

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Management



Bachelor Thesis

Business plan

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BACHELOR THESIS ASSIGNMENT

Danny Višvader

Economics and Management

Thesis title

Business Plan

Objectives of thesis

The aim of the bachelor's thesis is the economic evaluation of the business idea based on the development of a business plan.

Methodology

The economic evaluation of the business idea will be developed based on the development of a business plan according to the structure that will reflect the theoretical part of the work.

The proposed extent of the thesis

30 – 40 pages

Keywords

Business Plan, Home Gardening, Evaluation, Business Idea, Start Up, Business, GreenPanel, MyGarden.

Recommended information sources

ABRAMS, Rhonda. Successful business plan: secrets & strategies. 7th edition. Palo Alto, California: PlanningShop, [2019]. ISBN 978-1-933895-82-6.

SPENDER, J.-C. Business strategy: managing uncertainty, opportunity, and enterprise. Oxford: Oxford University Press, 2014. ISBN 978-0-19-968654-4.

ŠVARCOVÁ, J. *Ekonomie : teorie a praxe aktuálně a v souvislostech 2002/2003*. Zlín: CEED, 2003. ISBN 80-902552-6-4.

WIRTZ, Bernd W. Digital business and electronic commerce: strategy, business models and technology. Cham: Springer, [2021]. Springer texts in business and economics. ISBN 978-3-030-63481-0.

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Declaration

I declare that I have worked on my bachelor thesis titled "Business Plan" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on 15.03.2023

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Business plan

Abstract

The objective of the bachelor thesis is to financially evaluate a business plan and to decide whether it has a chance to withstand the competitive environment on the market. The planned business activity is to provide an app based on freemium model and own tangible products in an agricultural industry on a home gardening market. The bachelor thesis is split into three parts: Literature review as a theoretical part, business plan as a practical part and conclusion summarizing the outcomes of the bachelor thesis.

The theoretical part includes everything that has been taken into consideration from different types of business entities to the risk evaluation of the business idea. The business plan is in accordance with what a potential investor might want to know about the business to evaluate it on his own. And finally, the conclusion summarizing all the data to determine the feasibility of the project.

The result of the bachelor thesis concludes the financial unfeasibility of the project due to high investment requirements, low potential yields and high level of uncertainty leaned towards negative outcome of the project.

Keywords: Business plan, home gardening, evaluation, business idea, start-up, entrepreneurship, GreenPanel, MyGarden.

Podnikatelský plán

Abstrakt

Cílem této bakalářské práce je finančně zhodnotit podnikatelský plán a rozhodnout, zdali má šanci odolat kompetitivnímu prostředí na trhu. Plánovaná podnikatelská činnost je poskytnutí aplikace na bázi “Freemium“ modelu a prodeje vlastních hmotných produktů v agrikulturním průmyslu na trhu s domácím zahradničením. Bakalářská práce je rozdělená do tří částí: Literární přehled jako teoretická část, podnikatelský plán jako praktická část a závěr jako souhrn všech výsledků bakalářské práce.

Teoretická část obsahuje vše, co bylo bráno v potaz od různých typů obchodních subjektů po zhodnocení rizik podnikatelského nápadu. Podnikatelský plán je v souladu s tím, co by potenciální investor mohl chtít vědět o onom podnikání, aby si situaci mohl zhodnotit sám. Na konec, závěr, který shrnuje všechna data k určení proveditelnosti projektu.

Výsledkem této bakalářské práce je finanční neproveditelnost projektu z důvodu potřeb vysokých investic, nízkých potenciálních zisků a vysokou mírou nejistoty, což je nakloněno k negativnímu závěru projektu.

Klíčová slova: Podnikatelský plán, domácí zahradnictví, vyhodnocení, podnikatelský nápad, start-up, podnikání, GreenPanel, MyGarden.

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1 Introduction

Throughout the years, almost every single person on this planet has had the chance to encounter the technologies of today. For some rare individuals it may have been only for a couple of moments, for some minutes a day and for most of us almost half a day each day. If it is scrolling through social media, playing games, or simply just working, we as people became the people of technology. It brings people together, but also further away, it solves many issues but brings many others. The idea that many people have thought of is how to get rid of this addiction or overuse of technology to bring peace to people and nature again. This bachelor thesis is about working out a business plan to introduce to investors to secure investments for the development of the actual project. With today's globalization it has never been easier to turn an idea into reality. Saying "easier" does not necessarily mean easy, in fact turning an idea into a business is most of the time particularly challenging, physically, and mentally. Constantly creating mental notes and calculating outcomes while taking into consideration all the externalities, that is something a business owner cannot go around, to minimize the vast amounts of pieces of information being stored in the head taking up space, the business plan needed to be created to outline the entire process. This story-like introduction sets a beginning to a project of cooperation between technology and nature, a balance which lets people slow down and helps them with their own development. In the theoretical part, a summary from a literature review has been made providing an outline of the whole document. It includes all the aspects of a company to increase the chance of success and to give the reader an overview of everything that has been taken into consideration while creating the document. In the theoretical part, all the details of the project in accordance with the theoretical part have been worked out and summarized into the document. The overall purpose of the practical part was to create a business plan in detail. It provides the general description of the project, several types of analyses like competitors, markets, targeted audience, calculations regarding the financial aspect of the company, the deployment and many different plans giving a structure of the future realization while taking many risks into consideration.

2 Goal and methodology

2.1 Goal

The goal of this bachelor thesis is to evaluate the possible company's presence on the market. Whether the business is economically feasible, sustainable, and most importantly profitable firstly in the Czech Republic and secondly the rest of the world. The final evaluation of the project considered a start-up is based upon the further described business plan.

2.2 Methodology

To successfully present a solid reasoning for the result of the bachelor thesis, multiple methods must be deployed to objectively evaluate the potential outcome in the conclusion of the bachelor thesis which is split into three parts, literature review, practical part, and conclusion. Literature review encompasses the description of a business environment through the definition of business defined by the Czech Republic's trade act. The business plan structure is according to Srpová (2011) and it contains definitions which are expanded upon in regard to the company in the practical part of the bachelor thesis and it acts as a standalone document to be presented to a potential investor to obtain financial support amounting to the result of the financial analysis which incorporates the initial investment requirements, monthly expenses, cost of development within the first 3 years, cost breakdowns of the products and finally the break-even analyses based on the calculated contribution margins from the sales price which is determined by the cost according to the markup pricing strategy and the cost of aggregating components sold by an online retailer Alibaba.com thanks to which the business plan includes the number of products needed to be sold every month and the amount needed for investment in the upcoming 3 years. PESTLE analysis of the Czech environment has been conducted to gain overview of the domestic environment. The estimation of market size is based on the data collected from Google Maps within the Street View feature in three locations in the Czech Republic and calculated thanks to data provided by the Czech Statistical Office. The competition analysis in the Czech Republic has been conducted and competitors found through Google search engine by combining search words narrating the project created by the author:

Automatické zavlažování, samozavlažovací květináč, samozavlažování. samozalévání, květináč, automatický květináč, vertikální zahrada, domácí zahrada. To help to forecast the company, project realization plan has been put together. It includes already mentioned financial plan which evaluates the financial feasibility, development and manufacturing plan which describes the plans for the upcoming years on how to execute the project after securing investment through available methods and which describes the development within the first year and prototyping plans based on the author's experience. Last part of the business plan covers the SWOT analysis which has been conducted to evaluate all theoretical aspects of the products offered based on the author's objective perception of the products offered. The conclusion summarizes all the aspects considered in the bachelor thesis into a single evaluation of financial feasibility of the project which resulted in too high costs and too low promised yields with high level of uncertainty signified by the SWOT analysis.

3 Literature review

To have solid evidence for a bachelor thesis, a theoretical background must be explored and acknowledged so you have a base to source from in the follow-up practical part.

3.1 Entrepreneurship

In economic setting, Entrepreneurship can be described as engagement of economic resources and other activities to increase their base value. It is considered a dynamic process creating a value added. (Veber, 2005)

3.2 Enterprise

Enterprise can be defined as a subject where Inputs are transformed into outputs. More broadly, it is defined as an organized set of means, resources, rights, and other property values (owner or leased) used for business activities. Legally, it is interpreted as a set of tangibles and personal intangible components of a business. Things, rights, and other property values that belong to the company and serve to run the business or, due to their nature, are intended to serve this purpose. An enterprise is understood as any entity performing an economic activity, regardless of its legal form. These subjects include self-employed persons and family businesses carrying out craft or other activities and commercial companies or associations that normally carry out economic activity. (Tomšík, 2022)

Types of business entities in Czech Republic are divided into a “Natural person” and a “Legal person.” Each of these entities has different obligations under which they can operate.

3.2.1 Natural (physical) person

Entrepreneurs, employees, and consumers are three types of natural person, in this bachelor thesis we will be focusing only on entrepreneurs because they are the only type which has legal business intentions.

Sole Trader

The simplest form of business entity with the lowest initial investment cost. The entity is being run by the person establishing it without any distinction between the entity and the

physical person. There are some limitations to this type of entity and that is the guarantor of the operations profits and losses. The usual way of financing such an entity is by personal resources or by a loan.

A sole trader operates under the Act No. 455/1991 Coll., on trade business (Odbor živností a spotřebitelské legislativy, 2023)

“A trade shall mean a systematic activity carried out independently under the conditions laid down in this Act, under a person’s own name and liability, with a view to making a profit.”

In the Czech Republic there are several types of licenses for the purpose of trading based on the nature of the trade:

- Free - No special diploma or permit is needed.
- Professional – A diploma as proof of the ability to fulfil business obligations is needed.
- Concession – A special permit from the ministry which oversees certain activities is needed.

These different licenses also differentiate tax obligations for each type of business thus changing their profit possibilities. (Švarcová & kolektiv, 2016)

3.2.2 Legal person

According to the Czech Civil code, a difference between corporation, foundation, and constitution is distinguished. For this bachelor thesis, only corporations are valid on the topic. Additionally, to the Civil code corporations are in detail described in the Business Corporations Act. According to Švarcová & kolektiv (2016) the companies are further described and categorized into personal and capital.

Personal companies

Personal companies include only unlimited and limited partnership. Both types allow the partners, two or more, to split the profits, it has lower costs of running the business thanks to being limited only to the members of the company. It is even easy for one of the partners to leave the company. A great drawback is in the case of liabilities.

