ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

ΣΧΟΛΗ ΔΙΟΙΚΗΣΗΣ ΕΠΙΧΕΙΡΗΣΕΩΝ
SCHOOL OF BUSINESS
ΤΜΗΜΑ ΔΙΟΙΚΗΤΙΚΗΣ ΕΠΙΣΤΗΜΗΣ & ΤΕΧΝΟΛΟΓΙΑΣ
DEPARTMENT OF MANAGEMENT SCIENCE & TECHNOLOGY

HELLENIC REPUBLIC
National and Kapodistrian University of Athens

BUSINESS PLAN

Greece, June 2022

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Drug n Drop

"Every pill matters!"

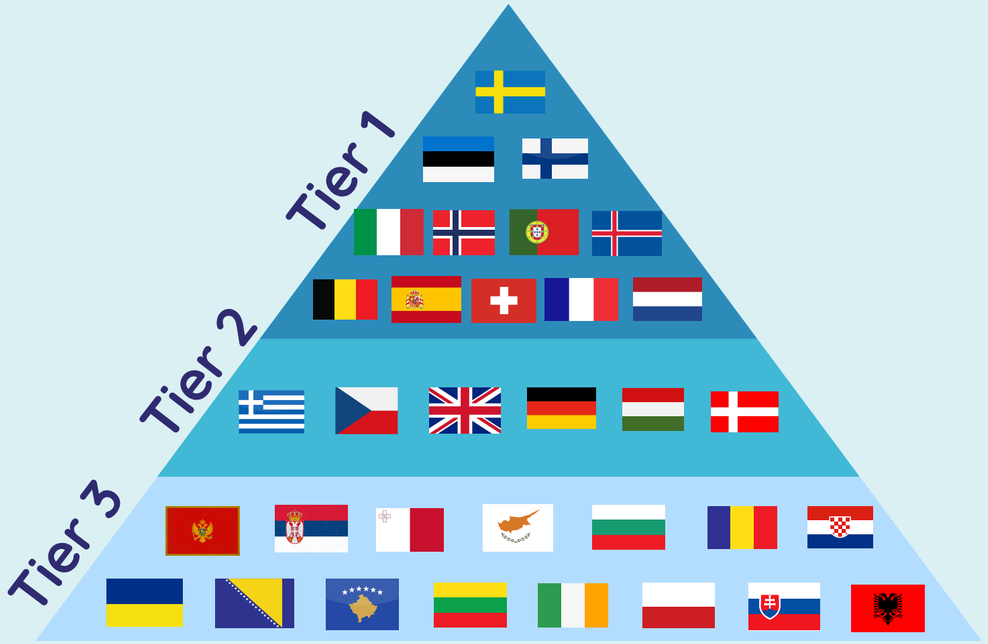
JA Europe
Member of JA Worldwide

The Problem

Drug n Drop

The global problem that Drug n Drop addresses, concerns the **pharmaceutical industry** (valued at $ 1,27 trillion) and in particular, **the vast quantities of drugs that expire and get disposed remaining unused.** This problem has significant economic, environmental and social impact as analyzed below.

The **economic dimension** of the problem is evidenced, first, by the enormous amount of unused medicines disposed worth over $ 5 billion in the USA alone (Source: University of Chicago). Secondly, there is the environmental **dimension**, as 15% of the medications disposed are toxic for the environment (Source: WHO). Finally, there is a **social dimension**, because while medicines are disposed massively, over 5 billion people worldwide lack access to essential medicines (Source: UN).



The pyramid classifies the European countries into 3 Tiers based on 2 criteria, their **operational efficiency** on pharmaceutical waste management and **public sensitivity**. The aim is to show the extend of the aforementioned problem to each one of them.

Tier 3 consists of countries that score low on both criteria, while in **Tier 2** there are countries that score high on only one of the criteria. Finally, **Tier 1** consists of countries that score high on both criteria.

$1,27 trillion
worth of the Pharmaceutical Industry

15%
of disposed drugs
are toxic and harmful for the environment

5 billion
people
lack access to the essential medicines

The Solution - Drug n Drop

The product of Drug n Drop is a **complete smart system for the management of expired medicine**, capable of collecting and processing data, thanks to integrated sensors and scanners. These data concern pharmaceutical waste (packages of expired drugs) of the organizations and helps them optimize the management of their medicines.

