

BUSINESS PLAN DEVELOPMENT FOR A START-UP COMPANY



Bachelor's thesis

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ABSTRACT

This study was commissioned by Häme University of Applied Sciences. The aim of the study was to come up with a business plan for developing the new product and starting a new company in Finland in the electric bicycle market.

The main objectives of the study were: to collect and analyse suitable theoretical background, including business planning and product development theory as well as information on financial instruments available particularly in Finland. The second objective was to develop and conduct research based on the examined theory that will cover the most important issues on product development and funding. The third objective was to develop the idea in a way it will be clear to be presented to investors and mentors. The last objective was to accumulate from the outcomes of the first three objectives and to compose a holistic business plan.

The theoretical concepts, which this research covers, include: business model generation including a business model canvas and a business model environment, the blue ocean strategy, the lean start-up approach, and the funding options for businesses. The research methods used were: literature research, consultations with potential and existing customers, attending presentations of start-up advisors and representatives of public funding.

The main outcome of this work is a created business plan, financial calculations for the first product development stage and a financial roadmap. All these are enclosed as appendices to this thesis work.

Keywords Electric bicycle, product development, business model generation, business plan

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1 INTRODUCTION

In this chapter the author aims to give a justification for the importance of business plans in the current business environment, as well as to introduce the research questions, the research objectives and the methods used in this project.

1.1 Background information

A business plan describes and analyses in a written form business and gives a detailed forecast about its future. It also covers the financial side of starting or expanding a business. The process of writing a business plan has its own benefits. The detailed analysis, in the first place, demonstrates to the author whether it is rational to start and/or expand the business. Additionally, it helps to improve the business concept, manage resources, anticipate problems, eliminate disasters and, overall, increase chances for success. Most lenders, investors and even some landlords require a written business plan before they will consider your venture seriously. (McKeever 2007, 8.)

Business plans are especially relevant since they help companies to keep on track for important issues, they make decision making easier and avoid distractions.

The author chose this thesis topic to gain profound expertise and experience in this field during the project and to benefit from the outcomes. The purpose and the objectives were thoroughly discussed and defined between the author and the supervisor.

A major advantage of this thesis project was that the author is currently running his own business as a co-founder for Go Double A Oy and plans to expand it. The success of this research project is of a personal value and interest to the author.

1.2 Purpose

The main purpose of this thesis was to examine the business planning process to the extent that would enable the author to uncover the possibilities for starting a new company in Finland in the field of electric bicycles, to study specific features of the local investment environment as well as methods to get funding, to cover all product development issues to be prepared for delivering products to the market.

1.3 Research question and objectives

Research question was: “How could the author create a start-up in Finland, get funding for developing products and deliver them to the market?”

Based on the research question and the purpose of this study, the following objectives were determined:

- The first objective was to collect and analyse a suitable theoretical background, including business planning and product development theory as well as information on investment instruments available particularly in Finland. This objective was to provide the necessary information for understanding the process of starting a company and for avoiding the most common mistakes or ineffective methods there. Additionally, knowing the theoretical side provided confidence and familiarity in everyday business operations.
- The second objective was to develop and conduct a research project based on the examined theory that would cover the most important issues meaningful for product development and funding.
- The third objective was to develop the idea in a way it that would be clear to present to investors and mentors.
- The last objective was to accumulate the outcomes of the first three objectives to compose a holistic business plan.

1.4 Methods

In order to complete this thesis with relevant practical and sufficient theoretical background, the following research methods were used: literature research, consultations with potential and existing customers, attending presentations of start-up advisors and public funds' representatives.

The literature research aimed at finding the most suitable theories and background materials, in order to fully understand requirements of business environment. This includes familiarity with product development approaches and strategies, business model generation and needs and requirements of investors or governmental funds.

Interviews with potential and existing customers included the feedback from people who did test-rides of electric bicycles arranged by Go Double A Oy and who ordered electrification services from the company.

2 BUSINESS MODEL GENERATION

In this chapter will be presented different theoretical topics related to the research question of this thesis. In the first half of the chapter are introduced business model canvas and business model environment, while in the second part of the chapter the topics are blue ocean strategy and lean start-up approach.

2.1 Business model canvas

A business model canvas is an instrument to visualize the business model of a company in order to make it easy to understand, describe and manipulate with. It is defined with nine basic blocks that cover four main business areas: customers, offer, infrastructure and financial viability. (Osterwalder & Pigneur 2010, 15.)

Here the author describes the business model blocks in more detail. In the next chapters of this work the author evaluates his business idea using the business model canvas as illustrated in Figure 1.

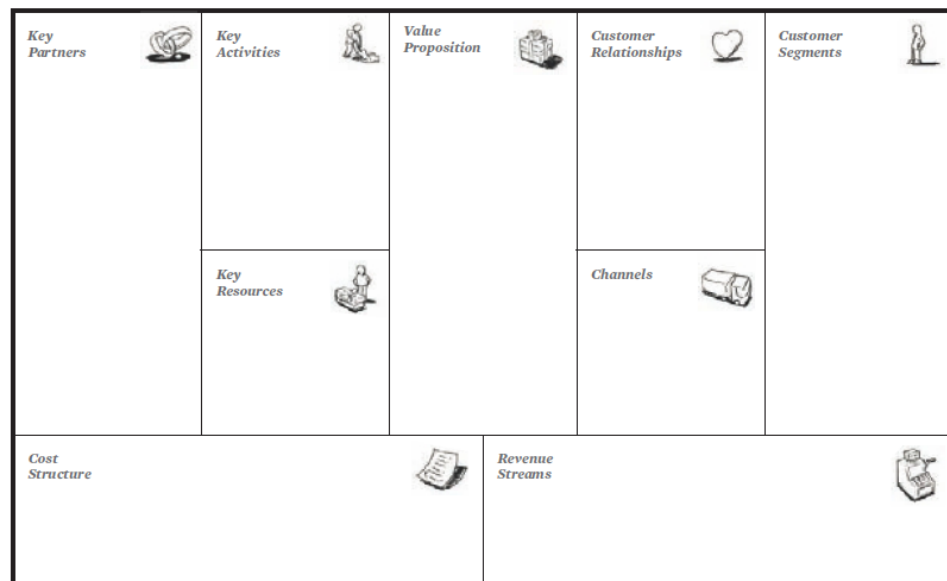


Figure 1. Business model canvas (Osterwalder & Pigneur 2010, 41).

2.1.1 Customer segment

A customer segment defines the group of people or organizations the company aims to reach. Normally business model specifies one or several customer segments, so it can concentrate its focus on satisfying certain customer needs and demands. Separate segments differ by their needs and requirements, types of relationships and distribution channels, as well

as have essentially different profitabilities. (Osterwalder & Pigneur 2010, 20.)

Examples of customer segment types are: mass market (business model does not distinguish between various customer segments, rather focuses on a large group with broadly similar needs and problems), niche market (business model targets specific well-defined customer segment), segmented (business model serves similar segments but with varying needs and problems), diversified (business model targets several unrelated customer segments with different needs and problems) and multi-sided platforms (serving two or more independent customer segments that are complementary to each other). (Osterwalder & Pigneur 2010, 21.)

2.1.2 Value proposition

Value proposition describes product and services that create a value to the customer segment through satisfying its needs and solving its problems. Values can be quantitative (e.g. price, fast delivery) or qualitative (e.g. design, customer satisfaction). Newness, improved performance, customization, design, brand, price, cost and risk reduction, accessibility, usability and “getting the job done” can contribute to customer value creation. (Osterwalder & Pigneur 2010, 23-25.)

2.1.3 Channels

Channels characterize the ways how a company delivers value to and communicates with customer segments. These include communication, distribution and sales channels. A company’s task is to find the right mix of channels to reach the customer segment in order to bring the value proposition. Channel phases are: awareness, evaluation, purchase, delivery and after sales. (Osterwalder & Pigneur 2010, 27.)

2.1.4 Customer Relationships

Customer relationships define the type of relationships the company wishes to establish with its customer segments. There are several reasons to establish unique relations, which are: customer acquisition, retention and upselling. These are the common types of customer relationships: personal assistance, dedicated personal assistance (each individual customer has his own representative), self-service (customers are provided with tools to help themselves), automated services (are more advanced compared to self-service through simulating personal relationship), communities and co-creation. (Osterwalder & Pigneur 2010, 29.)

2.1.5 Revenue streams

Revenue streams describe the cash flow received from customer segments. Different ways to generate revenue streams include: asset sales, usage fee, subscription fees, lending/renting/leasing, licensing, brokerage fees and advertising. (Osterwalder & Pigneur 2010, 31-32.)

2.1.6 Key resources

Key resources represent the most valuable assets required to enable business model operation. Key resources allow a company to produce and offer a value proposition, enter markets, maintain relationships and earn cash. These are industry specific and can be physical (e.g. manufacturing facilities, vehicles, machinery, distribution networks etc.), financial (e.g. loans, cash, stock option pool etc.), intellectual (e.g. brand, IPR, partnerships, customer databases etc.) or human. (Osterwalder & Pigneur 2010, 34-35.)

2.1.7 Key activities

Key activities are most important tasks the company performs to operate successfully. They allow a company to produce and offer a value proposition, enter markets, maintain relationships and earn cash. The common key activities are: production (all actions needed to undertake to bring product to the market, including design, manufacturing and delivering), problem solving and platform/network. (Osterwalder & Pigneur 2010, 36-37.)

2.1.8 Key partnerships

Key partnerships determine all relationships that help company to optimize its business model, decrease risks or obtain resources. Partnering with suppliers allows to benefit from economy of scale through reducing costs, outsourcing or infrastructure sharing. (Osterwalder & Pigneur 2010, 39.)

2.1.9 Cost structure

Cost structure defines all costs that arise from business model operation. The one should be aware of costs incurred from delivering value proposition, maintaining customer relationships, or generating revenue. Company should recognize if its cost structure is cost-driven or value-driven. Cost structure can be assessed through fixed and variable costs, economies of scale and economies of scope. (Osterwalder & Pigneur 2010, 41.)

2.2 Business model environment

According to Osterwalder & Pigneur (2010, 200) it is crucial for businesses to evaluate not only the internal processes, but also to continuously scan external environment since growing complexity of economic landscape, greater uncertainty and severe market disruptions have strongest impact on business models. This environment can be described by four areas: market forces, industry forces, key trends and macroeconomic forces as seen on Figure 2. Mapping business model environment with trends affecting the business processes gives a better understanding of directions in which business model might evolve, challenges it may need to overcome or threats it should avoid.