Unlimited partnership (v.o.š všeobecná obchodní společnost)

- Established by at least 2 or more partners;
- The liabilities are unlimited and joint;
- Profits are evenly split among the partners;
- Governing bodies can be partners individually;

Limited partnership (k.s. komanditní společnost)

- Established by two or more partners (at least one special and one general partner);
- One or more partners' liabilities are limited (limited/ special partners);
- One or more partners' liabilities are unlimited (unlimited/ general partners);
- The special partner is obliged to deposit any amount as the company's base capital;
- Profits are split in two ways for the company and general partners if not stated otherwise. The company's part is after taxes divided to the special partners evenly if not stated otherwise;
- General partners are bound to cover the loss liabilities evenly if not stated otherwise;
- The special partners are bound to participate on the covering of the loss of the company if not stated otherwise;
- Only general partners participate in the managing of the company;

Capital companies

In case of capital companies, the liabilities are limited or are non-existent, the personal managing of the company is not required to have been done by the partners, the company can be established by a single person, the creation of statutory bodies' principles is established, and the minimum initial capital deposit and the creation of reserve funds is mandatory. According to Švarcová & kolektiv (2016) these are the capital companies:

Limited liability company (společnost s ručením omezeným)

It is a type of company where initial capital is created by deposits of the partners setting up the company and where the partners' liability is limited to the amount of the initial deposit. The physical persons setting up the legal entity are separated from the entity therefore are

not in most cases responsible for the entity's downfall. If any wrongdoings of the owners that lead the company to file bankruptcy are shown the persons now become liable for their actions. This may be suitable for start-ups, which are usually high-risk high reward collecting high volumes of liquidity from investors with low possibility of return.

- Established by one or more persons;
- The minimum amount deposited is 1 Czech crown;
- The deposit can be tangible (a car, a house) evaluated by a professional;
- Bodies of an LLC
 - o Governing body - general meeting (of shareholders)
 - o Statutory body – Executive directors
 - o Control body – supervisory board (optional)
- The profits are divided based on the parts contributed into the overall initial deposit;

Joint-stock company (a.s. akciová společnost)

It is a company that is being constantly evaluated based on the value of shares. The number of shares is determined by the owners of the company and so does the initial price of them. The initial deposit must be at least 2.000.000 CZK or 80.000 EUR. The company can be established either by one legal person or two natural persons. The company is bound to the liabilities to the extent of the initial deposit.

3.3 Start-up

It is also important to define what is the actual meaning of the word start-up as many companies add it to their title without knowing what it means. According to Graham (2012) it is defined by the company's goal to achieve grandiose things in a tight framework. These grandiose things cannot be achieved through the personal financial resources of a young entrepreneur usually operating these start-ups therefore someone else needs to be backing the project. A venture capital firm, a company subsidizing these young projects with vision to then exit with higher capital than the one invested. Start-ups are all about scalability and growth to achieve high earnings as soon as possible without needing to fund the company by selling their own stock in the preliminary stages not to sell low when the

next day the company will be valued even more. To get these funding to scale, pitching an idea is a must which includes a business plan which we are going to cover soon.

“The importance of startups is remarkable for any economy investing on innovations and growth.” (Laitinen, 2017)

“The death and survival of startups are often associated with Schumpeter’s creative destruction process as startups with new ideas enter and replace old and stagnant firms” (Huynh, 2012)

“The survival rate of startups in the first five years is only about 45-55% in U.S. and Europe” (Eurostat, 2016; Laitinen, 2017; U. B. Statistics, 2016)

3.4 Entrepreneur

An entrepreneur is someone who creates a project based on an idea and tries to develop value through his actions while taking on the risks of success or failure of the project. (Veber, 2005)

There are also some characteristics an entrepreneur is supposed to have according to Veber and co.:

- The ability to manage opportunities and setting up new goals to achieve them
- Securing financial resources needed for the project
- Understanding entrepreneurship
- The ability to take risks
- Confidence, perseverance, long-term commitment, ability to learn through experience etc.

The legal definition of an entrepreneur according to Czech law deviates from this definition No. 513/1991 Coll., Commercial Code, in § 2. An entrepreneur according to this Act is:

- A person registered in the Business register (BR)
- A person who does business based on a trade license
- A person who does business based on a different than a trade license according to special regulations

- A natural person who operates agricultural production and is registered in accordance with special regulation.

3.5 Business plan

Every business needs to have goals and to do that a path needs to be followed. Having an idea about a business a person wants to start is a great beginning to an end if the person did not pave the path in advance, or at least drew the outlines of the path to get to the finish line for easier hiking. Staying in the metaphor, while the business owner paves the way, he also needs to look out for any changes, even the minor ones which in a long run can just like a root of a tree become a major problem which destroys the completed pavement. Therefore, subtle tweaks along the way are necessary to achieve the goals. This is a business plan, an outline to achieve the company's goals and mission. It is a dynamic guide helping us overcome hindrances while still knowing what we are after. The business plan is either for the company or for any external entity which requires one to, for example, evaluate the idea and the state of the art of the business. Entities such as banks, investors, venture capital firms usually require the types of guides for them to understand the business to evaluate whether it would be wise to provide financial sourcing to the company requesting the investment to grow. There are multiple guidelines on the internet for start-ups, one source of information could be from USSBA (2016).

When applying for a loan or any type of external sourcing, looking at a business plan, one must consider what it means to the one receiving it. Venture capital firms are reading hundreds of BPs and reduce it to minimum to decide which ones are worth the time, therefore the BP needs to stand out, be eye-catching to pass even through the first round as described by (Srповá et al., 2011). Providing a business plan is like providing evidence to prove what you stand for so the board can then decide whether it is feasible or not. Such a document is of a high importance because it represents the business in your absence and speaks for you.

3.5.1 Structure of a business plan

Different entities requesting a business plan have different requirements for the structure of the presented document. It can even be in the form of a presentation to better paint the

picture to sell the idea. In the case of a document there are many possibilities for how to present it for someone who has never heard of the idea that is being developed. One way to structure it is following:

- Title page
- Content
- Introduction
- Executive summary
- Business model description
- Company's mission
- Potential markets
- Competitor analysis
- Marketing and business strategy
- Finance plan
- Main prerequisites for the success and potential risks

(USSBA, 2016)

3.5.2 Title page

It is the first page of the whole document stating the name of the company, a logo, a slogan, partners linked to the company etc.

3.5.3 Content

Quick overview of what is included in the document for easy navigation.

3.5.4 Introduction

Informative text about the current state of the art of the document to not confuse the reader. Any future or current specification regarding the development stage of either the product or the document itself. For example, by handing our version 1.1. we inform the reader that a more detailed document where some elements might be edited or even added in version 1.2. This way, any reader can browse through the documentation without any hesitation and confusion on his side thanks to the informative updating.

3.5.5 Executive summary

Used in many cases as a stand-alone document, perfect executive summary can win over any request for proposal (RFP). This document is *“Describing your company’s history, your product or service, implementation schedule, and the support you’ll provide.”* (Clayton, 2003) ES needs to contain key information about the project in a particularly good descriptive and eye-catching manner.

3.5.6 Business model description

“All it really meant was how you planned to make money.” (Lewis, 2000)

A BM is the most important part of any for-profit business. It determines where the money to keep running the company comes from. Is it the selling of a single product or a fleet of products, finished or semi-finished ones? Or just raw material? Does the company offer services?

For a company like Microsoft, it was selling software for \$150 per piece with manufacturing cost per piece \$0.50. For Nokia it was a mobile phone or Meta, former Facebook connected people and with many people visiting the site, it only made sense to create commercial space for advertisement that every company nowadays uses to promote their products. (Ovans, 2015)

3.5.7 Company’s mission

A mission is the pure reason for existence for the company. It is an everlasting statement that accompanies the firm from the beginning till the end. Coca-Cola’s mission could be a fitting example: *“To refresh the world... in body, mind, and spirit.”* And so would Airbnb's: *“To create a world where anyone can belong anywhere.”*

It can also serve as an inspiration and motivation to employees and can attract customers who value a company’s approach to the world. Sometimes it can decide whether a customer orders at a company A or a company B just because of a mission it follows. A notable example of it would be that of a company called EcoLiving providing products used daily. Part of their mission states: *“At EcoLiving, our mission is to help people live sustainably and reduce their impact on the environment. We strive to create innovative products and*

services that minimize waste, conserve natural resources, and promote ecological awareness.” Such a statement may be the deciding point for someone wanting to live a sustainable life who would choose EcoLiving’s product over some other non-eco-friendly brand. (David, 1989)

By using the SMART method, we can outline goals of the company where each letter represents attributes the goals should have. Specific, measurable, achievable, realistic, and timed.

3.5.8 Potential markets

A market is a place where supply meets demand. A simple definition that explains the equilibrium, the correct price where the demand is satisfied by the right amount of supply and vice versa. The suitable market for a company is determined by a product or a service provided. It is a place where the customers looking for the product are. A person would not look for a dairy product in a hardware store. There are certainly more specifications for individual consumers’ preferences and the markets can be divided very thoroughly.

For consumer targeting, consumer markets can be segmented into demographic, geographical, behavioral, and psychographic categories. Additionally, product-centered markets are also viable to topics like industry and niche. (Goyat, 2011)

Demographical - Consumers can be sorted out by age, gender, income level, education, ethnicity, or other demographic factors.

Geographical - In many instances, products are valid only in specific regions, cities, or countries. Therefore, geographical targeting is needed for example for products such as solar panels or snowmobiles.

Behavioral - Targeting based on their buying behavior, including their purchasing frequency, brand loyalty, and product preferences.

Psychographic - Based on a lifestyle, personality, values, and beliefs.

Industry - Based on the type of industry mostly viable in B2B business. This market segment includes technology, healthcare, education etc.

Niche - A specific segment where the product is suitable only for a specific customer.

Markets can intertwine with each other to form the most specific market for customers and for the products or services there is.

3.5.9 Potential audience

Within the potential market, there are customers buying products from other companies and products the newly started company would want to match or overcome to gain a competitive advantage and to penetrate the market. It is up to the company to know who to target to sell. A company XYZ is selling pink princess toys. The most probable audience to this product would be young female aged 3 to 12 but this audience will not be the one buying this product; therefore, the company needs to target their parents and even grandparents, thus males and females aged 25 to 60. To make sure the assumption is correct a survey can be conducted.

3.5.10 Competitor analysis

Expanding on the idea of the company XYZ. There is a high probability someone else is already selling such products but if not, the company XYZ has found a gap in the market and has an overall advantage over its competitors, such phenomenon is called an economic competition and the company XZY can now skim the market until there is a company with a competing product. There are several types of competition on the market:

- **Monopoly** – A single company owns 100% of the market share, usually has a unique resource at its disposal others cannot get their hands on, which creates a barrier to entering a certain market.
- **Oligopoly** – Two companies have split the market e.g., nobody else has a certain material to produce the product to enter the market.

