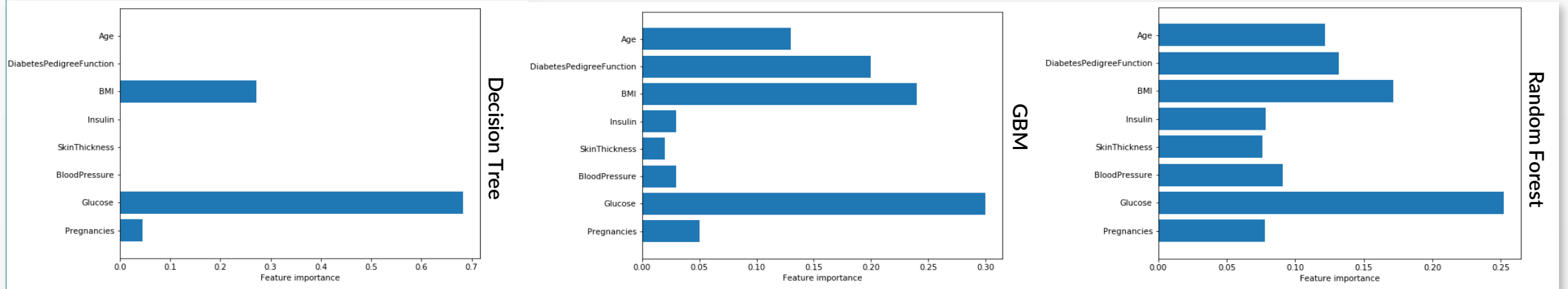
Dimension : (768,9)

Outcome : (1: Yes; 0: No) | (500; 268)

Models : {Logistic Regression, Decision Tree, Random Forest, GBM}

Accuracy : {~80% Training Set; 75%-77% Test Set}

Important Observation : {Feature Importance: Pregnancies}



Hypothesis

We are proposing Pregnancy to be a **Cause**, Diabetes (Outcome) as **Effect**.

Gestational *Diabetes is diabetes* developed during *pregnancy*. Women with Gestational *Diabetes* are at risk for developing **Type 2 Diabetes** [1]

Observation

Sample Population is of **Females** of a predominantly **Developed Country(Western)** When females are considered, **BMI, Age** and **Glucose** levels have higher weightage However, **Pregnancies** are ~5% important and hence a Probable **Target Group**

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outcome
0	6	148	72	35	0	33.6	0.627	50	1
1	1	85	66	29	0	26.6	0.351	31	0
2	8	183	64	0	0	23.3	0.672	32	1
3	1	89	66	23	94	28.1	0.167	21	0
4	0	137	40	35	168	43.1	2.288	33	1



Asia's Ageing population set to 25-30% by 2035, with Japan, China, Singapore leading



Africa's population set to reach 3 times that of Europe by 2050

Blue Oceans

Developing Countries : South-East Asia

Others : Bangladesh, Pakistan and African Continent

Trends : {Ageing Population; Low-Middle Income groups; High Birth Rate}

Strategy : {Pricing Alternatives for each income group; Pregnancy as an important Patient group}

Initiatives : {Focus group initiatives and Economies of scale}

Africa as a continent, and Pakistan/Bangladesh are hot-spots for world's highest birth rates, which is a indicator of pregnancy and its importance. However, the economic conditions of these nations are certainly not alike Developing Nations. Hence, a low-priced alternative(\$4) is tentative for a minimum of 3-5 years span in these countries. This will result in market penetration.

South-East Asia and China in Particular are facing a crisis of ageing population, with Japan. This calls for direct market capitalisation, supported by pricing alternatives.

Red Oceans

Developed Countries : USA, Japan & European Nations

Trends : {Need for Patient Care; Societal Support System} Active Patients

Strategy : {Retention; Service Capabilities; Innovative Products; Reduced Complexity}

Initiatives : {Environmental and Social Impact of Circular Zero}

Since the developed countries are associated with Active Patients, it is certain to initiate 'Circular Zero Economy' from these developed nations with all possible favourable combinations of Loyal Customer Base to R&D and Technical Innovations.