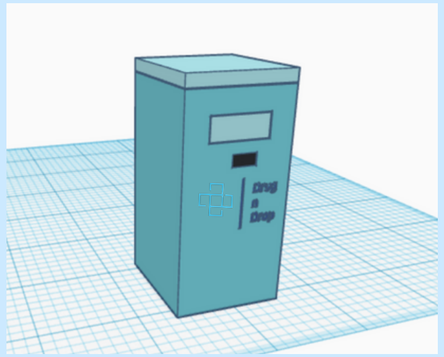
Drug n Drop's customers include **pharmaceutical manufacturers, end consumers, pharmacies**, **hospitals**, **nursing homes**, and any other organization that manages medicine on a large scale. Drug n Drop's smart bin is supported by the addition of mobile app, from which the entire system is controlled, reports are displayed, and the communication between the previous and next steps in the value chain take place. In this way, we not only provide a complete solution to the global problem of drug management, but also create environmental value, as less pharmaceutical waste ends up in nature, and social value, as we harmonize the global demand and supply of medicines and help the organizations that provide them to operate efficiently.

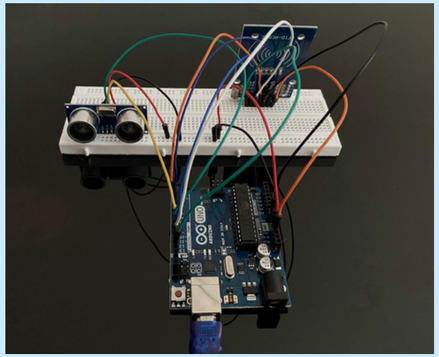
As for the system's **hardware**, it consists of a smart bin, equiped with a barcode scanner, to recognize each medicine. It also has a distance sensor, to continuously monitor the capacity of the smart bin and a humidity & temperature sensor, to inspect the internal condition of the bin. Moreover, the system has a weight sensor, for counting the number of tablets in the blisters of each pack and RFID based access control, that allows access only to authorized users. All of the above are coordinated by the integrated Arduino, which makes our bin smart, and shares the collected data with the Drug n Drop app, where it is analyzed and turns into useful reports.

The **software** part consists of the interactive user-friendly Drug n Drop mobile app, which allows authorized users to monitor the current status (capacity) of the smart bin and receive monthly and annual reports, with useful insights, that derive from the analysis of the organization pharmaceutical waste. Moreover, they have the ability to communicate with the previous stages of the value chain (e.g. drug manufacturers), in order to harmonize the demand with the supply of medicines, to optimize the management from the organizations-customers.

The same mobile app is also used by end consumers, who can use it to scan their expired medicines. If the scanned expired medicines are subsequently dropped of at a pharmacy and thrown into the Drug n Drop bin, they receive points based on the app's incentive system. Finally, the incentive system used is similar to Sweden's, which is one of the most successful in Europe.

IoT enabled Pharma Collecting Unit (Smart Bin)





Mobile Service

Interactive Prototype Link

Commercial Video Link

Team & Stakeholders

Drug n Drop

Team

Now

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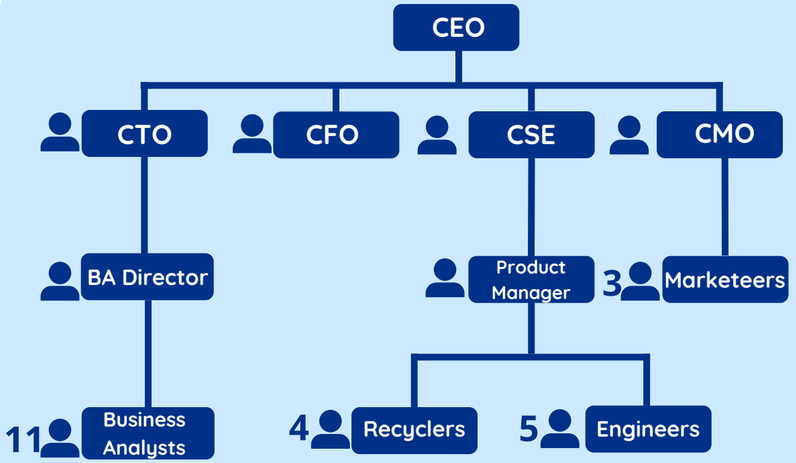
Product Manager
B.Sc. in Pharmacy, UoA

Future (our vision)



On the left you can see, firstly the **composition** of our **current team** which is characterized by overlap and cross-field knowledge and secondly our **vision** for the **organizational structure** in 5 years.