- **Monopolistic competition** – There are several companies fighting for the No°1 spot on the market but e.g., only two have access to a greater amount of a certain resources to expand.
- **Perfect competition** – All the companies competing have equal power over the market and have access to the same amounts and quality of a certain resource, therefore it is fair competition.

A part of a business plan is to figure out the current a probable future situation on the market to know whether the company can penetrate the market.

Porter's five forces analysis

Five forces influencing the competitive situation on the market. Each contributing to the change of strategies of the operating and soon-to-be entering companies. Each of the five forces influence the market share of every company and thus their profits. There is a

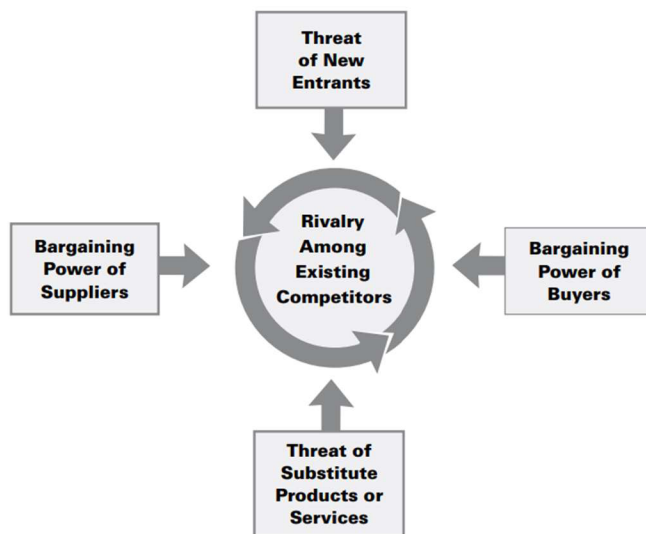


Figure 1 - Porter's five forces analysis

constant "fear" of new entrants which may capture some of the current companies by, for example, lowering their prices. A release of a product same as the competition's but introduced with a new feature that might attract new customers to the company selling it which would mean that the competitor must somehow attract the

customer base back and it may be by lowering prices and thus lowering profits. With high demand for a product, the company selling it has power over the customer by setting the price high whereas when the demand is low, the company is forced to attract more customers by lowering prices again affecting the profits. When a new entrant wants to penetrate the market, a distribution channel is needed for him to have products to sell. The

new company is either forced to buy in large quantities to keep up with the economies of scale or to buy low amounts and deal with higher prices per unit. These examples together complete a market rivalry among the competition which should be analyzed before entering any market to increase the chance of succession of any project. (Porter, 2008)

Herfindahl–Hirschman index

As a statistical measure of concentration, HHI is often used to determine how saturated a market is by taking all the firms on the market and summing up their market share squared all together giving us an estimate how occupied a market is. The HHI can range from numbers close to zero and 10 000 indicating a monopoly. Usually the number of companies included in the calculation can be limited to the significant ones e.g. top 5, 15, 30 or even top 50 to get a satisfying estimate. The formula described by Rhoades (1993).

$$HHI = \sum_{i=1}^N (MS_i)^2$$

Further more there are different levels of saturation HHI describes based on the results from the formula:

- HHI below 100 – Indicates a highly competitive market.
- HHI 100 – 1,500 – unconcentrated market
- HHI 1,500 – 2,500 – moderate concentration
- HHI above 2,500 – high concentration
- HHI 10,000 – pure monopoly

(Tomšík, 2022c; Rhoades, 1993)

3.5.11 Marketing and business strategy

Marketing mix 4Ps (7Ps)

“The combination of actions a company uses when selling a product or service. These are often described as the four Ps (= product, price, place, and promotion):

- *Their plan involves choosing target customers and designing a persuasive marketing mix to get them to buy.” (Cambridge University Press & Press)*

4Ps represent a marketing mix which helps the business to form a plan from an idea. The 4Ps contain Product, Price, Placement and Promotion. Each of these parts has a key role in selling a product or service. It is a part of a strategy to decide what to sell, at what price, where and how. (McCarthy, 1979; Andrei, 2013)

Product - Product represents the item, or a service manufactured and to be sold. It is considered the steppingstone of the marketing mix. The product itself has its features which create value for customers.

Price - Right after the product, there is price and the price range for the selling of the product has a significant importance. The markets become segregated into premium, want-to-be premium and affordable categories and it is up to the customer which of these categories provides the highest value to them. The price influences how much we sell and that brings revenue which keeps the company alive as it is the company's goal to maximize profit, sales, and wealth. The price must correspond with the company's mission, vision, costs, demand, and the competition. The price determines how the company is going to appeal to the public. The price has the highest influence over the sales volumes as it is not in most cases set and go decision, the price can fluctuate throughout the year.

When it comes to pricing strategies, multiple factors affect the way companies decide for the price level just like a summary list of strategies by Sammut-Bonnici et. al (2014).

Markup pricing

The most common strategy, choosing the price based on the cost.

Target return on investment pricing

Commonly used within companies with high initial capital investment requirements.

Perceived value pricing

Price set up based on the customer perception of the price.

Competition-based pricing

Price is relevant to the price of the competitors.

Penetration pricing

Also known as promotional pricing often utilized while entering a new market.

Skimming pricing

Taking advantage of the demand and maximizing profits by setting the price level at its highest often used within the technology markets.

Place – Often substituted with the term distribution. Place describes the distribution channels which are going to be used to sell. The company needs to decide what fits the customer best, where the product is going to be found by the potential customer. An important fact to know is who is the customer to target to find more easily the correct distribution channel the company is going to be using.

Promotion – The way to let the world know about the product. It is a way to communicate with the customers without ever meeting them. Thanks to already known practices and technological tools, we can specifically target customers based on the data including their characteristics. Basic communication channel is advertisement through a tool called Facebook Ads which lets the company create an already identified profile of a customer to target.

Additionally in modern marketing methods, 7 or more Ps can be used. (Jain, 2013)

Personnel – Providing necessary advice by personnel to shoppers, embracing employees' enthusiasm to respond to members' questions and employees' courtesy.

Procedure management – Utilization of self-services, resolving shoppers' problems during shopping, considering the importance of shoppers' time, and categorizing products based on member's convenience.

Physical assets – The decoration of the cooperative, proper amenities like refrigerator and electronic scale, physical facilities like wheeled baskets, calm and enjoyable ambience of the cooperative.

PESTLE Analysis

A tool used in the evaluation of externalities on the current market. This analysis is always situational and flexible as many conditions around us are constantly changing. The externalities PESTLE analysis focuses on are to the company uncontrollable and cannot be change making the company adapt to the situation creating a mobile environment and it is up to the company to become as stable as possible and preferably to benefit from these changes. (Perera, 2017) The key environments of the PESTLE analysis which the company needs to evaluate include:

Political Env. – Political (in)stability, changes in political constitutions, changes in policies, acts of the governments etc. Political environment plays a significant role in the business' possible success as the government can restrict some activities which influence the company's profits. The political situation is proportionate to the risk possible instability may create.

Economical Env. – Age structure, income levels, unemployment rates, gender distribution, inflation rates, tax rates, educational levels etc. all paint the picture of the region the company may become established in. The painted picture then indirectly predicts the company's success but at the same time lets opportunities arise in the specific region. The company, after evaluating the economic environment, can decide whether the situation is beneficial or not. 50 years ago, Dubai was a desert with no particular use, but the idea has been moved into process and now skyscrapers surround the coastline accommodating more people than anyone could have ever imagined.

Socio-cultural Env. – Traditions, cultural aspects, norms, myths, religious values, religious beliefs, ethical values, perceptions and attitudes towards business and industry fall into this category. Without respect and adaptation to these values within the region, there is a low to zero chance of success.

Technological Env. – Technical upgrades, technical infrastructure, technical competency, productivity of technology, updates, hardware, and software etc. are aspects that not only companies with technological aim must take into consideration. In the current era of ever-changing technology, the region's advancement cannot be taken for granted. Many things can work in Europe that cannot exist in other parts of the world as the lack of infrastructure to supply the technology is not there.

Legal Env. – The laws, regulations, principles, guidelines, and Acts form a legal environment in which the company operates. Each region has its own set of factors which need to be considered when deciding. These factors also differentiate industry to industry according to which there are specific factors focused e.g., on building, on farming or on gastronomy and Food Related Laws and Regulations.

Ecological Env. – Hot topic for the past few decades, the importance of ecological or natural concerns in business is critical with the increasing pressures and sustainability concerns. Putting stress on the planet-healthy environment we live in to decrease worldwide pollution. This environment focuses on redesigning the polluting processes to non-harming e.g., use of energy efficient, eco-friendly methods of production while reducing cost.

3.5.12 Project realization plan

A particularly crucial step while creating a business plan is to outline a time itinerary. (Srповá, 2011) By creating one, the business has certain goals and milestones to go after and checks them out one by one. After a while, the accomplished goals create a reference point for future projects, risk evaluation and process optimization.

Forming an actual plan from an idea. Executing smaller tasks to create the bigger picture. The correct methodology can be a key aspect to the success of a project. There are two popular methods each focusing on a different type of project, an agile method as a test-driven method and a waterfall method as a plan-driven method. (Thesing, 2021)

- **Agile method** emphasizes an ever-changing progress due to uncertainty and stakeholders' requirements. It is a versatile approach which enables the project team to adapt to even the most recent changes quickly and effectively. It is

often used in software development as it encompasses different tasks of the project which can be worked on separately, contributing to the big picture at the end of the development session. It also emphasizes constant collaboration between team members. This method is not necessarily limited to the “sprint” type development but also takes advantage of different methods like Scrum and Kanban, each suitable in various parts of a project.

- **The Waterfall method** is a project management guide to continuous progress from start to finish with tasks enabling another set of tasks in a linear way. It is often used in situations and projects where the tasks can be hardly divided into small ones that can be executed independently due to, for example, security risks or continuity.

Thesing et. al produced an approach to correctly select the aforementioned methodology to best fit the project.