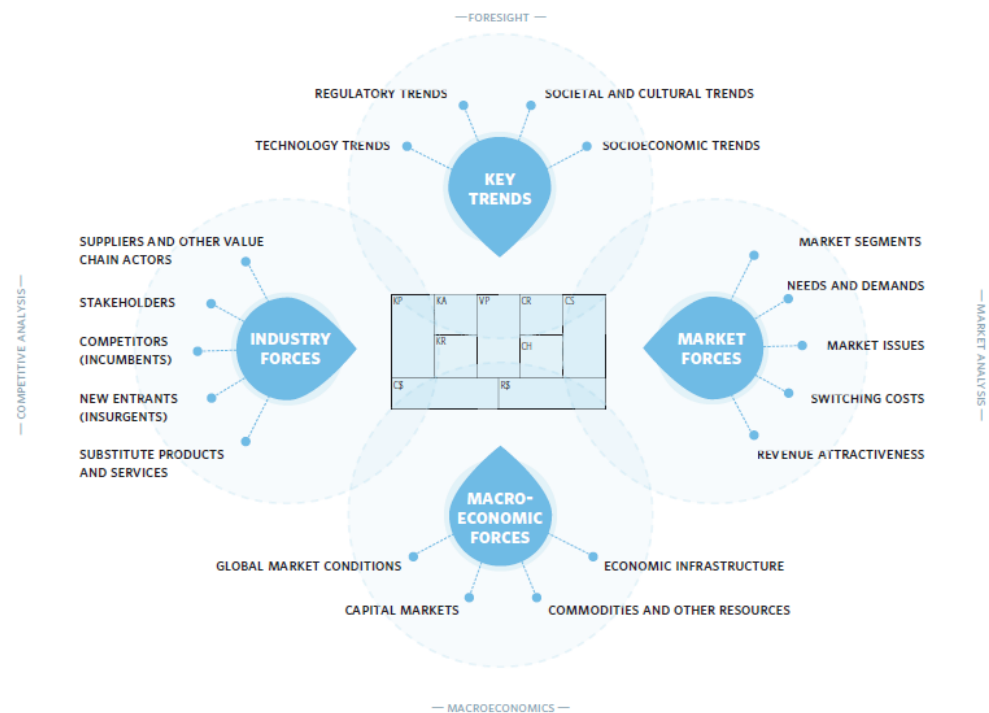


Figure 2. Business model environment: context, design drivers, and constraints (Osterwalder & Pigneur 2010, 201).

2.2.1 Market forces

Market forces business environment area consists of market issues, market segments, needs & demands, switching costs and revenue attractiveness. It covers factors that influence market from customer and offer perspective, identifies a major market segments and those that have biggest potential in the future. Needs and demands analysis gives a better understanding of customer's requirements and decision making, meanwhile switching costs define factors preventing customers from switching to competitors. (Osterwalder & Pigneur 2010, 202.)

Switching costs protect companies from competition, lower customer acquisition costs, retain existing customers and help generating recurring revenues. Customers stay because they are locked into companies' ecosystems through high switching costs. (Amarsy 2015.)

2.2.2 Industry forces

For a business knowing its direct and indirect competitors as well as suppliers allows to differentiate and better plan the market strategy based on their relative strengths and weaknesses, influence, main offers and positioning. Stakeholders are those who may influence the organization or business model from inside (workers) or outside (government, lobbyists etc). (Osterwalder & Pigneur 2010, 204.)

2.2.3 Key trends

According to Osterwalder & Pigneur (2010, 206) there are technology, regulatory, social & cultural, and socioeconomic trends. Technology trends identify technologies that can be either an important opportunity or a disruptive threat for a company's business model. Meanwhile regulatory trends define public rules or regulations affecting both business model and customer demand. Demographic trends, income and wealth distribution, spending patterns etc. comprise socioeconomic trends.

2.2.4 Macro-economic forces

Macro-economic forces are described by global market conditions, capital markets, commodities and economic infrastructure. Economy's state, market sentiment, GDP growth and unemployment rates might have a crucial impact on business processes. Additionally, businesses strongly rely on various financial instruments and their availability: seed capital, venture capital, public funding, market capital, credits or others. Commodities may include essential resources (e.g. oil prices, labor costs), their costs and availability. Economic infrastructure is described by means of transportation, trade, education quality, taxation, quality of life, access to suppliers and customers. (Osterwalder & Pigneur 2010, 208.)

2.3 Blue ocean strategy

Blue Ocean Strategy is a systematic approach to making the competition irrelevant through unveiling new market opportunities. (Kim & Mauborgne 2005, 5.)

Many companies are concentrating on gaining advantages over competitors usually by assessing what they have done and trying to do the

same better. In this context, the winning of a larger market share is seen as a zero-sum game, when the gain of one company is obtained through the loss of the others. On the other hand, market structure and boundaries exist only in the minds of managers. Hence to unveil new market opportunities, it is necessary to switch attention from supply to demand and from competition to value innovation. (Kim & Mauborgne 2005, 9-12.)

Innovation of value is created when the company's actions have a beneficial effect on the cost structure and value offering for customers. Reduction of costs occurs due to eliminating or reducing factors that most companies in a particular industry compete on. Value for consumers increases due to the creation and development of elements that the industry has never previously offered. Over time, costs additionally decrease due to economies of scale. (Kim & Mauborgne 2005, 16.)

2.3.1 Blue ocean strategy tools

To simultaneously work on value creation and costs optimization, companies should avoid copying competitors' business models. And strategy canvas is a tool for diagnosing existing business models and constructing a new "blue ocean strategy" approach. Its serves two main purposes. Firstly, it helps reflecting the current state of play in the specific market space, which allows to see factors that the industry competes on. Secondly, strategy canvas helps to reorient focus from competitors to alternatives and from customers to non-customers. (Kim & Mauborgne 2005, 25-28.)

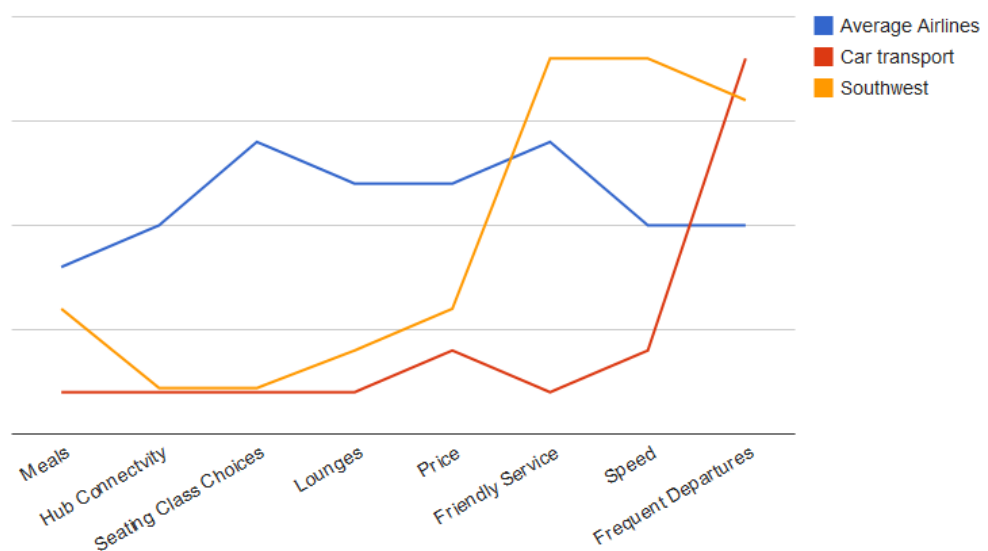


Figure 3. An example of strategic canvas for Southwest Airlines (Kim & Mauborgne 2005, 38.)

According to Kim & Mauborgne (2005, 29) the Four Actions Framework is used to break the trade-off between differentiation and low cost in creating a new value curve. The four framework questions are:

1. Which factors that the industry takes for granted should be eliminated?
2. Which factors should be significantly reduced in comparison with the existing industry standards?
3. Which factors should be significantly increased in comparison with the existing industry standards?
4. Which factors should be created that the industry has never proposed?

Eliminate-Reduce-Raise-Create Grid as seen in Figure 4 is an analytic tool that complements the Four Actions Framework. It pushes companies to act, determining which factors will eventually be eliminated and reduced to optimize the cost structure and which will be raised and created to add new value, which is essential to unlocking a new blue ocean and crafting new value curve. (Kim & Mauborgne 2005, 35-37)

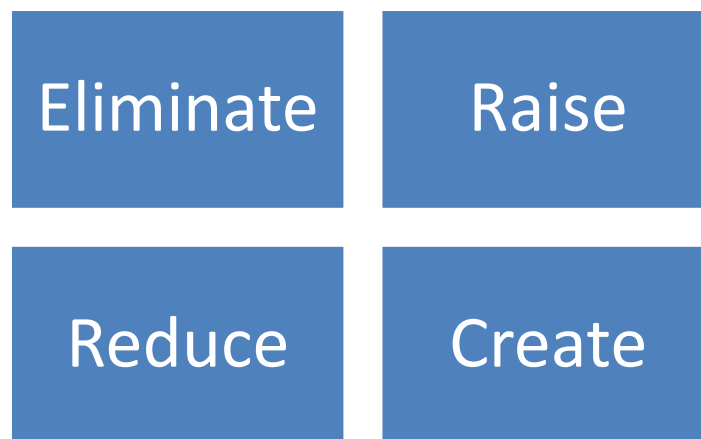


Figure 4. Eliminate-Reduce-Raise-Create Grid (Kim & Mauborgne 2005, 35)

2.4 Lean start-up

In today's world, one can create and produce almost anything that he/she is able to imagine. But it is more important to validate if there is a need for the product. Consumers should have a problem that the start-up is trying to solve. Additionally, they should be ready to pay for such a solution of their problem. Hence, the key question here is not whether a company can develop a certain product, rather whether it is rational to develop the product and can a company become a sustainable business around this set of products and services? The lean start-up model is a systematic method for breaking down a business plan into its component elements and testing each part empirically. (Ries 2011, 61.)

According to Ries (2011, 55, 70), the key concept of a lean start-up is to eliminate waste and to emphasise value-creating. The goal is to recognize waste and systematically remove it. Lean thinking defines waste as something that does not provide any benefit to the customer. Systematic identification of which options are needed and which ones are not, is a key performance metric for a lean start-up. The key questions before starting product development are:

- Do consumers recognize that they have a problem that the company is trying to solve?
- If the company offers a solution to this problem, are the customers ready to pay for it?
- Will they pay to the company or its competitors?
- Is the company able to offer a solution?

The first step to validate an idea is to break down the grand vision into its component parts. Value and growth hypotheses are two most important assumptions that need to be validated. And experiments help evaluate these better than regular surveys. Then minimum valuable product should be created to enable conduction of experiment. (Ries 2011, 68.)

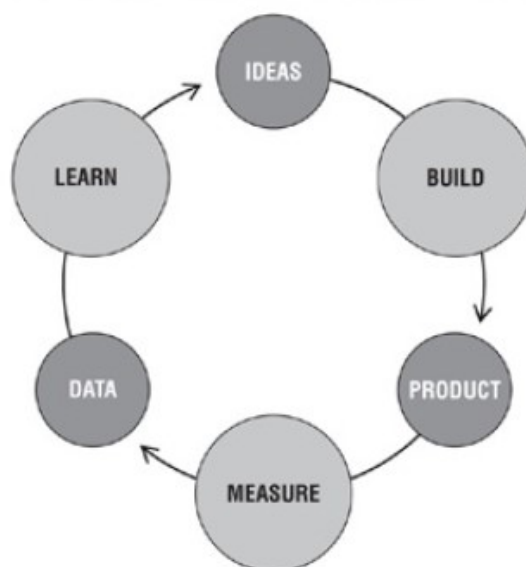


Figure 5. Build-measure-learn feedback loop (Ries 2011 , 81)

Every business plan begins with a set of assumptions. And the primarily goal of start-up is to test them as quickly as possible. This composes the strategy: taking those assumptions as a given and trying to validate the company's vision. And first challenge is to build an organization where these assumptions are tested systematically. Acting in environment of uncertainty is called leap of faith. (Ries 2011, 86-87.)