Below you can see the **main stakeholders**, which are all the stages of the **pharmaceutical value chain**, but also selected **strategic partners**, **NGOs** and **governments**.

Stakeholders

Customers

End consumers

Pharmacy

BAYER

NOVARTIS

Johnson & Johnson

Pfizer

Suppliers/Partners

Recyclers

Ministries of Health

Logistics

* ΚΥΚΕΤ

E-BUSINESS RESEARCH CENTER
ELTRUN
ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

Society/Gov/NGO's

Government

OXFAM

MEDECINS SANS FRONTIERES
DOCTORS WITHOUT BORDERS

The Global Fund

Society

GIVMED
Share medicine Share life

HAI
HEALTH ACTION INTERNATIONAL

* The organization that manages pharmaceutical waste for our country, Greece

Our Operating Model

Drug n Drop

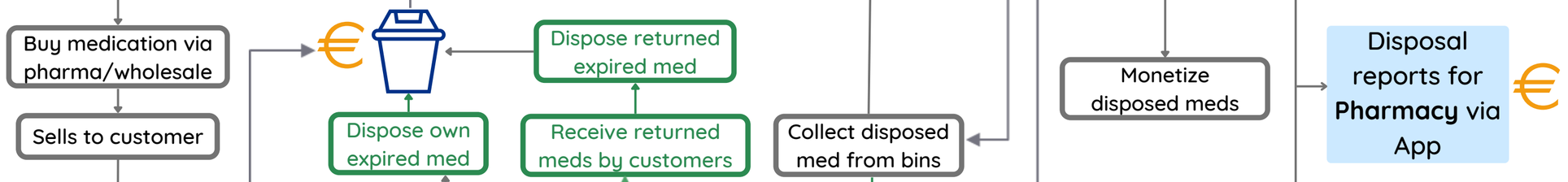
Stakeholders

Value Proposition

Big Pharma

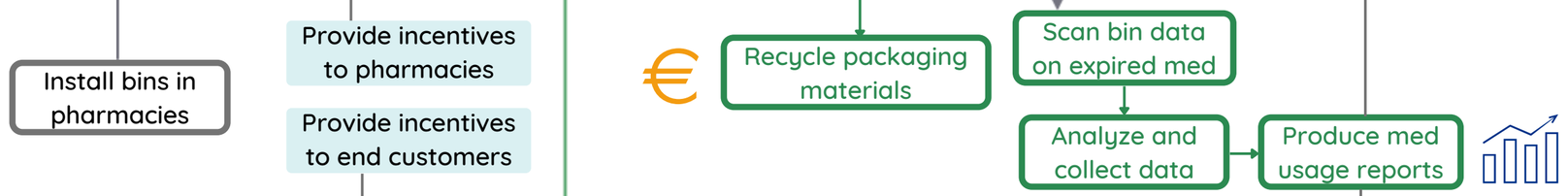
- Optimization of medication production
- Price reduction
- Waste minimization

Pharma-cies



- Optimization of medication management
- Promote sustainability
- Financial incentives through App point system

Drug n Drop



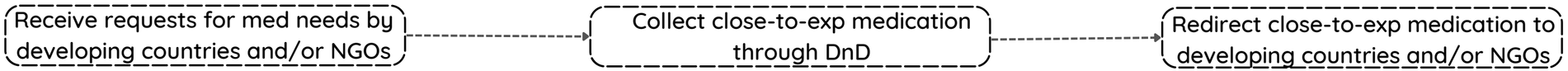
- Med usage data for pharma
- Incentivization of end consumer and pharmacy to recycle sensibly
- Promote sustainability

End Consumers

- Usage history for monitoring purposes
- Financial incentives through App point system