“A project is not suitable for agile methods if the following project properties apply”:

- *Lack of decomposability of the overall result into separate deliverables.*
- *One-shot game: Frequent changes or a step-by-step, iterative approach to the solution are not possible from a legal or technical point of view or are associated with unreasonable costs. Examples include the construction of a house (adding a cellar in an ongoing project after the first two floors have already been built) or the geographical relocation of a production facility.*
- *Criticality of the project: Operational risks prevent an iterative, agile approach. Examples include solutions in the field of process control or real-time applications and safety-critical systems.”*

“If one or more of the exclusion criteria mentioned above apply, project success with agile methods is unlikely. Thus, a classical waterfall approach is recommended, and the decision process will be abandoned. However, even with a waterfall approach, individual sub-modules may well be suitable for agile methods.” (Thesing, 2021)

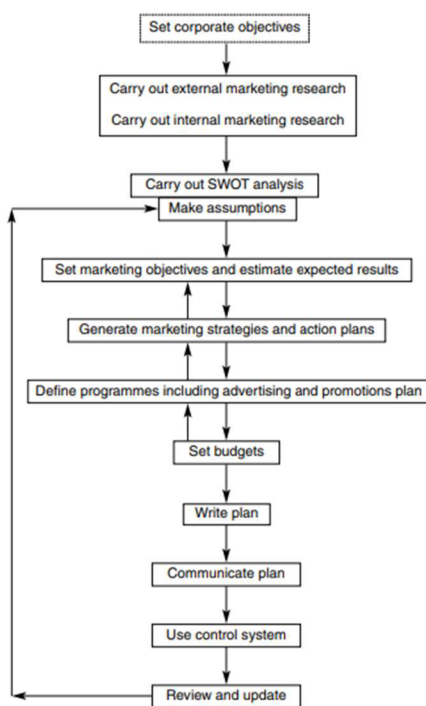
Manufacturing & trade plan

A plan that describes the way a product or a service is being produced. Summarizing a list of manufacturers and suppliers for further evaluation of the plan is needed as the risk which arises from the small number of suppliers can reach significant heights. The manufacturing costs influence the profits, and it is up to the company to negotiate and accept the price according to the available resources and according to the plan.

The planning involves the amounts to be produced which encompasses the amount of input used. The cost can be then allocated based on the nature of it, either as a direct cost amounting to the cost per unit or an indirect cost allocated to a cost pool which can be then divided by the number of units to account for an indirect cost per unit produced. (Tomšík, 2022)

Marketing plan

“Applying marketing resources to achieve marketing objectives. Marketing planning is used to segment markets, identify market position, forecast market size, and to plan viable market share within each market segment.” (Westwood, 2013) This process involves:



- Carrying out marketing research within and outside the company
- Looking at the company's strengths and weaknesses
- Making assumptions
- Forecasting
- Setting marketing objectives
- Generating marketing strategies
- Defining programmes
- Setting budgets
- Reviewing the results and revising the objectives, strategies, or programmes

(Westwood, 2013)

Figure 2 - The marketing planning process (Westwood, 2013)

The sole purpose of marketing is to present a product to a potential customer. There are multiple channels allowing companies to share their products with the people the company's strategy is targeting. According to Srpová et al. (2011), there are multiple of them:

- Advertisement on television, websites, newspaper, or billboards
- Direct marketing through emailing, SMS, and MMS
- Personal selling at fairs or door-to-door
- Sales support by providing samples, coupons, or rewards
- Public relationships (performance, conventions, and TV)

(Srpová et al., 2011)

Organizational plan

By the organizational plan, the author means the organization's structure, the main entities within the company dealing with certain tasks to be determined after establishing the company.

Financial plan

The financial plan transforms the previously stated plans into numbers to determine the project's feasibility. (Srpová, 2011)

Sources of financing

To support the company's mission, capital to operate on the market is needed. According to the summary made by doc. Ing. Karel Tomšík (2022) There are multiple options:

- **Internal sources**

Capital emerging within the company alone to support the business activities.

- Internal equity financing

As a regular most obvious type of financing that covers the business activities are retained earnings, asset redeployment, depreciation which are the base of any company.

- Internal debt financing

So-called accrued liabilities are the regular day-to-day debt a company creates simply by employing a person that receives the monthly salary after fulfilling the job stated in the contract.

- **External sources**

Capital emerging from outside of the company to support the business activities.

- External equity financing

As the most usual source of external financing the personal resources, sale of share, angel investor, venture capital firm, subsidies are the initial options to start a business with capital.

- External debt financing

Another liability options for financing are a trade credit, lease, sale-and-leaseback, bank overdraft, term loan, factoring, bill of exchange usually providing liquidity for a certain time in exchange for interest.

Revenue and expenses projection

Statements

According to Stárová (2019), financial statements summarize entity activities over a period. These reports are standardized and provide performance and status of the entity reviews. The following financial statements are issued at least annually as they summarize the previous year.

- **Balance sheet (Statement of financial position)**

The purpose of the statement of financial position is to set out the financial position of the business at a chosen point in time. (Marriott, 2001) The balance sheet additionally reports the business' economic resources known as assets and compares them to the sum of equity and liability and the investing and financing amounts.

- **Income statement (Statement of profit or loss)**

Everybody wants to know how the business is doing, how much profit it made or what loss it suffered. (Tracy, 2014) The income statement summarizes sales revenue and expenses for one year.

- **Cash-flow statement**

The cash flow statement is a financial report that describes the source of a company's cash and how it was spent over a specified period of time. (doc. Ing. Karel Tomšík, 2022) The cash flow reported in the Statement of Cash Flow consists of 3 components:

- operating cash flow (internal)
- investing cash flow (internal)
- financing cash flow (external)

Business ratios

Tomšík (2022) in his lectures and seminars at CULS in Prague summarized different formulas which are being used on the daily basis by most businesses.

ROE – Return on equity

Measurement of efficiency of the ability of the firm to generate profits and grow the firm with a use of money from owners.

$$ROE(net) = \frac{Net\ profit}{Total\ equity}$$

$$ROE(gross) = \frac{EBT}{Total\ equity}$$

ROA – Return on assets

How efficiently can a company earn a return on its investment in assets.

$$ROA (net) = \frac{Net\ profit}{Total\ assets}$$

$$ROA (gross) = \frac{EBIT}{Total\ assets}$$

ROS – Return on sales

How effective is the company at cost control.

$$ROS = \frac{Net\ profit}{Total\ sales}$$

ARR – Average rate of return

Measurement of average interest of a project.

$$ARR = \frac{Average\ annual\ profit}{Capital\ lost}$$

BEP - Break-even point

It measures the company's point where the revenue turns to generating profit.

$$BEP = \frac{Fixed\ cost}{Contribution\ margin}$$

3.6 SWOT analysis

A business strategy tool helping to compare the company's idea with the competitors on the market. The author of the analysis remains debatable and cannot be directly cited. The analysis considers both internalities and externalities to the company, and it does that by asking different but related questions to each of the analysis factors. (Teoli D, 2022) These factors and the questions are:

Strengths - What are the organization's advantages? What can you do better than others? What unique or lowest-cost services can you provide patients? What do patients in your market see as your organization's strength?

Weaknesses - Upon what factors could the organization improve? What are patients in your market likely to see as your organization's weakness? What lack of services loses your organization patients?

Opportunities - What good opportunities are available to your organization? What are the new and exciting trends your organization can try? What recent changes to governmental regulation/policy can benefit your organization?

Threats - What problems does your organization face? Of what are your organization's competitors taking advantage? Do evolving technologies and new services threatening your organization's position in the minds of patients? Does your facility have cash-flow problems? Could any of your weaknesses threaten quality patient care?

4 Practical part

This upcoming part of the paper may serve as an individual document for business purposes as it is structured accordingly.

4.1 Business plan

Project's name:	GreenPanels
Date of origin:	January 2023
Company's name:	GreenPanels s.r.o.
Type of business entity:	LLC
Company's adress:	Do Dubin 249/6 Praha 4 - Kunratice 148 00
Established in:	Prague, Czech Republic
Responsible person:	Danny Višvader
RP's phone number:	+420 775 655 582
RP's adress:	Do Dubin 249/6 Praha 4 - Kunratice 148 00
RP's email adress:	d.visvader.visv@gmail.com

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4.2 Introduction

Dear reader,

This document has been developed as a practical part of a bachelor thesis to work out a business plan of a project called GreenPanels which is going to be further described in the next part of this document. This is the 1st version of this document of the idea currently in an ideation stage. Also, this document might serve as a tool to obtain much needed investments according to the financial analysis determining the project's feasibility.

4.3 Business description

The subject of this business plan would be a in the future established company GreenPanels s.r.o. developing a new innovative products in a field of agriculture called GreenPanels and an app called MyGarden complementing the GreenPanels systems.

4.3.1 GreenPanel

GreenPanel is a semi-self-sufficient irrigation panel capable of watering a plant without any assistance based on an app where a user would choose the frequency of the irrigation. The only things it needs is nutritious water and a plant e.g., salad, cherry tomatoes, kale or other leafy vegetables and many more. The GreenPanel as a single unit is prototyped to be 12 by 12 by 4 centimeters big and can be expanded by another Panel to all its sides (*see Figure 4 & 5*). The custom sized device can be then installed onto a wall or to a purchased stand to function as a vertical garden to grow plants 365 days a year with very low water waste and easy soilless management. This system can be considered aeroponic since the irrigation is splashed-or-spray-based which allows the air easy access to the plant's roots. The system isn't strictly limited to aeroponics but could be possibly used as an automated irrigation system to conventional growing with soil. There is also a plan for expansion to a software environment via an app (*see Figure 5*) which would help managing each crop using statistics and sensor measurement through hardware installed in each panel. For example, a person who has never farmed before might use a potential function of vegetable presets as a simple "plug-and-go" solution, where each preset would be setup for a certain plant in general e.g., a lettuce would need a lot of water or nutrients therefore the irrigation would be more frequent than to a house plant. Additionally, to increase yield, LED lights to

support growth could be added to tackle the indoor lack of light or to manage weather condition a plastic see-through cover could protect the plant from insects and unpleasant weather and to create a greenhouse effect.