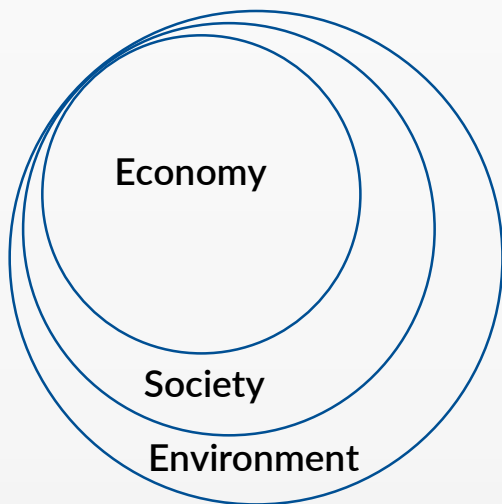
Free Market Approach; Pharmaceutical Industry



Environmental & Social Circular Zero 60%-70% Market Penetration

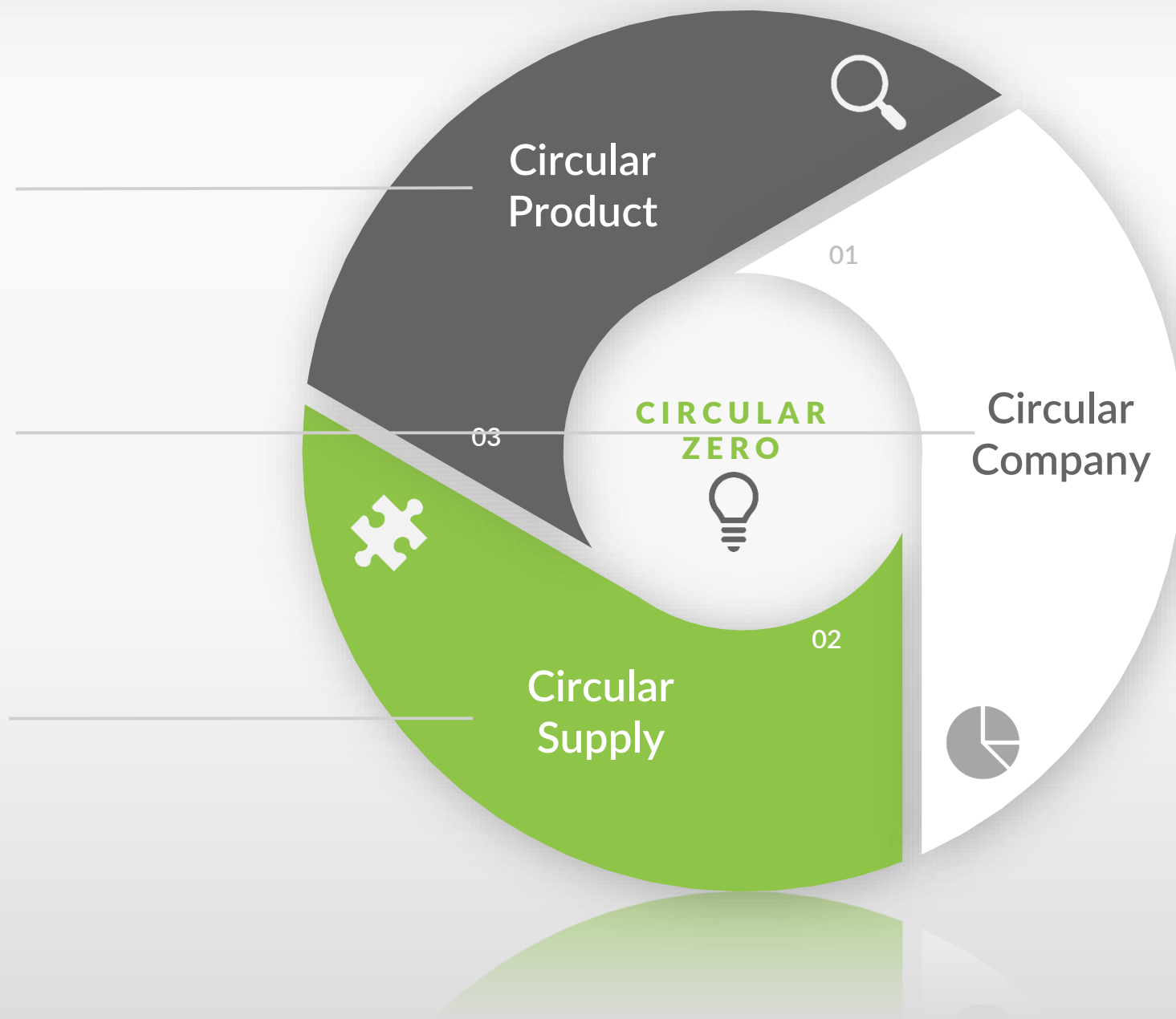


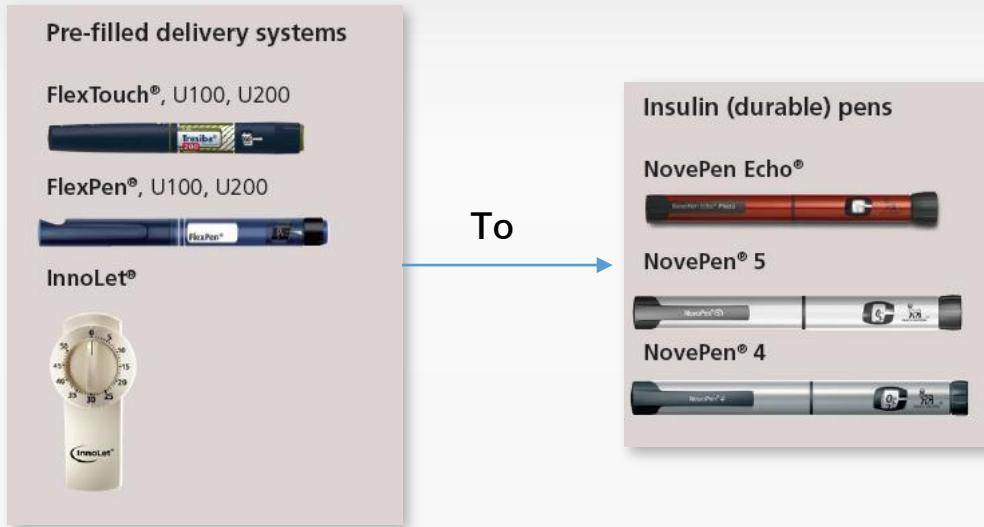
- Single use to Re-use pens
- User guides in local languages



- SE Asia, Asia : Production site
- Refilling Site : Strategic locations

For this kind of investment into long-term assets, Novo Nordisk has the financial stability and backup of Net profits and Equity terms with Novo's own foundation





Condition where customers prefer to buy pre-filled pens over durable pens-

Cost of Pre-filled Pens = Rs X

Cost of Durable Pens = Rs Y

Where, $X < Y$

Since Diabetes is a Chronic Disease, Customers shall buy durable pens for re-usability
However, Pre-filled pens being cheaper, are preferred over re-usable pens.

Let a customer buy 5 pens a year-

Cost of Pre-filled Pens = $Rs\ X * 5$

For 20 Years of buying-

Cost of Pre-filled Pens = $Rs\ X *(5*20) = Rs\ 100\ X$

Let cost of new refill for a durable pen = Rs Z,

Where $Z < Y < X$

If the customer buys durable pens for 20 Years,

Cost of Durable Pens = $Rs\ (Y+100*Z)$

By Mathematical intuition, it is noted that **$Rs\ (Y+100\ Z) \ll Rs\ (100\ X)$**