The minimum valuable product (MVP) helps entrepreneurs to start the learning process as soon as possible by testing out assumptions. This is not necessarily the simplest product that can be imagined, but it should be developed to the extent when it allows to go through the entire feedback loop "build-measure-learn" as quickly as possible, with minimal efforts applied. (Ries 2011, 96.)

Leap of faith assumptions should be turned into a quantitative financial model, which gives an understanding what key metrics are to be considered to validate the company's progress on the way to success. This so-called innovation accounting consists of three milestones: establishing a baseline (real data on where the company is right now, e.g. conversion rates, sign-up and trial rates, customer lifetime value and so on of the first MVP), tuning the engine (performing actions targeted at improving one of growth model drivers) and pivot or persevere stage. To analyse the data, it is advised to use Cohort analyses method. (Ries 2011, 117-120.)

3 FUNDING

3.1 Introduction

In this part of the work the author covers types of financiers and financial instruments available for start-up companies in general and particularly in Finland. The idea is to get acquainted with the requirements and motives of financiers and to understand the suitability of specific financial instruments at different stages of business development. The outcome will be a roadmap of funding for a start-up company.

3.1.1 Company stages

Stages of company development differ and have their own requirements when seeking for an investment. Hence it is important to clarify their borders. According to Etula (2015, 15) the various stages of a company could be described as follows:

- Pre-seed stage. It is not necessary to have a registered company, only a team with an idea. Investments are needed for first stages of product and idea development.
- Seed stage. The team unveiled their first version of the product/service. The investment is used in verifying and starting up product development or a business model.
- Start-up/survival. The team has grown and moved out of “the garage” into its own premises and launched the first version of the product. Expenses exceed turnover and the primary goal is to get over the “valley of death”. An angel investment is usually used for product and market development or working capital.
- Later growth stage. Business expands internationally. Incoming cash flow exceeds outgoing payments and the business begins to accumulate cash. The investment is used to accelerate growth.
- Expansion stage. The company already has considerable turnover and aims to expand to ever-new markets, product groups or industries.

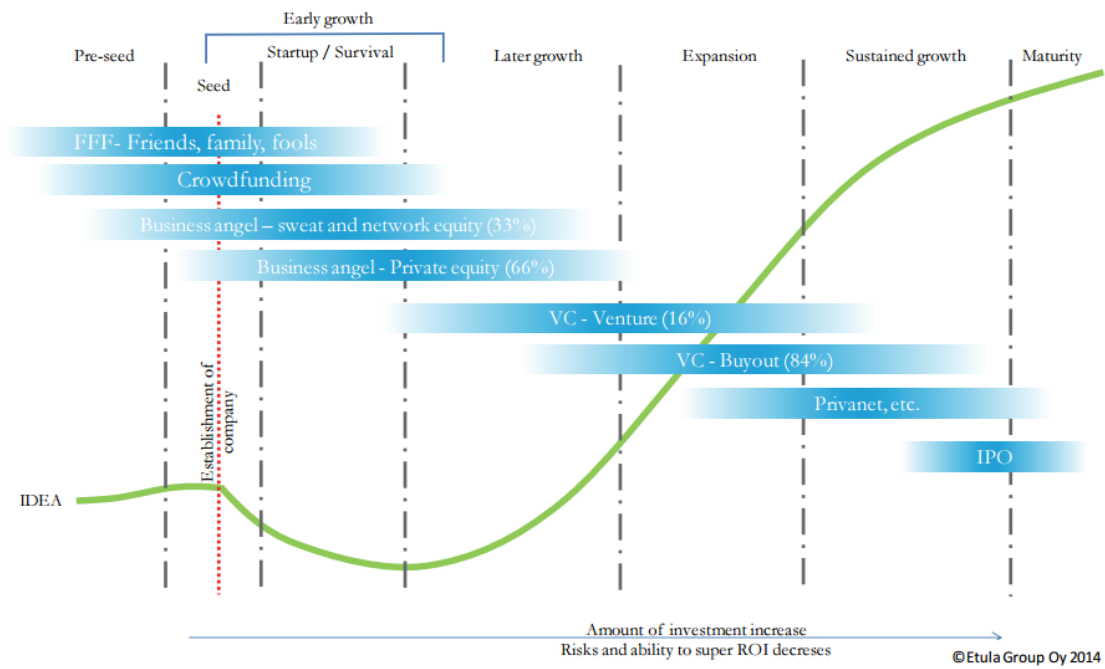


Figure 6. Investor options at various stages of a company’s lifecycle (Etula, 15)

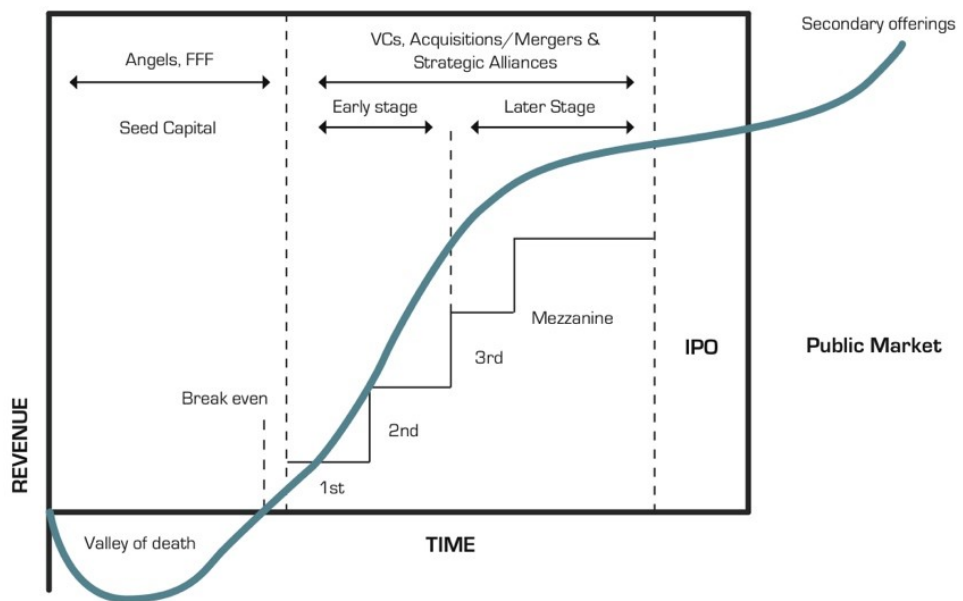


Figure 7. Investor options at various stages of a company’s lifecycle (Oker-Blom n.d.)

3.2 Methods for raising money

Among common methods of raising money the ones that can be mentioned are loans and equity investment. Here the author will cover these in more detail.

A loan is a simple concept: someone lends money in exchange for the promise to pay it back with an interest, which compensates the risk of lending money. There are many variations of loan types, but the most typical ones are: fully amortized loan (principal and interest paid off in equal monthly payments) and balloon payment loan or interest-only loan (interest-only payments until the entire principal amount becomes due and payable). Additionally, loans might be secured (borrower pledges collateral) or unsecured (though there is no collateral, the lender can still sue the borrower if the last mentioned fails to repay a loan). (McKeever 2007, 53-56.)

An equity investor becomes a part owner of business. This means he/she shares both the risks and the profits. Though an equity investor risks only the money he puts up to the business. (McKeever 2007, 56.)

The huge advantage of equity finance is that it does not require servicing, unless start-up makes enough profit that company's board decides to pay dividends. There is no commitment to pay out dividends to shareholders unless the company can afford to do so, unlike with a loan. On the other hand, equity finance is overall more expensive, and loan is less flexible. In general, the more stable the business is, the more company should try to get debt funding in preference to equity. (Evans 2015, 137.)

3.2.1 Friends, family and fools

Financing provided by family or close friends in its core does not differ much from that provided by strangers. The funding might be in the form of a gift, a loan, gift-loan hybrid or an equity investment. The main differences are normally the availability of money and the interest rates or investment returns. (McKeever 2007, 63.)

Dealing with this type of financiers has its own advantages: they already know your strengths and weaknesses; they are likely to be more understanding than a banker if you encounter any start-up problems or are late with loan payments. Nevertheless, it is wise to treat people close to you in a businesslike manner. Always think twice before taking money from your friends or relatives since it may have a negative impact on your relationships. (McKeever 2007, 64.)

3.2.2 Trade credit

Trade credit means ordering from suppliers and paying them, e.g. 30 or 60 days upon receiving. This can help considerably for companies in retail, wholesale or the manufacturing business. It is crucial to maintain good relationships with suppliers in this case and keep them informed and updated on all matters. Suppliers are interested in seeing the company's growth, since this means the company will order more from them later. Hence it is a normal practise for suppliers to extend trade credit after establishing good relationships with a record of prompt payments. (McKeever 2007, 63.)

3.2.3 Banks

Normally banks lend money for start-ups if there is a low risk (the company can provide predictable cashflow to pay back a loan) or if a start-up provides strong collaterals to additionally secure a loan. (McKeever 2007, 66.)

As it was stated earlier bank loans are preferable and cheaper to equity investments in case the business is stable.

3.2.4 Business angels

Business angels invest their own assets in unlisted potential growth companies. They might take an active or a passive role in the company. Their investments are always minority investments (normally, 10-40%) in pre-seed, early or later growth stages. Angel investing is always temporary and the target duration is approximately five years, though the average is over eight years. Angels frequently seek investments which are close to their knowledge and contact networks, as well as in terms of geographical location. Few angels invest in companies located further than 200 km from them, other than through syndicates. Seeking angel investment might be a good option when a company's valuation does not exceed EUR 5,000,000 (typically below EUR 1,200,000), when it is about to grow fast and scale up, but has already used the founders' own and fff's resources. (Etula, 18-20.)

Additionally, business angels are to be considered as advisors and board members. Consequently, a start-up should match the angel's competences. "In fact, according to studies, substantially better results are achieved in a company by investing in sweat equity and network equity rather than simply private equity" (Etula, 17).

On the other side, when considering an investment decision, business angels take into account the same factors, such as: sweat equity that can be provided; available networks for potential customers or partners and

the amount of capital needed for the investment to succeed. Additionally, emotional factors are important as well. (Etula, 18.)

It is necessary to understand the business angel investment process. Normally, every investor develops his own process model. But there are some stages common to most of them shown in the Figure 8.