NGOs

future



- Cover medicinal needs of developing countries
- Social value
- Sustainable future

innovation | problem | end product | future vision | € monetization item

Market & Competition

Our target market

Pharmacies

10.342
pharmacies in Greece

9.6%
of the Greek market

97.000
pharmacies in Europe

2.25%
of the European market

Big Pharma

30.000
pharma manufacturers

90 partnerships

Competition

	Drug n Drop	IOET	CLEANAWAY Daniels	Cactus	RELUX UMWELT	business waste.co.uk
Mobile App	✓	✗	✓	✗	✗	✗
IoT Sensors	✓	✗	✗	✓	✗	✗
Data Analytics	✓	✗	✗	✗	✗	✗

S Analytics provision, process automation, ESG compliance

W High cost, many stakeholders, public sector barriers

O Inefficiency of current practices, lack of integration in the SC

T Changing local regulations, lack of public sensitivity

Our **competitive advantage** derives from the **data analytics** and leveraging **real data** from the pharmaceutical waste. It is essential for the pharmacies and pharma manufacturers, who manage medicine massively, to obtain information on the type and quantity of medicines that are disposed.

Drug n Drop

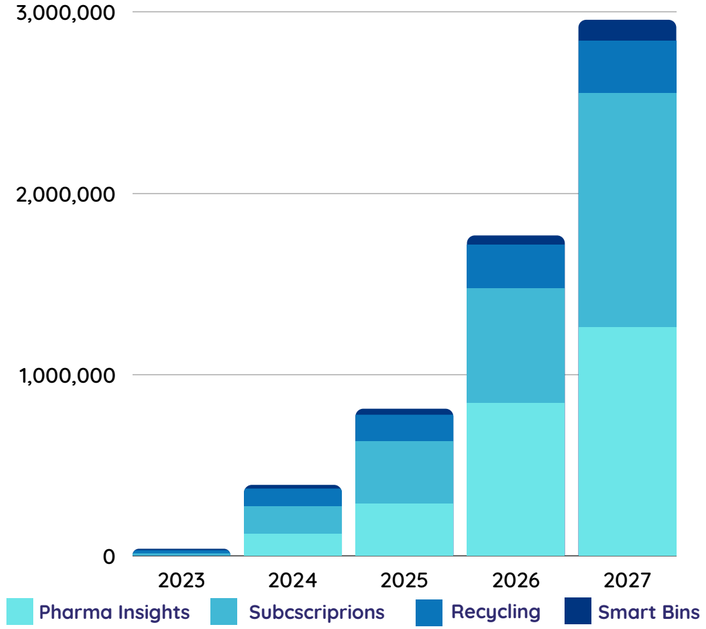
Marketing & Distribution Strategy

	Product Characteristics	Pricing Strategy	Communication Strategy	Distribution Strategy
Pharmacies	**Smart Bin** • Materials: PP, PVC, HDPE • Dimensions: 50 x 50 x 100cm • HC-SR04 distance sensor • AM2320 I2C temperature and humidity sensor • Proficon Weight Sensor 1 • RFID based access control • Barcode scanner (and back-end mini ERP) **App** • Monthly/annual reports • Data per pharmacy and per medicine	**Smart Bin** • 100 € per product • "Try before you buy": Free installation and trial for the first month • Low price, many customers **App** • 50 € per month • First month free trial	**Smart Bin** • Customer service via email, phone, website • Customer service through the Salesforce patform • Visits to pharmacies • Leads creation in conferences **App** • Technical support • Satisfaction surveys • Proper usage report	**Smart Bin** • 1 smart bin per pharmacy • Could be more than 1 smart bin for other organzations • Drug n Drop members install the smart bin • Outsourcing of the collection of the smart bin's waste **App** • One administative profile per pharmacy • Google Play Store, App Store
Big Pharma	**Pharma Insights** • Quarterly reports • Data per company and per medicine • Data from 70 points (year 1) • Real big data provision	**Pharma Insights** • Annual subscription for quarterly reports • Year 1 (2024): 10.000 € • Year 2-3: 12.000 € • Year 5-... : 14.000 €	**Pharma Insights** • Pharmaceutical conferences • Funding programs • Bidding in competitions • Participation in Bayer's Level Up hub program	**Pharma Insights** • One Account Manager per 5 pharmaceutical manufacturers
End Consumer	**App** • Rewards for disposing medicine monitored by QR Code scanning • Display user's activity	**App** • Free of charge	**App** • Technical support • Satisfaction surveys	**App** • One profile per user • Google Play Store, App Store