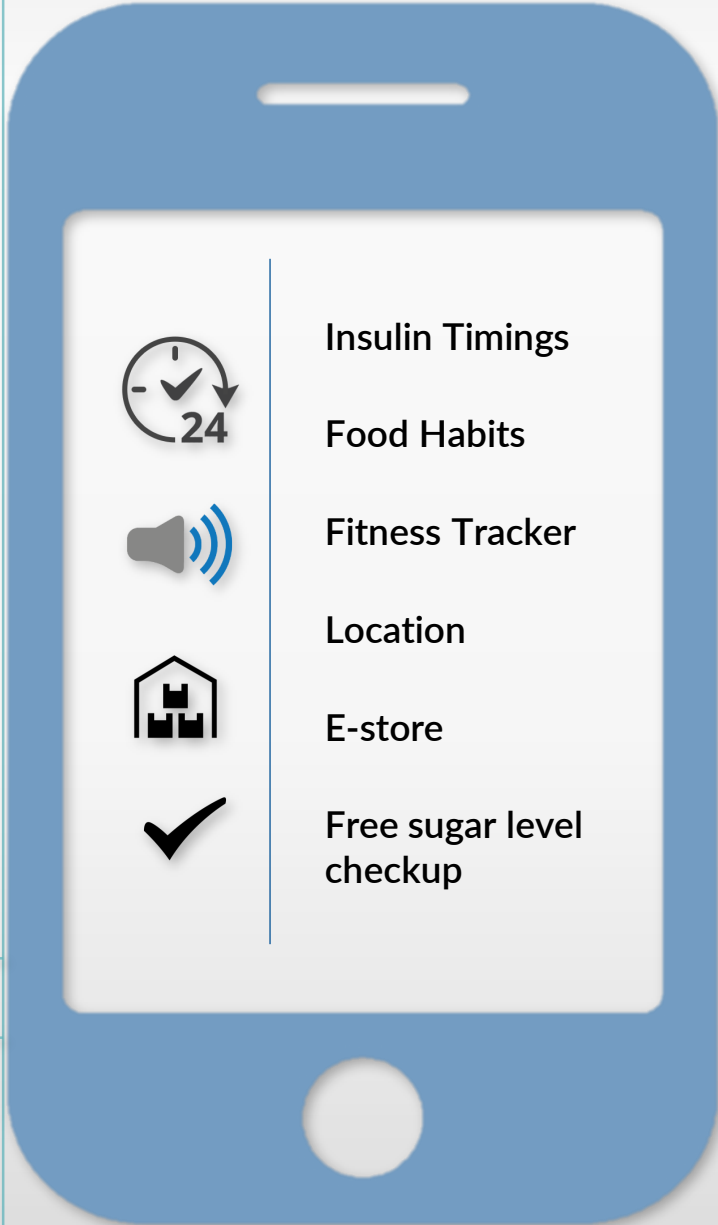
Hence it is **Profitable**
for a patient to choose
a durable pen and keep
refilling the pen, than
to buy a new pen each
time



- Scan to download the Novo Nordisk App!
- Scan to add this new pen to your usage dashboard in the app

Adding the pen to usage dashboard will add the pen to Insulin Timing portal of the app. This shall then be monitored according to the Amount of dosage and #'s of dosage taken.

With each new pen/refill, scan and add it to the dashboard for timely feedbacks.



Insulin Timings/Report

This will give timely update of dosage, insulin left, and scheduled delivery per month/year
 Most of the diabetic patients complain of not having a alert system as to when they need to refill/buy a pen.



Food habits and Fitness Tracker

Linked with Google fit or any third party fitness product database. This gives feedback of well-being and socio-psychological observation of patients.



Location and E-store

The app will track(with permission) patient location for emergency requirements of insulin dosage(if any) with alert system for dosage left with respect to change in locations. This gives idea of where to visit for nearest store of Novo Nordisk Product.
 E-store provides e-commerce like platform for patients to buy the products.



Free sugar-level checkup

With each app account, there will be free sugar-level checkup service for two family members once a year.
 The constraint layer shall be, all three members belonging to the same family.
 This kind of checkup will increase customer satisfaction and add to Market Expansion if any of the family members is diagnosed with Diabetes too, post checkup; Supported by the fact that Diabetes and other chronic diseases have their roots in hereditary traits that are passed from parents to offsprings.