Concept and prototypes of GreenPanels

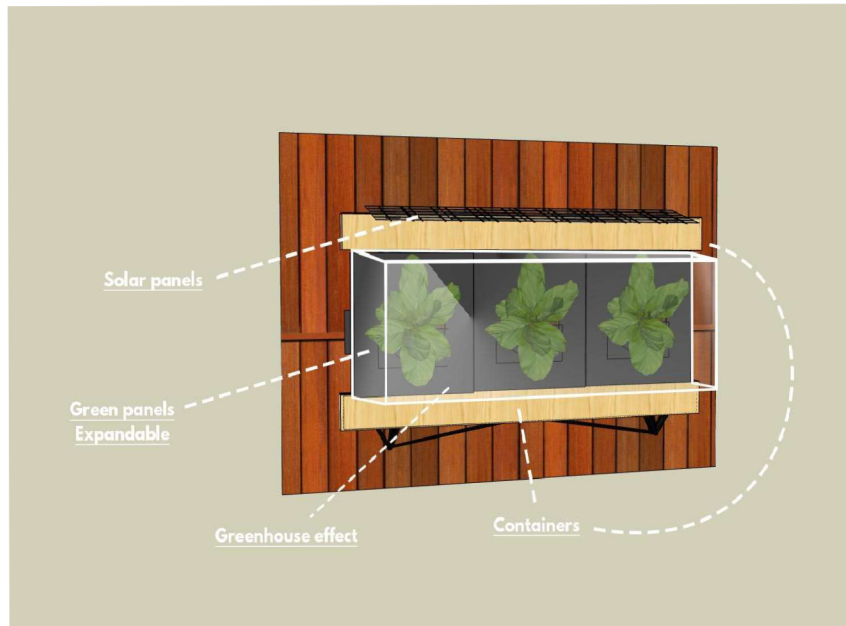


Figure 3 - GreenPanels initial 3x1 concept (Source: Author)

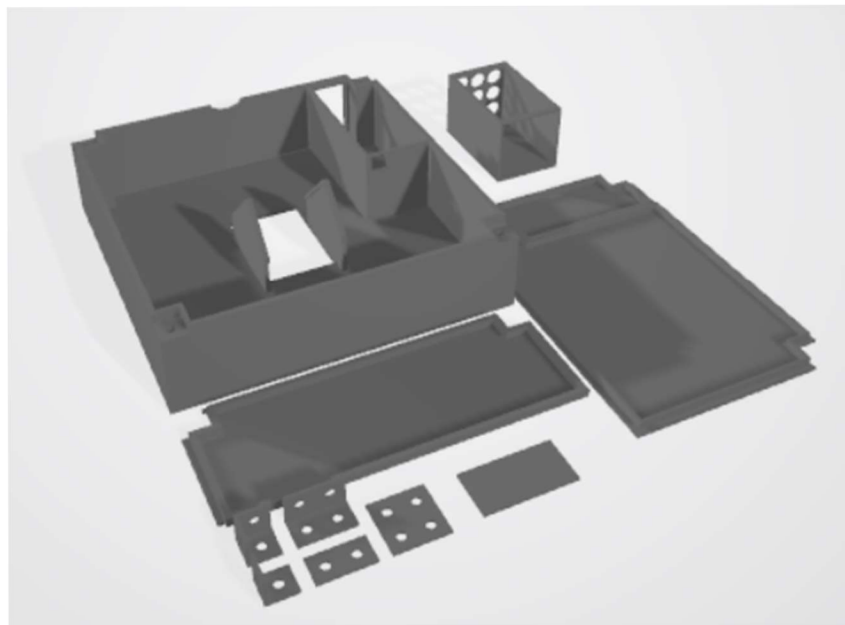


Figure 4 - 3D Prototype Model (Source: Author)

4.3.2 MyGarden App

The other aspect of the company is a software environment as a support to the GreenPanels product. The app is idealized as a learning platform for people who want to learn how to take care of any plant or produce in their home garden or specifically in the GreenPanels vertical garden.

The service is based on Freemium model where some basic features are being offered but if somebody would want to gain extra added value provided by the company, they could expand to the premium environment of the app.

The purpose of the app is to create a community of home gardeners at one place which would grow into potential source of customers for GreenPanels.

The MyGarden app would act as a learning platform, social media, and crop manager at the same time. Different features would be included based on the value they provide.

Concept of the MyGarden App

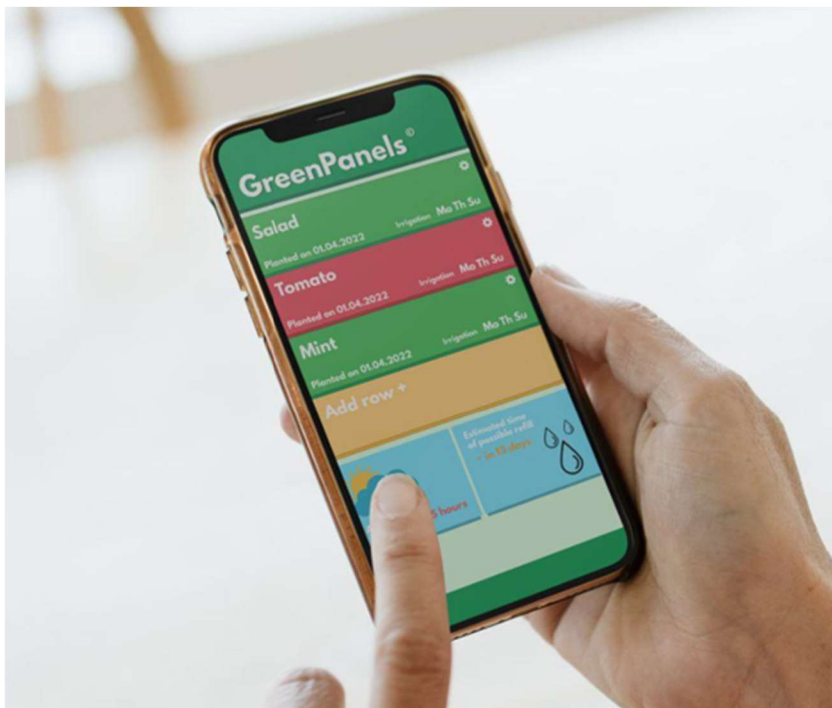


Figure 5 – GreenPanels (MyGarden) App concept (Source: Author)

Free environment

As stated before, the app is there to help people to get to know the process of growing their own plants or produce. The full growth is not always certain for plants as they can always get affected by their environment, but the app makes sure the customer gets all the knowledge to properly execute the task throughout a learning path with descriptions and pictures on how to properly do it in the simplest way possible.

The free app would include the learning paths of diverse types of plants, plant diary and friends growing and plant calendar.

Premium environment

The purchase and the follow-up connection to the GreenPanels products enables the one locked part of the app where a person can manage each crop by setting up the frequency of watering manually or by choosing from the presets based on the general plant characteristics e.g. If the user plants a salad, the preset called “salad” waters the unit every hour for 10 seconds.

The app also always collects data to give accurate predictions of watering requirements and plant’s needs. The data are collected by the sensor modules included in the GreenPanel monitoring temperature, air quality, amount of sun, water level etc.

On top of that the app itself would include light monitoring feature to figure out the best place for the panels, creation of timelapses after the full growth of the plant, plant issue diagnosis, push notifications with reminders and notifications and a crop manager.

The revenue model is not yet decided but the owner has two options, subscription-based model, or a main product purchase, where once the customer buys a unit of the GreenPanels, he gains access to the locked environment.

4.4 Executive summary

The subject of the business plan is a not-yet-set-up limited liability company operating in Prague, Czech Republic. The name of the company is GreenPanels s.r.o. selling an

innovative product across the globe. The product is a GreenPanel, an aeroponic or conventional vertical garden with automated watering set up through a learning freemium MyGarden app teaching people basics of farming through step-by-step instructions and sending notifications based on the data provided by the sensor modules in each GreenPanel. The main revenue stream is planned to be the sales of physical products but the not-yet-decided premium part of the app might become significant revenue stream as well.

Raising awareness comes from the press, emailing, social media campaigns and social media like Instagram, Facebook, and Pinterest. The main customer acquisition comes from the downloads of the free MyGarden app which allows conversion from users to customers thanks to the features it provides and simple user interface.

Push notifications linked to the GreenPanels will remind the customer to take care of the plants. Just like the popular language learning app Duolingo, MyGarden might include streaks to make people learn more about plants and expand their growing portfolio. Within the app through streaks and referrals, the customer receives discount codes for a purchase of a new product or any accessories to keep the motivated to stay on the app.

The success of the project can be measured through the number of downloads, plants registered, learning path progress of the users, premiums unlocked, units purchased and other product purchases.

The owner seeks an investment of 559 500 CZK to fuel the development for the next 3 years before the revenue stream sets off.

The owner also seeks a software developer and a hardware developer to lower the risk and increase the chances of success of the project.

4.5 The business model

The business model would operate in three layers. The first layer is to be the main product, the GreenPanel and the premium of the MyGarden app. Second layer are secondary products as substitutes to the main product, conventional self-irrigating pots and plug and go irrigation systems also compatible with the app. The third layer are supplement or supportive products, LED lights, frames for climbing plants, greenhouse covers, plant baskets with and without mesh or a solid-particles filter, nutrition tonics, seeds, tools, connections between panels, attachments to walls, windows, and frames creating a stand-alone vertical garden. All together providing a wide portfolio of products with many other opportunities for widening the range. In order to acquire customers, the app would serve as a source of potential customers.

4.6 Company's mission

“Learn and grow,” “Home-alone Garden,” “Eat YOUR food,” “Clean way to farm at home” or “Home-grown tastes better” mottos well define the company's mission.

The GreenPanels s.r.o.'s purpose of existence is to teach the population to grow their own food, to eat healthily, to popularize home farming in the urban areas and to create a valid solution to water scarcity in some countries.

The company is supposed to be a modern, designer, and minimalistic representation of what farming is. The brand presents itself as high-end for a reasonable price.

The financial goal of the company is to gain enough financing, to sell enough to sustain costs, grow a community and all that within 5 years of the start of the development. Within 5 years of existence, the company will:

- Be established in at least 4 European markets.
- Increase its value above the initial investment at least 5 times.
- Become the standard in the home gardening industry.

4.7 Potential markets and audience

With a wider range of products comes the opportunity to generate higher revenues. With one product serving one purpose, there is low chance of success in penetrating a market. On these markets, other companies present their products like yours and it is mostly up to the usefulness of the product to capture as much of the potential cut as possible. For GreenPanels, the obvious industry is agriculture, more specifically, the market GreenPanels are to be sold at is home gardening which could be specified even more to innovative gardening products. Such a category could be considered a niche in which when competing with other companies, there is a low potential to capture for-growth-profitable slice of the pie.

When considered a vertical garden, a broader concept, the potential area of use of the product is very wide. The GreenPanels and vertical gardens create multiple benefits such as providing produce, being aesthetically valuable and being beneficial to mental health.

4.7.1 Urban Environment

Main market GreenPanels aim for is the urban environment of individuals where there is little to no space to garden conventionally meaning there is a possibility to use vertical garden as it takes up little space along the wall. Balconies, rooftops, apartments without balconies and public spaces such as shopping malls.