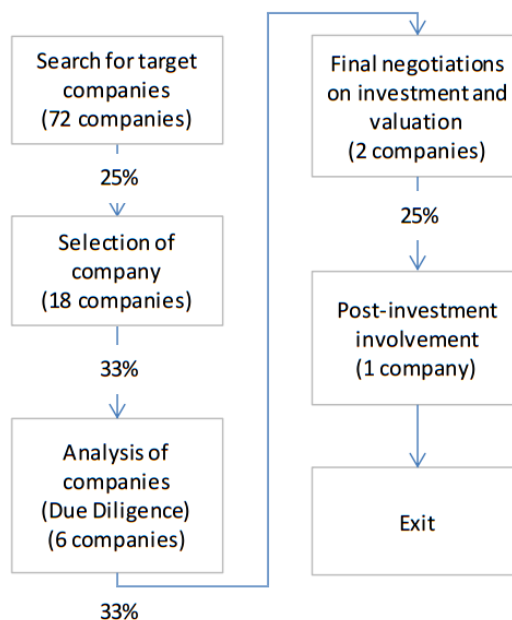


Figure 8. Business angel investment process (Etula 2017, 21)

According to Maisala (2017) most angels do not want to make any noise of themselves. There are only few professional business angels in Finland, meanwhile other are more “experimenting”. So, one needs networks to find angels. One way is to ask for referrals and to attend events, e.g. FiBAn ry, Slush, Arctic15. Additionally, Talouselämä has the most comprehensive list of rounds, where one can find a contact or referral at: www.talouselama.fi/kasvuyritykset

3.3 Finnish investment market

According to Tuomas Maisala (2017), a start-up advisor with 17 years of experience, the funding mix can consist of debts (e.g. bank loans), equity (e.g. founders’ private investments), grants or soft loans. For a start-up, it is crucial to understand its most important source of money. He divides typical financiers, that are available in Finland, into private and public ones. Among public financiers there are founders, friends, family & fools (the so called fff), accelerators, private banks, business angels, venture capitalists, corporate VCs and crowdfunding. Public financiers in Finland are E&ED Office / TE-tsto, Finnvera, Tekes, ETE Centre / ELY-keskus, EU and public VCs.

At the same time, it is important to understand that not every financier is available at a certain stage of business development. For example, venture capitalists practically do not invest into companies that are on an idea stage which can be seen in Figure 9.



Figure 9. Rough mapping of financiers in Finland by stage (Maisala n.d.).

3.4 Public funding

Based on Tuomas Maisala's presentation (2017), to set up a company and to start a business the most relevant public funding instruments would be a start-up grant of EUR 5,000 (Starttiraha) or microloans of EUR 5,000 to 35,000€ from Finnvera or start guarantee of less than EUR 80,000 from Finnvera. If a company is in the product development stage, then it is possible to apply for Tekes funding. Tekes (Finnish Funding Agency for Innovation) provides a Tekes innovation voucher for SMEs of EUR 5,000, Tekes Tempo of max. EUR 50,000 as well as Tekes R&D loans of EUR 100,000 up to EUR 1,000,000. For growth and internalization following funding instruments are available:

- ETE Centre (ELY): Development Grant for internalization (EUR 50,000).
- Tekes: YIC (NIY).
- Finnvera loans and loan guarantees for internationalization.

3.5 Tekes funding

“Tekes (the Finnish Funding Agency for Innovation) is the most important publicly funded expert organization for financing research, development and innovation in Finland. We boost wide-ranging innovation activities in research communities, industry and service sectors.” (Tekes n.d.)

According to Rantala’s presentation at a Microsoft flux event (2017), in 2016 Tekes R&D funding composed EUR 467,000,000 in total, EUR 142,000,000 of which went to start-ups. Companies that are younger than five years are considered to be so called start-up companies. Tekes provides various funding options for them, especially for those which have potential for substantial international growth. The first-place requirement is that company should operate and be registered in Finland. In case a start-up is under foreign ownership, created value should accumulate in the Finnish company funded by Tekes and the company’s growth should benefit Finland’s national economy. The assessment of positive effects and risks of a foreign-owned company is made from overall perspective. At the same time Tekes does not require any specific corporate structure or ownership model.

3.5.1 Innovation voucher

Innovation voucher is granted to startups and SMEs engaged in a well-established business, that are willing to launch innovation activities. One requirement is that the company should have a turnover of at least one fiscal year. (Tekes, n.d.).

“Innovation activities refer to all measures employed by the company to develop its products, services or processes, or to acquire new knowledge and competencies required in innovation activities” (Tekes n.d.).

Innovation voucher grant equals 5,000€ + VAT (24%) that make 6,200€. Tekes does not require self-financing, meaning that it is not necessary for the company to invest their own money. On the other hand, purchased expert services can exceed granted 6,200€, though the company should cover the difference to service provider. The voucher is valid for 6 months from the day it was granted. (Tekes, n.d.).

Consequently, innovation voucher might be a useful option for startups with international potential to conduct a research or experiment in order to further develop their product or service.

3.5.2 Tempo

Tempo is intended for Finland based start-ups that aim to expand abroad and whose product or service has a competitive edge in chosen markets. Money is granted for testing business concept and exploring demand abroad, obtaining feedback from potential customers or implementing first demos and prototypes. The maximum amount of Tempo funding is 50,000€ and it covers 75% of the overall project budget, meaning that start-up should provide other 25%. Initially, Tekes pays 70% of the grant and the remaining part for the project is covered based on the costs reported by company after the project completion. (Tekes n.d.)

To meet requirements the company should clearly understand and identify its business model and target market (needs, size and potential customer base). Company should have sufficient resources and private funding for its early stage development. Additionally, start-up team should have versatile expertise and at least one full-time employee, who takes care of business development. (Tekes n.d.)

At application stage, Tekes and company will agree on 2-5 measurable goals to achieve for the funded project. Examples of goals: turnover growth, product features development, new customers, team strengthening etc. (Tekes n.d.)

Tempo funding covers salaries and professional services (if owners' holding is at least 10% it is possible to pay 3,000€ for owners' salaries), indirect personnel costs (may not exceed 50% of the salary paid) and purchased services. On the other hand, it doesn't cover costs of company's routine activities, costs incurred in supporting exports or from export marketing and direct investments in the construction of a distribution channel. (Tekes n.d.)

3.5.3 R&D and piloting

Is intended for startup companies registered in Finland that have already tested the functionality of their product or service concept and aim to expand to the export markets. Money is granted for developing the product or service, testing and demonstrating functionality through a pilot or creating new knowledge and competencies. Tekes n.d.)

3.5.4 Young innovative companies

Is intended for start-ups seeking rapid international growth. Companies should meet specific criteria such as: having a top team, being internationally competitive, having working business model and great

product or service solution and being able to attract venture capital. Tekes n.d.)

The funding consists of 3 phases. The first one is intended to fasten growth and increase competitiveness in international markets, provide investments in sales and marketing as well as strengthen the start-up team. Initially, the company receives 250,000€ grant. Next 250,000€ company gets on second phase which is intended to speed up the business' global growth. On third stage company receives a loan of 750,000€ for proving the sustainability as well as accelerating the growth with funding from public and private sources. Tekes n.d.)

3.6 Other public sources

Public business incubators and accelerators, like Spinno and NewCo, provide subsidized expert services. ETE Center (ELY) consult start-ups as well as provides development grants (though granting varies around Finland and is very limited in Helsinki area). It is possible to receive salary support for employing unemployed persons which covers approximately 30% of employee's salary. F.E.C. is an employment traineeship program. Additionally, there are plenty of EU funding and programs (e.g. CreatiFI, Odine etc.) for specific sectors. (Maisala 2017)

3.7 Private financiers

3.7.1 Venture capital

Venture capitalists are professional asset managers and venture capital is financing provided to startup companies and small businesses that are believed to have a long-term growth potential. Risk is typically high for investors, on the other hand venture capitalists usually participate in board of directors and have a say in company decisions. Venture capitalists mainly make later stage minority investments (venture investments) or expansion majority investments (buy-outs). (Investopedia n.d.)

According to Maisala (2017), Finnish VCs investing in tech are:

- Less than 500,000€: Superhero Capital, Vision+, Butterfly, Vendep
- 500,000€ - 1,000,000€: Lifeline Ventures, Inventure, Open Ocean
- More than 1,000,000€: Conor, VNT Management, Industry Investment.
- Corporate VCs: Reaktor Ventures, Fonecta, DNA, Fortum.

3.7.2 FiBAN – Finnish Business Angels Network

FiBAN does matchmaking for startups and business angels, provides trainings and events as well as represents interests of private investors. It is the largest business angel network in Europe, has more than 580 members and has invested around 37,000,000€ in 322 startups in 2015. Before applying to FiBAN, it is important to submit application to Gust: <https://gust.com/organizations/fiban>. (Oker-Blom 2017)

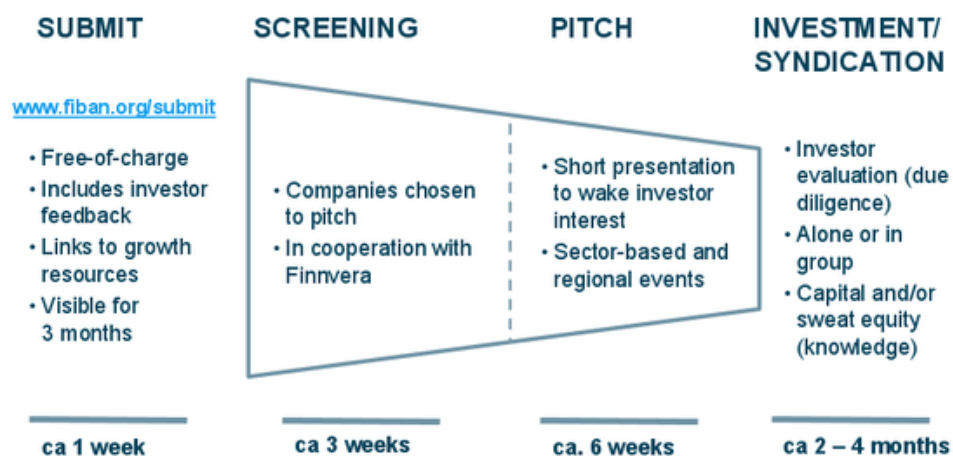


Figure 10. FiBAN application process (Oker-Blom 2017).

3.7.3 Crowdfunding

Crowdfunding utilizes vast networks of people through social media and crowdfunding websites bringing investors and entrepreneurs together. It allows large number of individuals to support a new business venture investing small amounts of capital. (Investopedia n.d.).

Finnish companies raised 26,000,000€ through crowdfunding in 2015 (Jan D. Oker-Blom, n.d.).

Typical forms and services available for start-ups in Finland (Maisala 2017):

- Perks: get something “invaluable” in return, e.g. t-shirts (Mesenaatti.me).
- Pre-order: sell products before they exist (Kickstarter, Indiegogo, FundedByMe).
- Microloans: private loans without collaterals (Fundu, Yrityslainat, Invesdor).
- Equity investments: “mini business angels” (Invesdor, FundedByMe, Kansalaisrahoitus).

3.8 Fundraising requirements

Angel's investment assessment goes deeper compared to the assessments of traditional financing providers in terms of the search process, securities, capital and interest expectations. The emphasis of such evaluation is on growth potential and prospects, instead of financial situation and solvency. (Etula, 24.)

In other words, being prepared for business angels' requirements will be mostly sufficient to meet criteria of other financial instruments and institutions. Additionally, figuring out all factors asked by business angels will be beneficial to a start-up even without fundraising.

Assessment of target company by angel investors according to Etula (2015, 32-43):

- Team.