Operations in Product Supply

Customers and Patients

Overview

Research

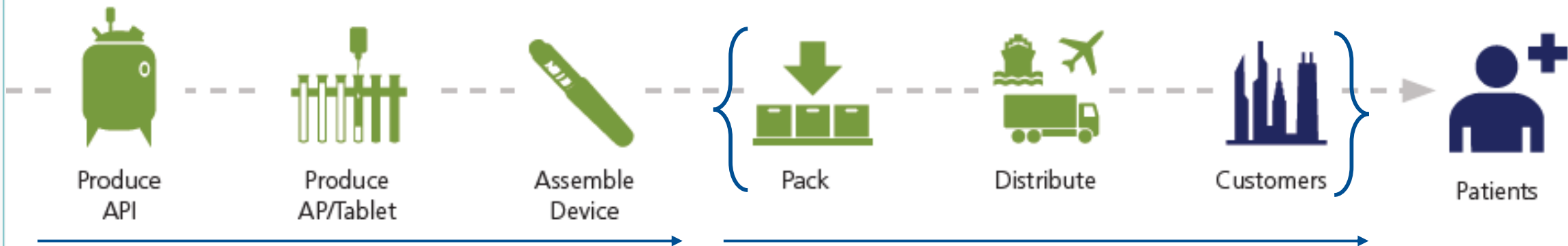
Segmentation

Circular Zero

Suggestions

Mobile App

Zero Footprint



Almost 0% Environmental Impact

90% Carbon Emissions and Single use Plastics

Renewable energy solutions for Office Buildings

- Rainwater harvesting system in buildings for watershed management
- Solar energy panels on the roof of buildings to power the facility with green energy

Patient's wastes

We have suggested strategic locations for refill sites, say, at very dense demand demographics – Africa, SE Asia. These refill sites will be in tandem with the supply-chain model from the site to customers and vice versa.

The return supply leg will bring the wastes (injection and other single use plastics) back into the value chain. Hence a complete circle.

Types of Suppliers/Distributors : Third Party

Issue with third party distributors : Regulations for Environmental Impact

- Use of Electric Vehicles for Supply-Chain
- Initiatives for distributors if they bring back all the single use plastics back to the plant/warehouse when returning for stock refills.

Brought back wastes can be weighed and with the difference of # of items sent and weight of waste received, initiatives can be lend over to suppliers.

Say, if the Supplier/distributor brings back 90% of the waste generated from his side, he gets atmost 5% discount on next consignment.

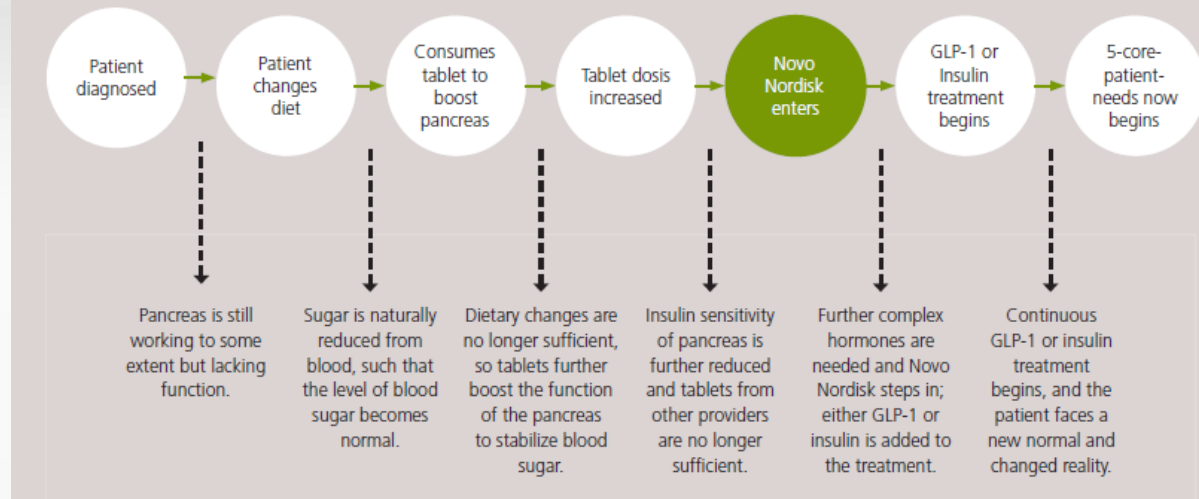


Environmental usage guide

Most of the patients of the developed and developing countries are well-educated. Hence, to raise the social and environmental concerns, its better to have a reading guide of usage to reduce the footprints of used products.

Awareness drives in mid-urban areas

Diabetes and Chronic disease awareness with its roots in hereditary consequences, awareness drives can actually give better footfall in Underdeveloped countries of Africa and SE Asia.



Early Diagnosis

Most of the patients don't know about their condition and diagnosis of Type 1 or Type 2 Diabetes. This happens as Novo enters the timeline very late, post the tablet dosage increase.

This can be handled when Novo enters the timeline from an end-to-end solution perspective, i.e from Diagnosis to Circular Economy services, with just supply-chain in the hands of third party entities.