Other potential markets are:

4.7.2 Restaurants

Taking on a green trend of designing their venues with a hint of nature. With vertical gardens, this satisfies the trend as well as providing them with fresh produce, benefiting their cuisine and thus their reputation by using fresh ingredients.

4.7.3 Offices

Possibly benefiting from vertical gardens by improving many constraints of a working environment such as the looks of the area and air quality.

4.7.4 Universities, schools, and retail spaces

Also, viable options as potential markets are educational institutions and environment for the free time of the public.

As stated before, GreenPanels should serve individuals in urban areas to develop their knowledge in growing their own fresh produce to develop a culture of urban agriculture in every home. The specifications of a singled-out person who would be interested in the product are tech-savvy, living a healthy lifestyle by exercising or by eating healthy and have higher level of income of 40 000 CZK and more which is only based upon assumptions.

4.7.5 Targeted customer characteristics

Young person in their twenties

A person around 22 to 25 years old interested in learning to grow or plants in general with the use of modern technology as a new innovative way of growing products.

Middle-aged millennial

A person with loads of work on his shoulders to which the automated system would help keep his plants alive.

Millennial parent

A person in a relationship having a child of approx. 8 years who is eager to take on a new skill.

4.8 Market size

The size of the market is a rough estimation since there is not any data regarding the perception of aeroponics or a smart watering system, therefore the following research is extremely limited and should not be considered valid to the financial analysis.

Research has been conducted in the capital of the Czech Republic, Prague through collected data from Google Maps as a secondary source of data.

4.8.1 Assumptions

People who have “Green Balconies” (see Figure 6), balconies with flowers or flowerpots visible from the Street view in Google Maps can be considered potential target audience to our product.

- Every third flat has a balcony (SReality.cz, 2023)
- There are on average 2 people per flat in Prague. (CZSO, 2021)
- 627 705 apartments in Prague are usually occupied. (CZSO, 2021)

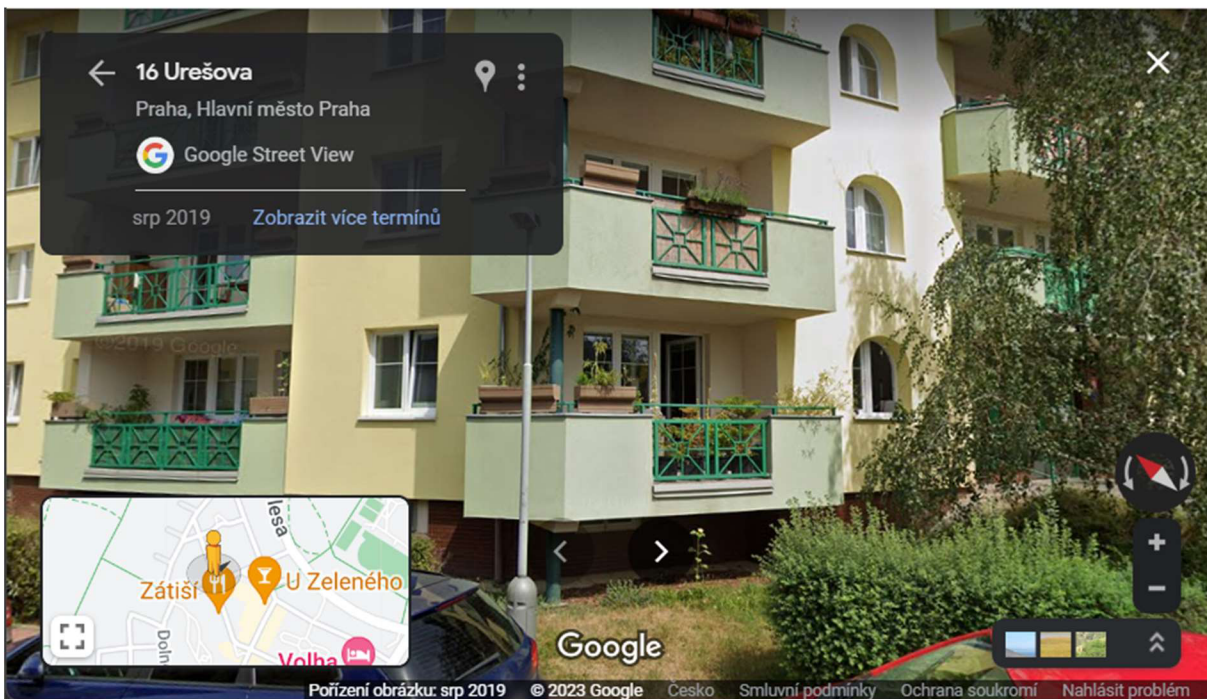


Figure 6- "Green-balcony" in Prague, Urešova street. Source: Google, 2019.

4.8.2 Market size calculations

Total number of occupied apartments (CZSO, 2021)	627705
Total number of apartments offered (SReality.cz, 2023)	5860
Number of apartments with a balcony offered (SReality.cz, 2023)	1748
Ratio of apartments with balconies (Source: Author)	0,298294 (rounded up to 1/3)
Estimated number of apartments with balconies	209235
Total estimated number of people accommodated in an apartment with a balcony	418470
Total estimated number of people accommodated in an apartment with a "Green Balcony"	121356,3

Table 1- Market size calculation (Source: Author)

The area of focus were streets of south-western Prague in three different suburbs, Praha-Chodov, Praha- Jižní Město, Praha- Modřany. In total 12 streets were roamed through in the digital environment spotting 38 residential buildings with total 1 177 balconies out of which 336 of them were in accordance with the assumption. Then the total number of usually occupied residential buildings 627 705 (CZSO, 2021) were divided by the sample rate of present greenery on a balcony to the total number of balconies spotted equaling to 29% and when multiplied by the 2, the average number of people occupying apartments in Prague (CZSO, 2021).

Amounting to 121 356 finally giving us the very rough estimate of the number of people the company wants to target.

4.9 Market trends

4.9.1 Water Scarcity

In many southern countries in Europe and other very dry and hot parts of the world currently face water scarcity which denies a lot of attempts for conventional growing. By deploying GreenPanels which should theoretically save much more water than any conservative approach, facing such difficult environmental problems could be much easier.

4.9.2 3rd agricultural revolution

Previous agricultural revolutions were not any different from what is supposed to come next in just a few decades. Innovative ways of producing way with more efficient method increasing the overall yields. “Water-farming” could, thanks to the year-round growth, potentially increase annual yields entering the 3rd Agri-revolution.

4.9.3 Continuing urbanization and rise of megacities

Just like Hong-Kong facing the problem of lack of space, many cities are going to soon be facing the same problem. In places where the space constraint limits conventional farming, with the space utilization of a GreenPanel, people could grow their own vegetables even in places where it is not possible in any other way.

4.9.4 Lifelong Health Journey

With the stress that is being put on the health of individuals, the trend of healthy lifestyle gains on magnitude. GreenPanels help growing fresh produce without any use of herbicides or pesticides providing clean and healthy way to a daily catering.

4.9.5 Neo-ecology

Reinventing the wheel is not necessary but reinventing the population’s approach to the planet’s health is. Finding a more sustainable way to everything is what the term encompasses. A notable example would be the use of a plastic bag which has been “reinvented” to the use of paper bags. GreenPanels are reinventing the way of growing produce by using less amounts of water more efficiently than conventional farming.

4.9.6 Rise of the Silver society

The population's age is increasing and people with knowledge of technology are getting older as well which creates a technologically knowledgeable elderly more competent with the use of new innovations. This fact affects the way elderly customers are looked at from a marketing point of view. Companies could put less effort and cost into fool-proofing their technology as the elderly would be already familiar with current technologies.

4.9.7 Minimalism and indoor greenery

GreenPanels purpose is not only to grow vegetables but also to create a pleasant environment through the growth of greenery. The design side of GreenPanels is very minimalistic, modern, and clean so it can fit into any environment.

4.9.8 Artificial Intelligence

With the use of artificial technology, the software side of GreenPanels, the app, could from the collected data evaluate the current state of a plant and recommend the user possible steps for either recovery or simply next basic steps to follow in the "growing guide" which would teach the user how to take care of plants.

4.9.9 Hyper-connectivity and hyper-automation

People becoming increasingly attached to technology raises new topics like interconnectivity of technological ecosystems and automation of basic processes. GreenPanels is just that. It automates the process of watering the plant and interconnects each GreenPanels with the app to allow the user to manage his crop.

4.10 Competition Analysis within the Czech Republic

There are multiple comparable products on the market but none of them fully fulfill the function of GreenPanels. Nevertheless, there are many substitutes in the field of home gardening which compete with the company's solution. Price, quality, durability, design, and function are the main aspects of a product. Here is a list of competitors with a detailed description of their product.

4.10.1 Ikea self-watering pot

IKEA is a home furnishings company founded in Sweden operating around the world. Just like furniture, IKEA offers many home gardening products like pots. The closest substitute excluding regular pots, IKEA provides self-watering pots. A regular pot with an additional compartment below which when filled up with water transfers water into the soil above through a textile knot. This product is the simplest self-watering technique. The price of 549 for a pot seems higher. In comparison to GP, it does not contain any technical advancements, cannot be expandible due to its shape and the use of conventional home gardening. (IKEA, nedatováno)

4.10.2 Gardena automatic irrigation system

German based company with deep history Gardena focuses on outdoor gardening through tools, pumps, and overall irrigation systems. One of their series is called SMART system with an app included and it is similar to what GreenPanels app and secondary products might do. However, Gardena offers automatic irrigation systems. Their solution aims at outdoor growing where the process starts by automatically opening a valve allowing the water to flow to water the plants through a system of tubes. (Gardena, nedatováno)

In comparison to GreenPanels, their solution does not allow indoor watering and does not include any pot.

4.10.3 PARKSIDE® Dovolenský zavlažovací system

Parkside, a brand created by LIDL, a grocery store chain which expanded into many other markets in the last decade, one of the markets is home gardening including many products substituting the GreenPanels.

As stated in the product description, the product serves as a vacation assistant with programmable irrigation of indoor and even outdoor plants with programmable options to manage the amount of water flowing out of the not-included reservoir to supply the plant's requirements. The device could be considered a programmable pump. This product is one of the closest substitutes to GreenPanels on the market as the features include managing the amounts of water, managing the frequency of the irrigation, and using a motor to supply the water. (LIDL, nedatováno)

The design of the product is meant to serve its purpose in the absence of the owner; therefore, it is not suitable for daily use due to its looks and dimensions. The price of 999 CZK is appropriate to the purpose and according to the website is considered “TOP” within the company’s fleet of products which could indicate a demand for the product.