Angels look for highly motivated people with business know-how and ability to impress investors, partners and customers. Previous failures, e.g. bankruptcy, is less relevant due to possible gained experience. The team should be well structured and balanced, e.g. co-founders should distribute ownership based on their roles and responsibilities, rather than on personal relationships. The perfection level of a team can be evaluated on the basis of eight factors: Will, Know-how, Courage, Relationship Network, Marketing Spirit, Learning Ability, Reliability and Complementarity.

“According to studies conducted by FiBAN, business plans have to be changed more than six times after a financing decision before the right model is found. If the company does not have a good team carrying out the new plans, the investor has invested in "vaporware".”

- Market opportunity.

Market opportunity can be divided into five areas: market size, market niche, potential turnover in 5 years, the competition situation and market traction (is it the right time for technology?).

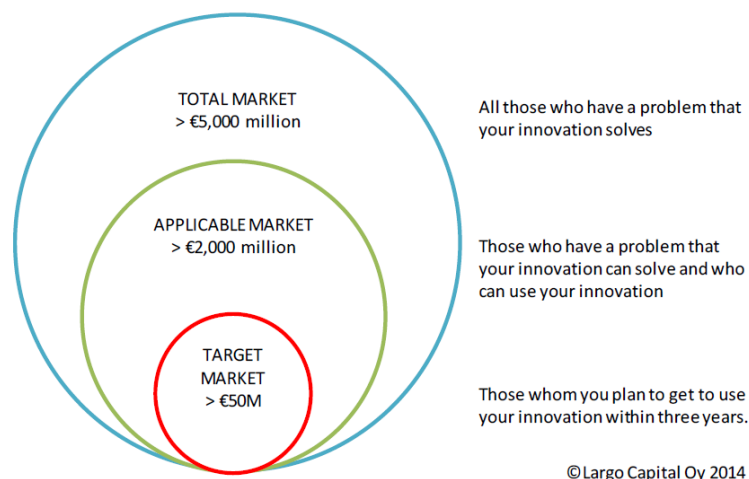


Figure 11. Sizes and definitions of various types of markets (Etula, 36.)

– Competitive advantage.

A market competitive advantage can be estimated by means of IPR protection, traceability of the solution, sales channels (e.g. key distribution channels, waiting periods, exclusive rights, etc.), operating and earnings models.

– Product/service and technology.

Three key factors of product/service development are recognizing customers' problems, creating added value for customers, and scalability (what are potential bottlenecks in the production or distribution chains?).

– Attractiveness of investment.

Attractiveness of investment can consist of five areas: impact of investment (is technology improving people's lives?), leverage of financing (is investor's capital the only financial instrument attracted by a start-up?), financing need in the future, suitability to investor's portfolio and exit potential.

– Current achievements.

Describes how company has been doing before attracting new capital. The current situation and achievements of a start-up can be analyzed in terms of marketing, sales, product readiness level, agreements and cash.

3.9 Roadmap of funding

Tuomas Maisala (2017) emphasized on importance of initial roadmap for funding a start-up company. On the other hand, presence of such plan

doesn't mean that it should be strictly followed. It was advised that company creates initial roadmap and seeks for expert feedback. Then starts operating with smallest required amount of funding to create a minimum viable product. And when ramping up, focuses on cashflow calculation.

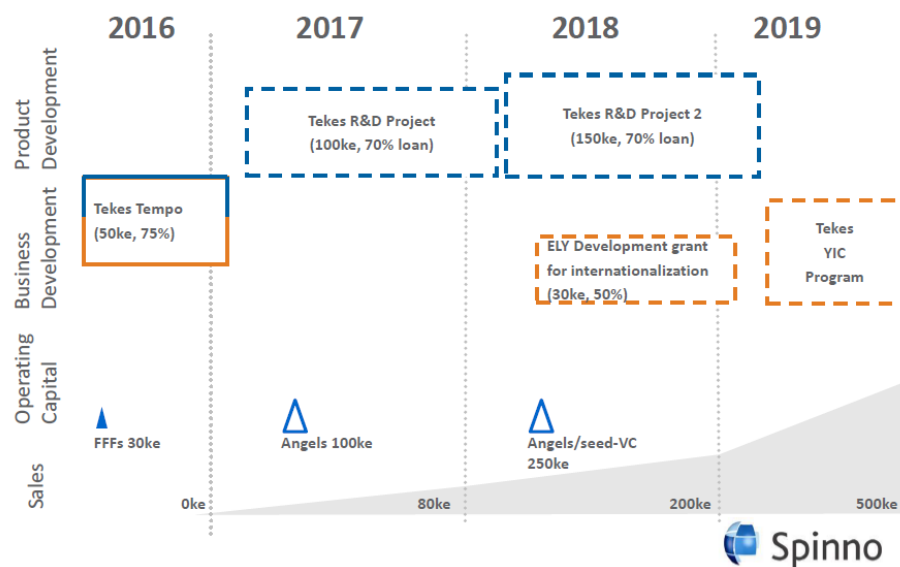


Figure 12. Initial roadmap of funding (Maisala n.d.)

3.10 Useful links

Start-up company valuation tool: <http://angeltool.org/#/new>

An example of a shareholder agreement can be found at www.seriesseed.fi or at: www.eban.org/about/memberarea/

The list of required documentation for business angel can be found here: <http://etula.fi/en/documentation-required-investment-process/>

List of country specific business angles networks can be found here: <http://www.eban.org/about/find-a-member/>. It is recommended to know whether the country has valid tax incentives to support start-up companies or angel investments.

4 E-BIKE MARKET

4.1 Introduction of electric bicycle

Bicycle itself is considered to be a great urban transport. Especially for residents of big cities and metropolises. The one can quickly get to his/her place of destination. Traveling brings a lot more fun than regular bus or car trips. The person leads an active lifestyle, stays in fit. At the same time, the bicycle is accessible to everyone and is easy to operate.

On the downside, bicycles might not be used as a primary commuting transport if the route requires too much efforts when climbing hills or riding against headwind. Commuters, especially those traveling to their workplaces or students, might reject cycling because of tiredness and sweat.

This problem is partially solved by electric bicycles, which assist cyclist during pedalling. E-bikes help drivers to easily conquer hills and headwind. Their main benefit is effortless and comfortable riding experience. This makes electric bicycles relevant especially to commuters who live in big cities and lack exercising (e.g. office workers, students, elderly people).

There are several market opportunities distinguished which include e-bikes as commuting (or mobility) devices, for recreational purposes (e-MTB and baby boomers segment), luxury segment, e-bike-sharing programs (like the one seen in Denmark or Barcelona), delivery fleets and police units. (Navigant Research 2016, 51.)

4.2 Overview of electric bicycle market

E-bikes are highest selling electric vehicles on the planet. In 2016 annual sales of e-bikes were 35 mn units, and they are expected to increase to 36,3 mn units in 2025. Meanwhile, global e-bike sales in revenue will grow 55% from \$15,7 billion to \$24,3 billion during same period. (Navigant Research 2016, 1.)

According to these values from Navigant Research (2016, 1), during the forecast period (2016-2025), the global e-bike market is projected to grow at only 0.4% compound annual growth rate (CAGR). On one side, this rate is not significant, but it is important to understand the whole picture. The key point here is in a structure of e-bike market. The one can name 2 primary e-bike segments: Li-ion battery segment and Sealed lead-acid (SLA) battery segment.

Sealed lead-acid (SLA) batteries continue to represent the largest segment of e-bike sales due to their low cost and popularity in China. And China

accounts for 90% of all electric bicycles sold in the world. However, the market share of this chemistry is expected to decrease significantly over the next 10 years due to the inherent environmental and performance advantages of Li-ion batteries. (Navigant Research 2016, 1.)

Consequently, slow-growing worldwide CAGR is expected to be largely due to China's anticipated decline in annual unit sales (-0.8% CAGR). Annual sales of total e-bikes in China, are expected to decline due to market saturation and new bans on e-bike use in large areas of major cities such as Beijing, Shenzhen, Shanghai, and Guangzhou. Yet, the Li-ion e-bike segment in China is expected to grow considerably over the forecast period due to strong government support for the technology and decreasing Li-ion battery costs. (Navigant Research 2016, 1.)

Excluding China, the global e-bike market is expected to achieve strong growth of 8.2% CAGR during forecast period. Sales are rising from 3.3 million annual unit sales in 2016 to nearly 6.8 million units by 2025. (Navigant Research 2016, 2.)

To sum up, the main trend is continued growth of Li-ion battery segment in all markets.

4.2.1 European Union

In 2016 there were 1.6 mn e-bikes sold in the European Union (Statista n.d.).

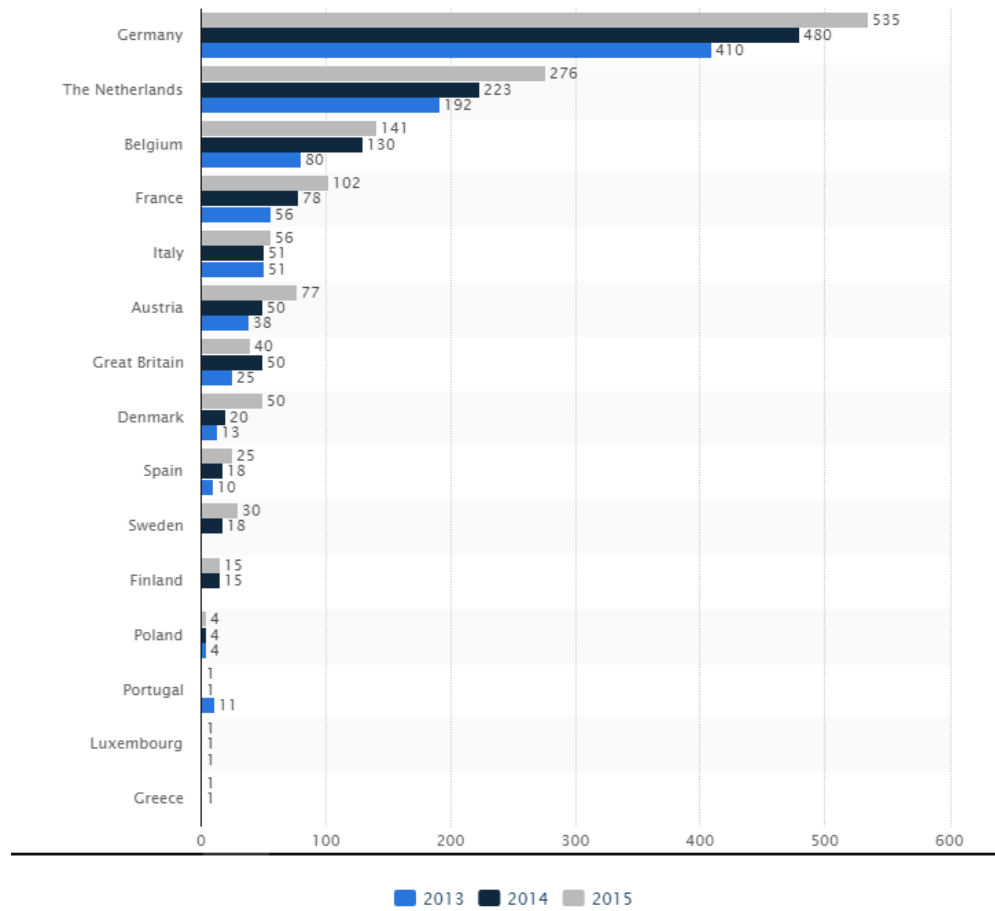


Figure 13. Number of electric bicycles (in 1000 units) sold in the European Union in 2013, 2014 and 2015, by country. (Statista n.d.).