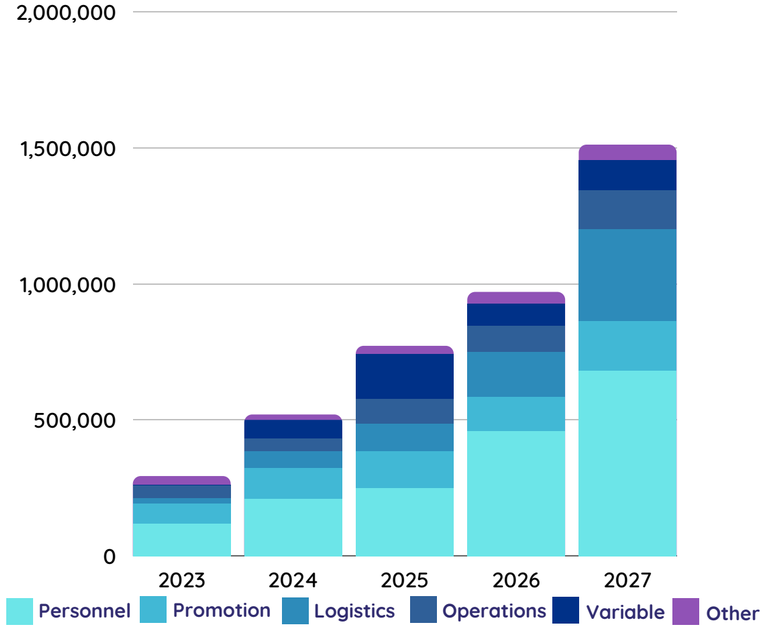
Financials

Drug n Drop

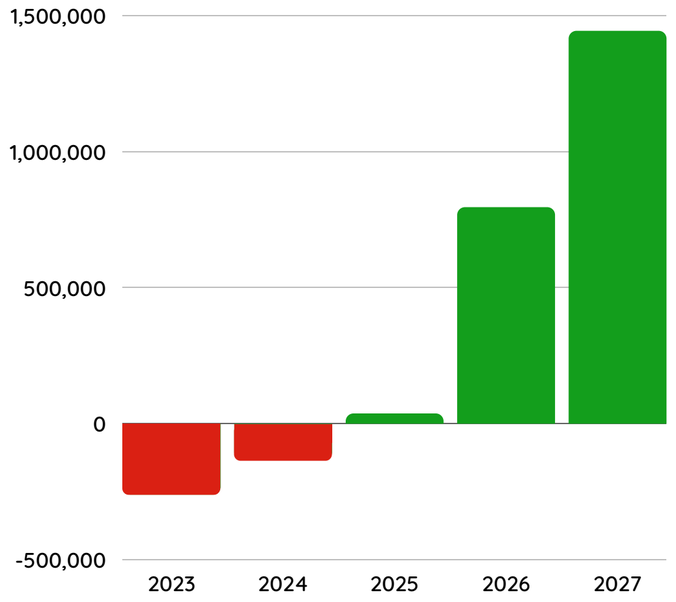
Sales per Revenue Stream



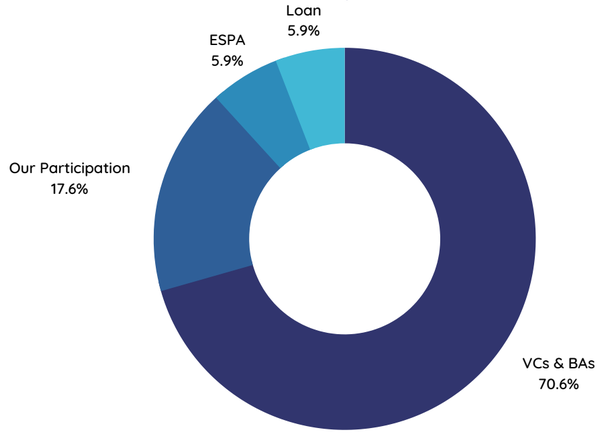
Expenses per Category



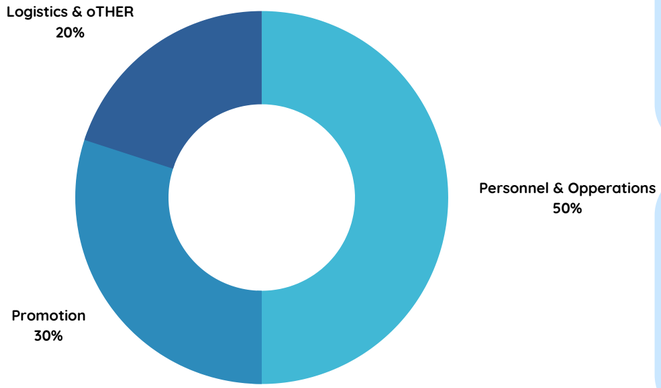
Profit



Investment required: 240.000€



Use of funds



Break-even point: end of 2nd year (2025)

- 24 pharmaceutical manufacturers
- 600 pharmacies
- 762.338€ revenue

5-year vision (2027)

- 90 pharmaceutical manufacturers
- 2.250 pharmacies
- 9.6% Greek market share
- 2.25% European market share

Timeplan

Drug n Drop

Stage 1: Preparation

May

May 2022
Completion of detailed **research** in **53 Greek pharmacies**, which aimed to acquire data about the current medicine waste management practices in Greece, but also to collect feedback about the designing Drug n Drop system.

May 2022
Software Design: Validated

Initial Proof of Concept: Completed

Hardware Design: Ongoing

June

03/06/2022
Acquisition of the **1st place** in the **national finals of JA Greece**, from which an **initial funding** was given, along with the **support** of selected **consultants** and **mentors**.

July

12-14/07/2022
Participation in the **GEN-E 2022** and creation of **valuable corporate assets** (ex. website, trademark, patent request etc), during the **preparation period**.

30/07/2022
Completion of the **MVP**, both for the **application** and for the **smart bin**, which will be ready to be presented in the **upcoming exhibitions** and **conferences**.

Sep - Oct

Sep - Oct 2022
Participation in the **pharmaceutical product exhibitions** Expopharm (Munich, 14-17/09) and ipharma (Boston, 20-21/2022), aiming to **present Drug n Drop's system and create leads.**