This product in comparison provides automatic irrigation just like GreenPanels but is not in a direct contact with a plant, it is a supplement to another product which people may put away for some time and forget about it as it does not continuously serve a higher purpose.

4.10.4 Herbafabrica

An urban farming company producing so-called micro greens and supplying local cafés and restaurants in Prague. The company is supported by the subsidiary EU bill GreenPanels wants to get support from too. Their innovative approach for producing its micro greens is not anywhere specified but according to their website, by analyzing the statement that their approach saves at least 95% of the water used implies that hydroponics, aeroponics or aquaponics method may have been deployed. For pricing, a quotation must be requested through an email. (Herbafabrica, nedatováno)

4.10.5 Albert Hydroponics

As described in the article published on the company’s website, the grocery store chain launched its own hydroponics solution within their stores allowing people to choose fresh produce right from their farm. Albert does not provide any solution but the produce itself therefore is to be eliminated from the direct competition.

Conclusion of the competitor analysis in the Czech Republic is the fact that there are no direct substitutes and competitors to the GreenPanels but due to many ways of growing indoor plants and produce, the number of indirect competitors delivering products like pots, automated watering and the produce alone is high, the market is therefore highly saturated and should be kept under the radar. (Albert, nedatováno)

4.11 Marketing Analysis

Marketing mix has been deployed to further describe the techniques in each marketing mix category within the industry and the market.

4.11.1 Marketing mix

Product

The main product is a GreenPanels alone. Secondary products include accessories. The secondary product fleet include LED lights, frames for climbing plants, greenhouse covers, plant baskets with and without a mesh or a solid-particles filter, nutrition tonics, seeds, tools, connections between panels, attachments to walls, windows, and frames creating a stand-alone vertical garden.

Additionally, an installation service can be provided if bigger quantities of panels are purchased.

Once the product is developed, marketing strategies can be deployed, and the product can be sold through the distribution channels further described.

Price

599 CZK is the price per single standalone unit including packaging. It is based on the markup pricing strategy which is oriented based on the cost of the manufacturing.

The price of one GreenPanels is derived from the estimated manufacturing cost which includes the purchased components and manufactured skeleton of the panel which is initially 3D printed as a prototype and later in the process purchased as a manufactured unit through injection molding made by an independent manufacturer.

Unit price break-down analysis:

- Plastic skeleton from food grade plastic (Alibaba.com; n.d.) – 40 CZK
- Components (Aliexpress.com; n.d.) – 240 CZK
 - DC Water pump 3-6V – 30 CZK
 - Wi-Fi + Bluetooth module – 50 CZK
 - Electronic interconnections – 5 CZK
 - Operating unit (Prototyped on Arduino clone) – 90 CZK
 - Power supply – 60 CZK
 - Water tube – 5 CZK
- Packaging (TopObaly.cz; n.d.) – 10 CZK

Total cost of 1 unit excluding overheads totals 290 CZK per unit.

It is important to specify that these prices are not from bulk but for personal purchases.

Next pricing strategy is to create a “starter-pack” bringing people more value as a set of 3 GreenPanels with included accessories such as nutritious blends, mediums for the seedlings, seeds, cleaning stick and a power supply. This starter pack’s price would be set to 1499 CZK.

Place

The company would operate in the internet environment, forming an e-commerce shop. The second distribution channel would be hardware stores like OBI, Hornbach and Bauhaus, which would also help the company with an easier transition to international markets.

Promotion

Deploying advertisement campaigns through e-commerce tools Google Ads, Facebook Ads and SKlik to target customers with attributes specified in the target audience to find the right lead also known as the customer who would be interested in the product the company offers.

The company should participate in fair pitching, proving the product delivers all the promises and to subsequently sell.

To support the sales to the final customer, the customer would receive a discount if they were already a user of the GreenPanels app, which helps the customer take care of the plants without needing the GreenPanels.

To support the idea of sustainability and to win customers over, the company could launch a campaign where it would for example plant a tree per panel sold or support a charity of choice.

The GreenPanels would be active on social platforms like Instagram, Facebook, and LinkedIn to provide customers with insight of progress, innovation, and the company itself.

The app currency - To acquire new users, the current users can take advantage of the referral system in the app by recruiting their social circle by sharing their referral code to receive an app currency to purchase discount codes which the user can use to purchase other products.

To retain customers the app encourages the users to take daily photos of their plants to keep them on the platform as a routine. Daily photo-taking of their plants extends a streak for which the user receives the in-app currency at a reasonable rate.

4.11.2 PEST(LE) Analysis

Political – The current state of politics is leaned towards the support of ecology on every front; therefore, GreenPanels would certainly benefit from any European Union and domestic acts regarding this topic. One of EU's priorities is to lead the member countries towards sustainable and greener environment, and it does it through releasing of new policies. (Union, nedatováno)

Unfortunately, the current conflict between Ukraine and Russia has affected the European market influencing the purchase power and therefore even the willingness to buy.

Economical – Czech Republic is currently facing high energy prices and hyperinflation at 19.2%. Activity on the markets is assumed to be held back in 2023 by high energy prices

and continued high uncertainty. (OECD, 2022) Such an evaluation of the current situation is not favorable to the business idea.

Socio-cultural – People in the Czech Republic have always grown plants indoor and produce outdoors. The culture has shifted by the rise of a new generation which is more in contact with technology than with nature. As the current trend signifies, the position of the culture among the younger generations puts stress on the importance of healthy lifestyle which favors the presented business idea.

Technological – The technology to develop the GreenPanels and the GreenPanels app is currently available making the idea virtually feasible. With the rise of the silver generation, people are more familiar with the processes and how things work therefore it is doable from the technological point of view.

Legal – After switching to our own manufacturing, a permit will be required for the creation of a nutrition blend. Also, while outsourcing the manufacturing to a different country, the supply chain might get interrupted by any legal changes in the foreign country.

Ecological - The requirements for the sustainable future proposed by the European Union support the product, therefore no entry barrier is set up. The environmental trends go hand in hand with the company's mission to the sustainable future.

4.12 Project realization plan

4.12.1 Development & manufacturing plan

The main method for the development of GreenPanels cannot be singled-out as the development takes place in multiple environments:

Hardware – For HW development of the GreenPanels, the waterfall method is going to be used as the project needs to be sequentially created. For example, the testing cannot be done before the manufacturing of a prototype has been finished whereas in software, the testing of the environment takes place throughout the entire process.

Software – As often used in SW development, the agile method is going to be deployed as it provides quick milestones building up the environment from scratch. Also

complementing methods like Kanban can be used as well as it helps organizing different tasks and their due dates clearly for each team member.

First prototyping and prototype testing is needed, once the company considers the model functional, then the process can move to beta testing by real potential customers in exchange for feedback on the setup, the growing and the entire process.

Once the beta testing is finished, based on the feedback, further evaluation of the following manufacturing plan can be developed.

As the market size is not known the number of products to be manufactured is difficult to estimate, further research would be needed.

The assumed time to move into manufacturing the 1st units for beta testing is 4 months. After collecting feedback which might happen simultaneously with the testing, the team can fix flaws and improve the product to move into 2nd round testing and repeating the process with the 3rd round which might come to the final manufacturing plan to request a quote for proposal to the external manufacturer. The whole development process from scratch is assumed to be in 1 year at maximum.

4.12.2 Organizational plan

The GreenPanels team currently consists of the owner Danny Višvader with experience in management, marketing, developing products, hiring and legal matters from his previous business activity and studies at the University of Life Science in Prague, Czech Republic in Economics & Management.

The owner hired an external accounting company. As the project is in pilot stages of development, still even in the ideation stage, the owner has not hired any development members yet, therefore members to fill positions of one software engineer and one hardware engineer as Co-CTOs each for different aspect of the project but supportive of each other.

To lower the risk, the owner is willing to offer each engineer a stake in the company as compensation instead of a salary. The offer would be 15% each as their potential contribution to the project is high but at the same time the owner wants to remain the

major stakeholder while being open to allocate up to 30% of his shares in the future to investors and new employees.

Eventually but not necessarily the company might hire a content creator for all the stakeholders of the company to give them insights of the project through social media.

4.12.3 Marketing plan

Instagram & Facebook to target the market we have outlined with market research rounded up to 122 000 potential customers. With price ranging from 20 to 50 CZK per 1000 customers reached we estimate the cost to 4270 CZK but to increase the probability of a spread, the amount invested can be doubled.

The persuasion of influencers presents on social media ought to spread awareness of the MyGarden app, GreenPanels and the overall growing methodology.

A fair in Prague called FOR-GARDEN currently charges per 1m² minimum 1 750 CZK with the minimum size of 9 m² setting the minimum price for a spot at the stated fair 15750 CZK

Offering lower bulk prices to hardware chains in exchange for marketing at site is also possible, for example a 5% deduction from the purchase price.

Other marketing expenses would account for the distribution of fliers for 1 500 CZK at around 1,5 CZK per flier in quantities above 1 000 pieces.

4.12.4 Financial plan

The initial capital of the company is 100 000 Czech Crowns is deposited by the owner.

Initial Investments

To create an optimal environment for the company operations, certain assets are needed. The assumption to the calculation is that all 3 shareholders own their own laptop to work on the development of GreenPanels.

Initial investments	Price in CZK
3D printer	7 500,00
Furniture	30 000,00
Equipment (Soldering iron, drawing board, printer)	10 000,00
Total	47 500,00

Table 2 - Initial investment calculations (Source: Author)

Monthly expenses for services

Recognized operational expenses include the rental of an office where united development would take place. To allow the operations, phone, internet, and electricity bills need to be covered. There is an option for the owner to take care of the accounting himself but the lack of experience in the field requires him to hire an external accountant with monthly payments.

Monthly expenses for services	Price in CZK
Internet	500,00
Phone	500,00
Office rent	12 000,00
Electricity	1 000,00
Accounting	3 000,00
Total	17 000,00

Table 3 - Monthly expenses calculation (Source: Author)

Yearly expenses for services

The monthly expenses have been multiplied by twelve months to give a yearly overview of the costs.

Yearly expenses for services	
Internet	6 000,00
Phone	6 000,00
Office rent	144 000,00
Accounting	36 000,00
Electricity	12 000,00
Total	204 000,00

Table 4 - Yearly expenses calculation (Source: Author)

Cost of development

During the project's development stage, prototypes must be developed to understand potential customers' needs and receive feedback to improve the product and minimize the risk. The development is differentiated into hardware and software environment with specific needs to fulfill their tasks.