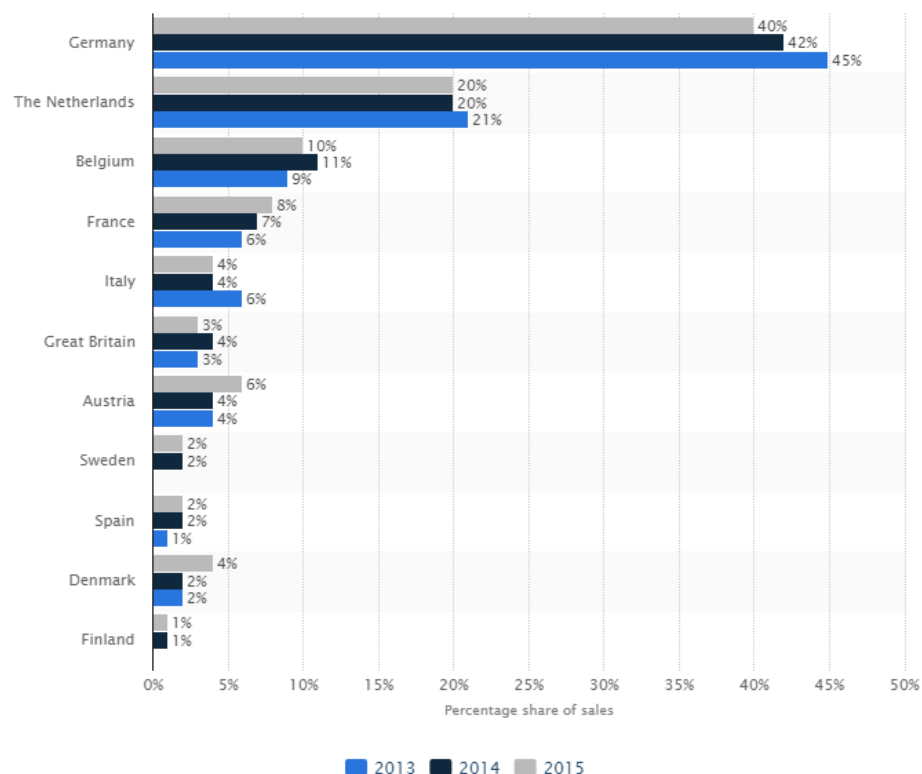


Figure 14. Distribution of electric bicycle sales in the European Union between 2013 and 2015, by country, in percent (Statista n.d.).

Claudia Wasko, General Manager of Bosch eBike Systems – Americas states: “Eventually, e-bikes will account for one of every three bikes sold in the European Union, a ratio now achieved only in the Netherlands. Until then, we predict that e-bike sales will continue growing at a rate of about 15 percent a year. (Electric bike report, 2016.)

According to Bike Europe (2016), a Dutch industry-association Rai (2015) claims that the average sales price for a new electric bicycle sold at the Dutch IBDs reached record levels of over one thousand euro; € 1,058.

USA is 10 years behind Europe, but following a similar path of growth (Electric bike report, 2016).

4.3 E-bike industry drivers

According to Navigant research (2016, 1), the e-bike industry is driven by such factors as urbanization, battery technology development, improvements of bicycling infrastructure, aggressive city energy policies, and better product offerings (which means lower costs and higher performing products).

4.3.1 Mobility

According to International Energy Agency (2012) by 2035 years, the total number of cars will double, reaching 1.7 billion. Developing countries from Middle East as well as India and China will have the biggest impact on this growth. Such an increase as well as urbanization will lead to serious congestion troubles in most cities all around the world. (CNBC, 2012.)

Traffic congestions consequently result in lower mobility and increased transport costs. Such a situation creates favourable conditions for new urban transport solutions, including electric bicycles.

4.3.2 Energy policies

Based on studies, in 2014 transport sector generated 23% of the CO₂ emissions and 75% of which come from road transport. (International Energy Agency 2016, 38)

Transition to sustainable ways of generation, storage and power utilization as well as introduction of new technologies (e.g. self-driving vehicles) and approaches (e.g. sharing economy) will help to decrease our ecological footprint.

Implementation of these transitions requires certain energy policies that can look as a carbon tax, ban or limitations on internal combustion engines, incentives for EV industry and investments in infrastructure etc.

4.3.3 Health issues

Modern occupancy requires less and less physical activity. People who spend most of their day seated, are at an increased risk for a frightening list of conditions, including obesity, diabetes, heart attack, high cholesterol, high blood pressure, and even cancer. Researchers in a University of South Carolina study found a 64% greater chance of heart disease mortality within 21 years for men who sat 23 hours or more behind the wheel or the TV screen compared to men who spent only 11 hours per week on those seated activities. (Digital responsibility n.d.)

Riding electric bicycle itself is a great moderate exercise and for most of people living in big cities it can become a way to combine daily commutes with exercising.

4.3.4 Technology improvements

Significant innovations in EV industry nowadays come from improving battery performance. Based on the author's research, these elements

could be considered as drivers in battery development: safety, energy density, number of lifecycles before battery starts losing its original capacity, charging times and, obviously, price.

The global trend of shifting to more sustainable energy (e.g. from internal combustion engines to EV) is very advantageous for batteries, because the industry can benefit from mass production and more money spent on R&D. Panasonic, LG Chem, Samsung SDI, SK Innovation and Tesla are strong players on the market. Taking into consideration the rise of interest in electric cars, most car manufacturers also will need join the race. Automakers need to vertically integrate battery production into their manufacturing process to make their EVs profitable. It is stated, that Nissan is actively working on next-gen amorphous silicon (SiO) Li-ion battery and Volkswagen is considering building a multi-billion-euro battery factory as part of a major expansion of its electric-car portfolio. (Electric Vehicle News, 2016.)

Energy density is hot topic as well. There are new chemistries being prototyped, for example, such as lithium-sulphur battery that can have five times the energy density of a typical lithium-ion battery, meanwhile possessing same average capacity loss per cycle. Though it is too early to talk about commercially developed product of lithium-sulphur battery, it's still clear that there is a room to improve existing technology. (University of Cambridge with a reference to Advanced Functional Materials, 2016)

At the same time, electric bicycle industry players are investing into development of motor systems, to improve performance and efficiency. Yamaha, Shimano and Bosch companies heavily rely on mid-drive systems. Though hub motors still remain most common type used.

Startups like Zehus, Vanmoof or Superpedestrian emphasise smart controllers which allow a new level of driving experience and interaction with the e-bike.

4.3.5 E-bike industry stoppers

Nevertheless, in some markets there are restraining forces preventing the growth of e-bike sales: e.g. low consumer awareness, low gasoline prices (e.g. in the USA), a lack of adequate bicycling infrastructure, and high purchase prices compared to traditional bicycles (Navigant Research 2016, 2).

5 PRODUCT IDEA DEVELOPMENT

5.1 Ultimate smart-bike

As it was stated before, according to Eric Ries (2011, 86), many assumptions in a typical business are well-established facts obtained from industry experience or simple deductions. As it was seen from market overview there is a need for e-bikes and the market will continue to grow steadily. Hence it is clear that customers understand the value and are willing to pay for, in our case, commuting e-bikes.

The author obtained relatively profound expertise and understanding of electric bicycle market, particularly in Finland, when working for a Go Double A Oy company that specialises in electric bicycle kits and related services. During author's work in the company, he had a chance to communicate directly with customers and get the feedback from them. This experience helped author to conclude some main assumptions that formed a new business idea.

The core assumption of the new business idea was that a commuting electric bicycle should be developed to an extent where it satisfies main product value - provides a stress-free riding experience, meanwhile eliminating all unrequired specs and features that does not solve any customers' problems. The new product should address common issue of most electric bicycles, which are mainly developed on the basis of existing bikes, where creators are trapped by their own obsolete ideas and approaches.

The primary goal was to develop a commuting electric bicycle which looks like an ordinary bike, has neat wireless design, is comfortable and simple to use. The final product should cost very close to a good brand bicycle.

The name of the e-bike is Model U. "U" stands for "ultimate" and/or "urban". Later the author will address the bike model as a smart-bike, since the emphasis is more on creating a smart bicycle that knows when the rider needs assistance than a regular electric bicycle.

5.2 Blue ocean strategy approach for Model U smart-bike

The main task for the author in utilizing blue ocean strategy in product development of model U was to uncover new market opportunities through simultaneously optimizing the cost structure and creating new value.

To do so the author used the Four Actions Framework and the ERRC Grid tool. This tool helped to better understand which factors in new value

offering could be eliminated completely, or reduced to certain extent. Additionally, the author introduced factors that should be increased or created.

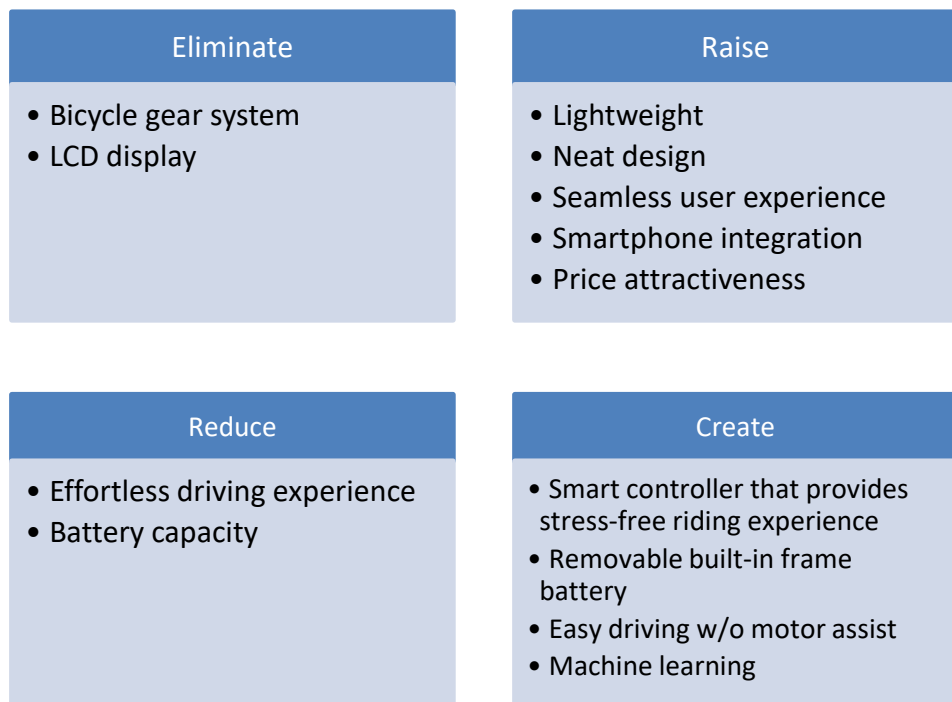


Figure 15. ERRC Grid analysis for Model U.