Our Timeplan consists of **2 main parts.** The first lasts 1 year and includes all the **necessary steps** for the **development** of Drug n Drop and its product, to the point where the **company** is **ready to go to market**.

Stage 2: Market Entering

Nov

Nov 2022
Efforts to enter the **Bayer's "Level Up" hub program**, where we can further **develop** our **business plan**, based on the deep understanding of our **customer's needs**.

2023

Sep-Dec 2023
Initial sales of the Drug n Drop system in the **Greek pharmacies**, with which **close contacts** have already been developed **during** the completion of our **research**.

2024-2025

2024-2025
Continuation of the **ongoing operations** and **strategic actions**, to further **penetrate** in the **Greek market**, aiming to **acquire the 9,6%** of it by the **end of 2027**.

2026

2026
First part of **internationalization**, with the entrance of Drug n Drop to the markets of **Cyprus** and **Malta**, which are **similar to the Greek,** mainly due to the **many per capita pharmacies** and the **malfunctional processes.**

2027

2027
Second part of **internationalization** and entrance to the big and attractive markets of **Germany** and the **UK**, which were **classified to Tier 2** from our research. The **target** is the **acquisition of 2,25%** of the **European market** by the **end of 2022**.

The second is considered an estimation for the **development** of Drug n Drop's **sales** and **target markets** for the **next 5 years**. Finally, the Timeline is presented at a high level, **containing only the key benchmarks**, to provide an overview of the **development of Drug n Drop.**

Marketing Reasearch & Assumptions

Drug n Drop

List of assumptions

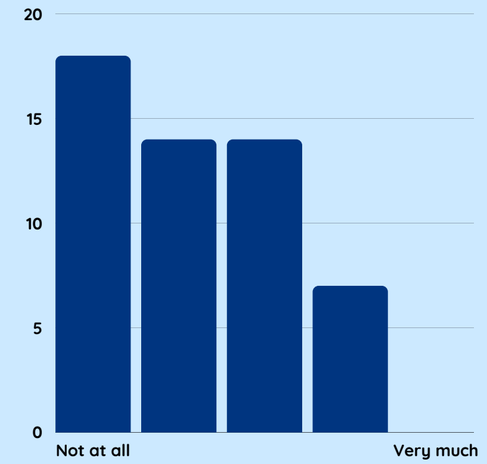
Below you can see the results of our quantitative research in Greek pharmacies. The research occured under the following assumptions:

- **25% of medicines in Greece are wasted:** Source IFET, confirmed with a qualitative analysis with 5 pharmacies
- **1 month to generate profit for the pharmacies:** the first month of subscription is free (try before you buy service)
- **The current business practice for pharmaceutical waste management in Greece is inadequate**
- **Only pharmacy owners were allowed to answer the questionnaire.**
- **Most pharmacies were in Athens and its suburbs.**

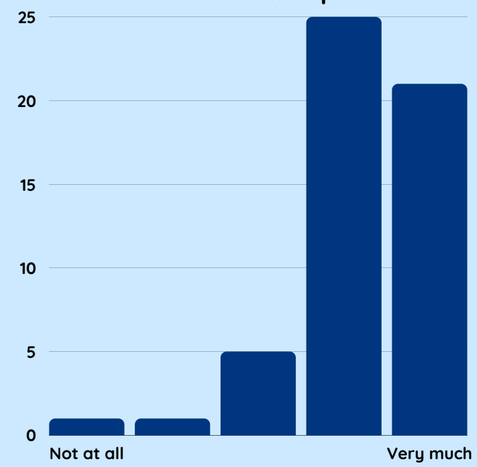
Marketing research

Research methodology: Quantitative research with questionnaires, n = 53, Target audience: Greek pharmacies

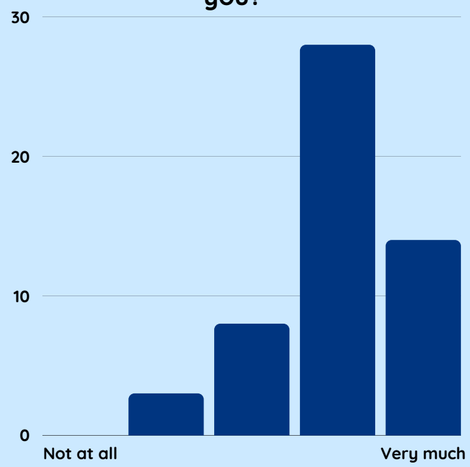
If you are currently using IFET's green bin, how satisfied are you with this practice?



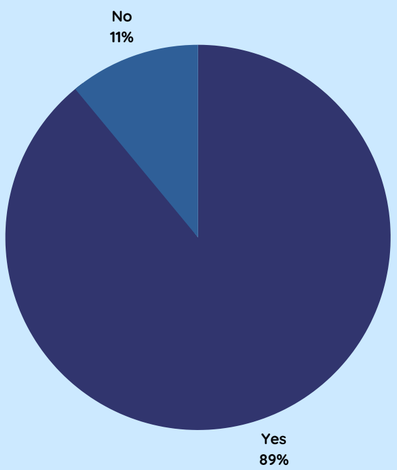
To what extent do you think the current way you manage your pharmaceutical waste needs to be improved?



Based on the description, do you think the Drug n Drop solution would benefit you?



If the Drug n Drop smart bin was provided to you for free, would you agree to use it?



Conclusion & Key Takeaways

Drug n Drop

Achievements so far

Junior Achievement Greece Winners

Shortlisted for Novartis Digital Health Innovation Award

Initial Proof of Concept completed

Trademark submission completed

Problems & how we solved them

Pricing Strategy

The definition of Drug n Drop's pricing strategy was initially hard to identify. To overcome that, we thought that as a big data firm, we need a lot of data from multiple points and that would be easier to achieve with low prices for the smart bins and subscriptions, but also with services "try before you buy".

Addition of weight sensor

One exception that was hard to handle was the accurate and automatic counting of remaining tablets in expired packs. The solution came from the Novartis jury during our the Digital Health Innovation Award interview, where we were suggested to add a weight sensor to our smart system.

Key people/enablers in the process

Advices from world-famous Brand Stategist Peter Economides

Marketing research with the help of ELTRUN and ACEIN

EY

Advices from Ernst & Young consultants

Next steps & requirements for success

Redirection of the medicine close to their expiration date to developing countries, who lack access to medicine

Liscences regarding local regulations compliance

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