Hardware	Price per unit	Number of units	30 units
Components	240	30	7 200,00
Filament	150	30	4 500,00
Accessories	2000	1	2 000,00
Software			
Domain for 5 years	1000	5	5 000,00
Total			18 700,00

Table 5 - Hardware and software development cost calculation (Source: Author)

Unit cost in bulk manufacturing

The price of the components and the case to fit them at the prototyping level is considered without taking any advantage of bulk discount prices strategies. The price deduction of 25% from the total price of the order is assumed for the manufacturing of larger quantities. The quoted price of a manufacturer on Alibaba.com is set to approximately 40 CZK for injection molding with a suitable material.

Bulk manufacturing Estimation	Price per unit
Components	180
Plastic	40
Total	220

Table 6 - Cost of bulk manufacturing calculation (Source: Author)

Starter pack unit cost breakdown

The company offers complementary products to increase the yield of the product. These products are nutritious tonics and medium to fit the seedling into. The company will try to increase the presence of GreenPanels in households, therefore, a starter pack including all the necessities to make the process easier would be a great idea. Each product is now broken down into variable costs and the break-even point for each type of sale, either the starter-pack or a single unit is analyzed as well as the combination of the products sold on the market through the weighted break-even point taking more products at once into consideration. In this case, it is assumed that 70% of the sales are made by product A (Starter-pack sales and product B (Individual GreenPanel) takes up 30% of the monthly revenue. For further calculations, the total cost of the Starter-pack made of nutritious blend which will be purchased at 20 liters which is going to be divided into 100 milliliter bottles to give the customers just enough to cover 2 full cycles of growing with the GreenPanels starter-pack.

Nutritious blend	Quantity purchased	Price in CZK per unit	Price total in CZK	Price in CZK per unit
20L divided into 100 ml bottles	1	5000	5000	25
100ml bottles	200	7	1400	7
Caps	200	2	400	2
Total			6800	34

Table 7 - Cost of Nutritious blend calculation (Source: Author)

Medium for the seedlings	Quantity purchased	price per unit
Grodan Rockwool	1	2
Total		2

Table 8 - Cost of medium for the seedling calculation (Source: Author)

Starter pack manufacturing price	Cost per unit	Quantity included in the starter pack	Cost per the starter-pack
Panels	220	3	660
Rockwools	2	20	40
Nutrition blend	34	1	34
Packaging	20	1	20
Total price per Starter pack			754

Table 9 - Cost of manufacturing of the Starter pack calculation (Source: Author)

Break-even point analysis

To perform a break-even analysis, the contribution margin for the Starter-pack and the individual panel to fit the formula is calculated.

Contribution margin	In CZK
Sold for	1499
Cost	754
Contribution margin	745

Table 10 - Contribution margin calculation (Source: Author)

The performed break-even analysis of the sold products is based on monthly expenses.

Monthly break-even point for the starter-pack	
Monthly fixed cost	17 000,00
Contribution margin	745
MBEP	22,82

Table 11 - Starter pack monthly break-even point analysis calculation (Source: Author)

Monthly break-even point for the GreenPanel	
Monthly fixed cost	17 000,00
Contribution margin	279
MBEC	60,93

Table 12 - GreenPanel monthly break-even point analysis calculation (Source: Author)

Weighted break-even point provides us with the information on the number of products sold together giving us an overview based on the scenario where revenue is created by the Starter-pack from 70% and the rest is generated by the sales of individual panels.

Monthly weighted average break-even point: Starter-pack sells 70 to 30	
Weighted average selling price	1163
Weighted average variable expenses	611,5
Weighted contribution margin	551,5
WBEP	30,83

Table 13 - Monthly weighted break-even point analysis in 7:3 sell ratio (SP:GP) calculation (Source: Author)

Results of the BOP Analysis

Due to the limitations of the market research, the break-even analysis acts like a milestone to reach. As the type of product is a new industry it is uncertain what the collective sales in the market are and who are the exact individual customers, the potential sales of the company cannot be evaluated and forecasted. With the assumed product sales ration, based on the BOP of 31 products, the company should sell monthly at least 22 Starter-pack and 9 single panels not including any other accessories for simplifications.

Company's sustainability on the market

Initial capital	100000
Initial investment	47 500,00
Monthly cost	17 000,00
Months sustained from the initial capital	3,09

Table 14 - Company's sustainability on the market with only the initial capital calculation (Source: Author)

Due to innovative approach towards home farming, the market size is not yet fully known which prevents calculating potential revenues. Instead of calculating the optimistic and pessimistic levels of income, only break-even point analysis has been conducted to at least outline the requirements for business sustainability on the market.

As the calculations signify, the owner's initial investment of 100 000 CZK would last for only 3 months before running out therefore additional investment is needed. Secondary financing comes from the buy-ins of the two partners or developers. Third source of the development financing are EU subsidies or full external investment from a venture capital firm or an angel investor.

Initial capital	100 000
Initial investment	47 500,00
Cost of development for 3 years	612 000,00
Sought investment for development	559 500,00

Table 15 - Amount of capital investment sought for 3 years of development calculation (Source: Author)

The amount sought accounts for 559 500 CZK which would provide the company with enough capital to keep up the development for the upcoming 3 years.

4.13 SWOT analysis

Strength

Design

One of the unique selling points of the business is the design of the product. Minimalistic, sleek, and modern to fit into any environment.

Space utilization

Where the company differentiates from the competition or substitution is the ability to exist without sacrificing any usable space.

Technology

The guts of any of the main products provide a wide set of features which few companies can compile into one platform. This includes the features of the app like the learning path, record keeping, photo analysis of the plant, data analysis of the environment, most importantly the managing of your crops and much more. In the case of the GreenPanel, it is the overall care of the plant.

Weaknesses

Price

The pricing strategy is to cover the cost at least once which creates a risk especially in the Czech Republic which may result in low sales as Czech's willingness to buy is currently lower than the standards. This gives the business the opportunity to focus on the more premium market.

Over-engineered product

Unfortunately for the company, the physical system may bring some challenges in setting up the devices resulting in bad reviews due to customer's frustration.

Opportunities

Rise of the silver society

Constantly increasing percentage of population knowledgeable in the uprising technologies allows companies like GreenPanels to include technology in their solutions for the slowly growing market.

Gap on the learning app market

Current lack of knowledge in a field of agriculture, farming and personal growing among young people creates an opportunity for the learning platform in MyGarden app with the support of increasing social media trends of personal growing and learning about home farming.

Conventional soil growing

Thanks to the complementing products like filters, opportunity within more known soil farming arises as automated irrigation could be then used.

There are many possibilities for the product portfolio and the idea of a simple plug and go solution is one of them. It would serve as an attachment to any pot with a container in the back and it would be connectible to the MyGarden app so the user could manage it from anywhere. *(See figure 8)*



Figure 7 - Plug and go solution product concept. (Source: Author)

Farmer's social media

Communities among growers currently exist on a mouth-to-mouth basis, just like with mushroom hunting, people tend to brag about the vast amounts they found. This culture creates an opportunity to create a platform for sharing people's produce for sale to limit waste just like usual in rural Czech Republic, or simply just to show off.

Threats

Low demand and low awareness

The customer perception is not yet to be known. A study regarding aquaponics which can be considered valid to aeroponics too has been conducted in Minnesota, US which resulted in poor awareness of aquaponic growing method but upon learning more about the system through the survey, respondents tended to be neutral or favorable to aquaponics. (Short, 2017)

As far as the project is in the innovation stage, there are no data supporting the project's positive potential or pessimistic outcome. The owner currently collects feedback from the environments he takes part in e.g., students at universities, IT managers at different events and in the public.

New competitors

The entry of new companies into the market threatens the outcome of the project. As the company has international aspirations, the risk is exorbitant.

Owner's lack of experience

The owner has previous experience with another project which failed due to lack of demand and strong seasonality.

Poor partnership choice

To raise resources for the development, the owner considers redistributing ownership in the company to partners with the correct knowledge. While looking for a partner, there is a chance the owner's choice will not concur with the company's mission.

Input price

The price of the material and most importantly of the freight while taking advantage of outsourcing can be easily influenced by the legal aspect of the external environment.

Outsourced supplier

Outsourcing to a foreign country comes with certain risks that must be taken into consideration. The current military situation on the European continent raised questions of global cooperations in logistics.

Competition

As there are plenty of competitors already offering substitution for the company's product in a much simpler way, GreenPanels might scare away potential customers by being "over-engineered."

Investment

Lack of investment poses the project an inevitable threat.

Awareness

The lack of current public awareness may result in low demand.

Insufficient knowledge in farming and technology

The main resources needed for the project to even begin is the knowledge in the field of growing and technology which the owner lacks and tries to find partners more familiar with this topic.

5 Conclusion

The conclusion to the bachelor thesis is the fact that the project is not feasible in the current environment even though many trends signify otherwise. The threats to the business prevail the positive seemingness.

Among the most significant threats is the unknown actual market size, the number of potential customers is yet not known and as the project plans to produce a product on the not yet fully established market it therefore poses an enormous risk.

Next threat is the high manufacturing cost which creates requirement for high purchasing power of the customer and as specified in the PESTLE analysis in the Czech Republic, the level of uncertainty due to the high level of inflation and current conflict on the European continent does not allow consumers to spend the excess money on wants, rather than needs which are at the bottom of the Maslow's pyramid of needs (Pichère, 2015). The basic idea is to let people have a custom sized garden based on the consumers wish, unfortunately the sales price of each panel is too high for a regular consumer to purchase a wall full of these.

Next disadvantage of the product is the low yield each sale generates as the panel includes too many features, the price climbs too high for it to be justified to sell, primarily when the risk of uncertainty is too high based on a survey on people's awareness of hydroponics conducted in the U.S. covered in the SWOT analysis where this method originated meaning there is low chance there is higher awareness of aeroponics in the EU.

Another drawback is the fact there are many substitutes for the same or lower price than the GreenPanel, not offering the same features but delivering the same results, growing plants and vegetable at the similar rate.

Coming around back to the financial feasibility, the project's nature doesn't allow to produce any solid evidence for the market size therefore the calculations for potential return on investment are non-existent. The only viable calculations offered by the business plan are monthly sales goals provided by the break-even point analysis.

There would be a chance to move into the premium market which might give the business even higher level of uncertainty and due to lack of feedback on the idea, the success rate is rather close to single digit numbers. The awareness could be solved by spreading the idea through press and social media but the expenses for the business might even increase by being the pioneer of the growing method.

The project is concluded as unfeasible due to high cost, low awareness of the method used for growing, low reward, and high risk due to high level of uncertainty.

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