5.2.1 Factors to be eliminated in Model U product design

Meanwhile in recreational e-MTB bikes the combination of mid-drive electric motor along with bicycle gears allows to generate high torque which is beneficial for off-road usage. On the other hand, when hub motor and gear systems are used in commuter electric bicycle, they happen to duplicate each other since they serve the same function - help commuter drive faster and easier climb hills. Eventually, such duplication leads to the situation where the product gets too complicated and overpriced.

Take this as an example. A bike with 21 derailleur gears and 5 levels of electrical motor assist, have 105 possible “gear” combinations that should be shifted manually. Consequently, it is easy to conclude that only few gears will be used by cyclist during his/her commutes.

The concept behind eliminating bicycle gear systems (e.g. derailleur or hub gears) consists in idea that bicycle drive force can be increased not through changing gain ratio via gear systems, but through adding extra motor assist. This means, that to climb a hill, cyclist doesn’t need to switch to lower gear, the motor will add enough power to maintain constant speed

when pedaling. Eliminating bicycle gearing system will positively affect both product's cost structure, design and maintenance requirements.

Considering stated above, another business idea assumption is to abandon gear systems and the control over motor assist levels to maximize product simplicity and comfort of day-to-day commutes. Instead smart controller which supplies assist to rider based on how much support he needs is introduced as an alternative.

LCD display in most electric bicycles shows traveling information (e.g. speed, range, average velocity etc.) and allows to control levels of motor assist. Since smart controller will automatically adjust power output, the functionality of LCD display is limited to only informational purposes. Considering that smartphone can sync with model U to show all travelling information, the product offering won't include LCD display in order to maintain better look and decrease product cost.

5.2.2 Factors to be reduced in Model U product design

According to Harker (2012), BEBA survey (2012) reports that easier cycling up hills (58,5% of responders) and exercising to stay in fit (54,3%) are the main reasons to purchase an electric bicycle. Meanwhile, most e-bikes assist during all commute, hence providing effortless driving experience. This decreases the exercising benefits of cycling as well requires bigger battery capacity. The core idea of model U is to assist cyclist only when it's needed, e.g. when driving up hills or against strong headwind. Thus, the model U provides stress-free riding experience, which allows cyclists to get more exercise, keeps them from breaking a sweat and optimizes battery usage.

Traveling distance linearly depends on energy capacity. Meanwhile energy capacity directly effects sizes, weight and price. Most manufacturers usually use big batteries with energy capacity over 300Wh. Normally they aim for more than 60km of range on a single battery charge. On the contrary, batteries with high range are bulky, heavy and expensive, meanwhile regular urban commuters rarely travel more than 15 km one way.

According to Jonathon Harker (2012), British Electric Bicycle Association survey (2012) states, that only 2,5% of responders regularly travel further than 50km, meanwhile the majority rides around 10-15km.

Considering that majority of urban commuters rarely travel more than 15km one way, the battery is designed to provide 30 km of range on a single charge. This allows to significantly decrease battery cost, sizes and weight compared to batteries of other e-bike manufacturers.

5.2.3 Factors to be created in Model U product design

Model U will utilize smart controller to compensate the absence of bicycle gearing systems and controls for switching levels of electric assist. Using several sensors that track data during cycling, smart controller will adjust motor assist based on rider's needs and cycling environment. Additionally, smart controller optimizes battery usage, consequently maximum range on a single charge is increased since the motor will work during only a certain time.

Bicycle frame will contain the battery inside, hence providing neat product design. Additional functionality includes battery removability, so users will be able to charge battery wherever it is comfortable without carrying the bicycle to power outlet.

Model U will have only 2 modes: bicycle mode (driving without motor assist) and e-bike mode (driving with motor assist). Considering product's application as well as engine's technical specifications, the model U should be very easy to drive with motor turned off, meaning that engine and extra weight of electrification won't create any significant resistance during pedalling.

As soon as the assumption of stress-free riding experience will be validated, it is possible to implement machine learning algorithms to improve smart controller's performance. In practice this means that controller will predict the need of motor assistance better, providing smoother cycling experience.

5.2.4 Factors to be improved in Model U product design

Absence of gearing systems with LCD display and reduced battery capacity positively affect the weight, design and cost of product. Smart controller will provide a seamless driving experience, meaning that model U will be extremely simple to use. For viewing travelling information, the user will be able to sync his smartphone via app, which substitutes use of traditional LCD display.

5.2.5 Strategy canvas for Model U

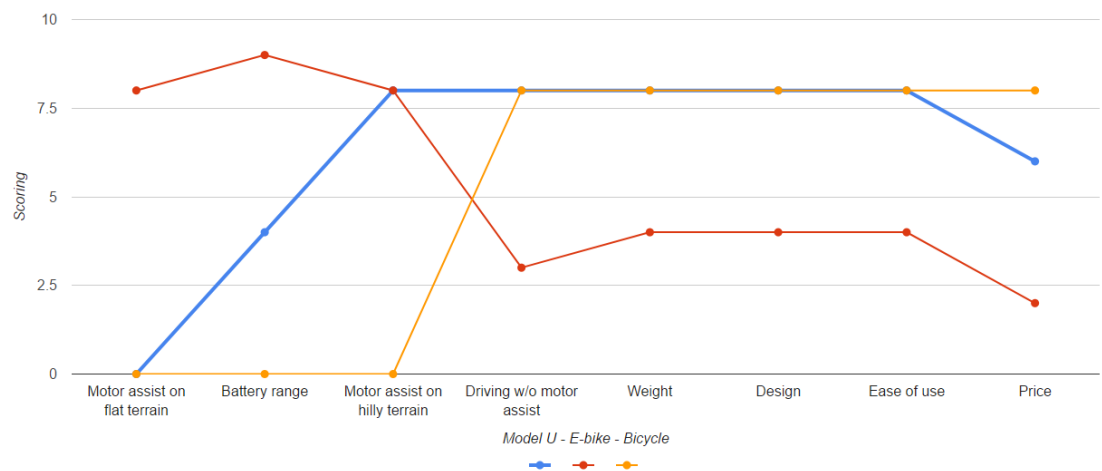


Figure 16. Strategy canvas for Model U compared to e-bike and regular bicycle.

The author made a general comparison of factors relevant to both bicycle and electric bicycle users. These factors included a motor assist on flat terrain, distance to drive on a single battery charge, a motor assist on hilly terrain, driving with engine turned off, weight, design, ease of use and price.

Firstly, we can see that value curves of bicycle and e-bikes are completely opposite. This might explain the findings of consumer survey conducted by the Oregon Transportation Research and Education Consortium (OTREC), which states that the main reason respondents bought electric bicycles was to substitute mainly car trips (Navigant research 2017).

From bicycle value curve, we can see that, obviously, there is no motor support during commutes, but riding bike is great experience due to its light weight, neat design, ease of use and affordable price. On the other hand, electric bicycle assists user during a whole ride, has big battery capacity which allows cycling up to 80 km, but e-bike trade-offs include poor riding experience with engine turned off, increased weight due to heavy batteries and electric components, bulkier design, complicated user experience and significantly increased price.

Model U value curve looks very similar to bicycle value curve. The only noticeable difference is in price, battery range and motor support on hilly terrain. In other words, the price difference is compensated by having a small Li-ion battery and motor, which assists when the cycling load on rider exceeds his specified comfort level.

5.3 Lean start-up approach for Model U

Utilizing the business concept of the lean start-up proposed by Eric Ries and considering outcomes of blue ocean strategy approach, the author summarizes key assumptions that need to be validated:

- Commuting urban smart-bike needs motor assist only to provide stress-free cycling experience by compensating peak stress loads on a rider.
- 30 km of range on a single battery charge in a smart-bike mode is enough for day-to-day urban commutes.
- Regular bicycle gear system can be substituted with electric motor assist to achieve maximum simplicity of operation.

These comprise a set of technical requirements for the product:

- Smart-bike should be comfortable to use in a bicycle mode. The motor should not create resistance during cycling. And the overall weight should not be increased significantly.
- The motor assistance should be enough to help cyclist climb hills or drive against strong headwind.
- Controller should be capable of distinguishing when a rider needs assistance and when he doesn't.
- The built-in frame battery should be easy to remove and charge wherever it is comfortable for Model U user.

5.4 Model U product visualization

Four main focuses of Model U product idea are design, simplicity and price.

5.4.1 Design

The goal is to create a smart-bike which is difficult to distinguish visually from normal urban bicycle. This is aimed to be achieved by using inconspicuous motor (e.g. rear hub motor or friction drive motor like Add-e), built-in frame battery, wireless design and abandoning gear systems.

- Inconspicuous motor

Geared hub motor mounted on a rear wheel looks very similar compared to internal-gear hubs installed on regular bicycles.



Figure 17. Visual comparison of geared hub motor used in Ampler electric bicycle (Ampler n.d.) versus Shimano geared hub (Montague Bikes 2011)

- Built-in frame battery

VanMoof electrified S is a great example of electric bicycle with a built-in frame battery.



Figure 18. VanMoof electrified S e-bike with built-in frame battery (Treehugger 2016)

- Wireless design

All wires of electric components as well as braking cables are planned to be kept inside the frame, so they won't affect the appearance of the smart-bike.

5.4.2 Simplicity

Model U is planned to be designed to work in only 2 modes which are: single-speed bicycle mode and smart-bike mode. Single speed bicycle mode is practically driving with turned-off engine, meanwhile in smart-bike mode the motor assists when load on rider exceeds his specified comfort level. To switch between modes the user should only press the power button.

Before the very first ride, using a smartphone app, customer specifies what is comfortable level of riding for him. After that, whenever he rides and exceeds comfort level, engine starts assisting. Below you can see possible visual example of such programming, where customer specifies his weight and physical form. After that he can choose his comfort level.

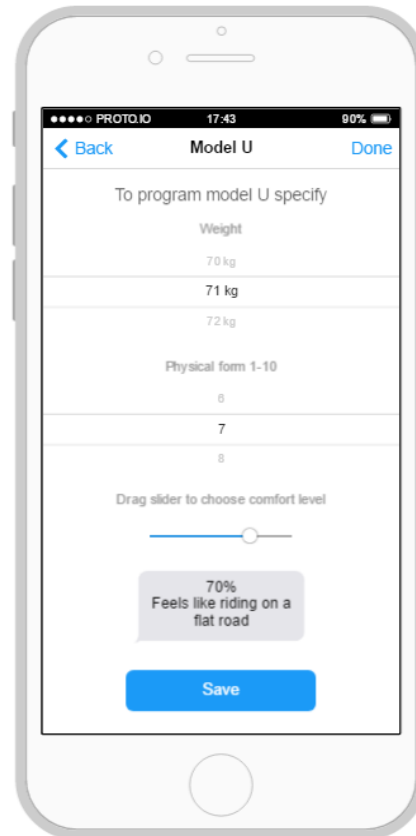


Figure 19. Example of possible programming of comfort level via smartphone (created using proto.io)

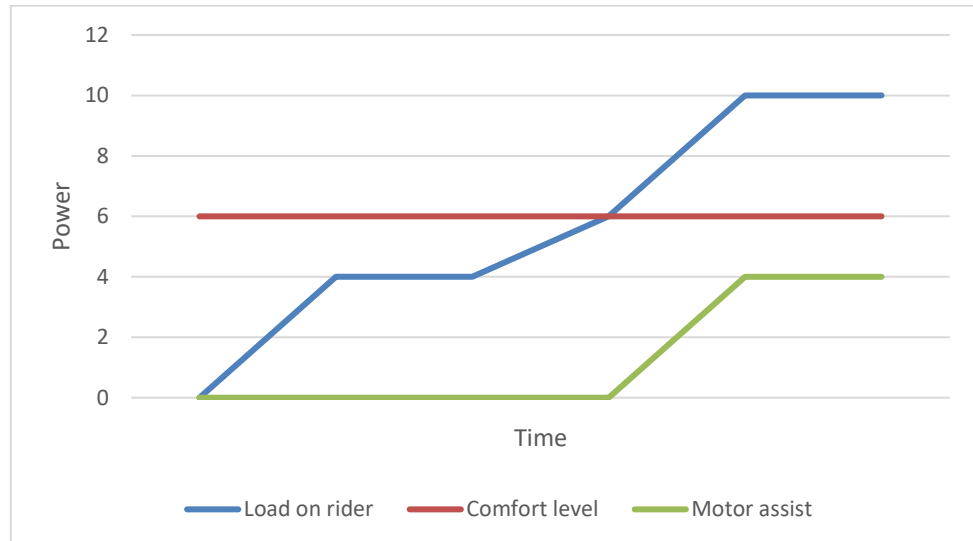


Figure 20. Graph showing that motor assist is applied proportionally when load on rider exceeds programmed comfort level

5.4.3 Price

High e-bike purchase prices compared to traditional bikes comprise a significant factor that limits electric bicycles from further market penetration. The core idea of Model U pricing is that added costs should match added value (comparing to normal bicycles).

As it was stated before the value is a stress-free riding experience during regular commutes. To achieve this the bicycle needs extra functionality such as motor assist and power supply from battery. At the same time bicycle no longer needs gear systems since it's functionality is substituted by engine assist. Smartphone app compensates absence of LCD display. And since motor operates only when rider needs assistance, battery usage is additionally optimized. Due to this optimization and limiting battery range to 30 km of regular urban commutes it is possible to achieve significant battery's cost reduction.

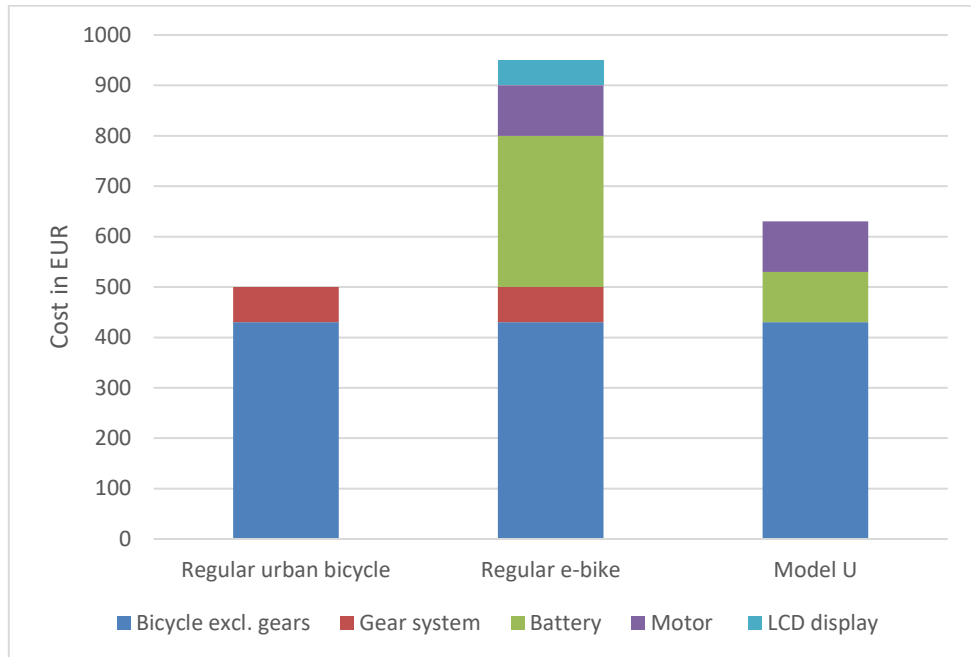


Figure 21. Conceptual cost structure comparison of regular urban bike, e-bike and Model U.

6 BUSINESS MODEL GENERATION

6.1 Business model canvas

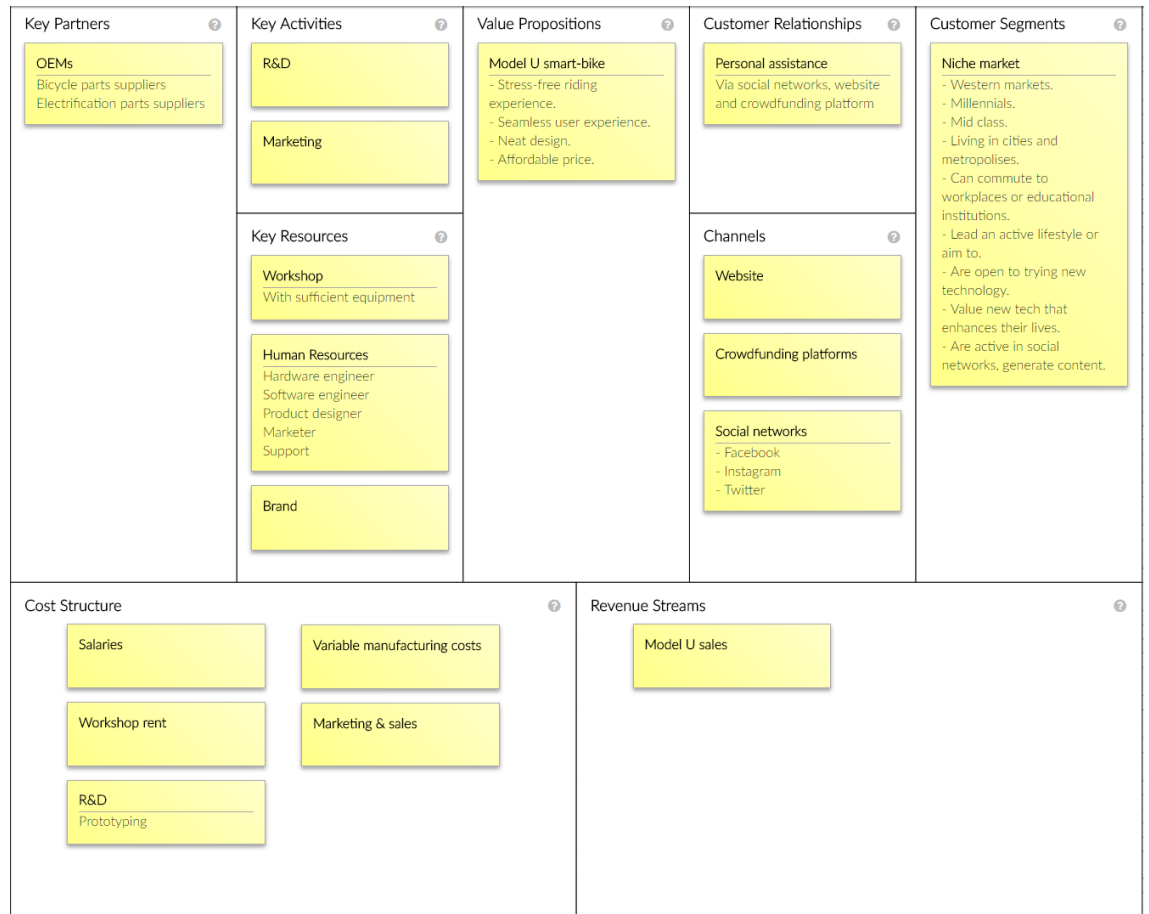


Figure 22. Business model canvas for Model U

6.1.1 Customer segments

After analysing electric bicycle market in general the author can conclude that at the moment e-bikes are primarily a niche market for either commuting or recreational purposes.

The customer segment for Model U smart-bicycle is a niche market of urban commuters primarily composed by millennials.

Customer portrait:

- Western markets primarily.
- Millennials generation.
- 18-40 age.
- Male and female.
- Mid-class.

- Live in cities, especially metropolises.
- Commute to workplaces or educational institutions that are not far away.
- Lead an active lifestyle or aim to.
- Tech lovers: tesla, boosted boards, gopro.
- Are more likely to be early adopters of technology.
- Are open to trying a new technology.
- Value new tech that enhances their lives.
- Like to travel, crave adventure.
- Are active in social networks, have many friends and followers, generate content.
- Choose brands that align with lifestyle with which they identify themselves.
- Word of mouth is very important for them.
- Support brands that stand for more than their bottom line.
- Are willing to purchase a product or service to support a cause they believe in, even if it means paying a bit more.
- Want brands to entertain them.
- Want to participate in co-creation of product and brands.
- Share feedback with companies after a good or bad experience.
- Value accessibility: are looking for brands that are not hard to find and easily fit their lives.

This customer segment wants to:

- Lead a healthy lifestyle.
- Be environmentally responsible.
- Be mobile.
- Have a perfect riding experience.
- Enjoy the commute.
- Ride their electric bicycle as a normal bike without electric support.

This customer segment doesn't want to:

- Break a sweat when arriving to the place of destination.
- Spend money on gas, licenses and parking.
- Adjust to public transport schedule.
- Overpay for costly electric bicycles.
- Their bike to be stolen.

6.1.2 Value proposition

Model U smart-bike is a high-tech solution for short-distance urban commutes. The core product idea is adding extra support for cyclist's stress-free riding experience without sacrificing on design, ease of use and price. Hence value proposition is great design, improved usability and fair price.

6.1.3 Channels

In first stages of business development to increase awareness, help customers evaluate the value proposition, allow purchase and provide after sales services, the company plans to utilize web sales mainly which include own website, e-commerce platforms (e.g. Amazon), social networks and crowdfunding platforms. Delivery will be provided via courier companies.

6.1.4 Customer relationships

In case customer have any product related questions he can receive a personal assistance via web services, such as website or platform support.

6.1.5 Revenue streams

The company plans to generate revenue through selling Model U smart-bicycles as well as accessories.

6.1.6 Key resources

To develop and produce the product the company requires both physical and human resources. For R&D, tests, manufacturing, final assemblies and inventory the company needs a workshop with sufficient equipment. Marketing, sales and support services require an office space. Specialists in electrical and hardware engineering, designers, web-developers, marketers, customer support, lawyers and accountants comprise a company's team. The key intellectual property is a brand, though company plans to patent its core business ideas.

6.1.7 Key activities

Company's key activities in first stage of business development is designing, manufacturing and delivering a product to the market. These includes research and development, production, inventory, marketing, sales and customer support services.

6.1.8 Key partnerships

To assure reliable supplies of components it is crucial to establish healthy buyer-supplier relationships. And considering the business development model most activities are planned to be outsourced to benefit from economy of scale. At first stages, everything that is not related to product development and marketing, e.g. web-development, law and accountant services is planned to be outsourced.

6.1.9 Cost structure

Cost-driven business model is used to create the leanest possible cost structure. Marketing and product development are key company's activities, hence generate most of business costs. Fixed costs include salaries, rents, patents and manufacturing facilities. And variable costs very proportionally to the amount of items produced.

6.2 Business model environment

6.2.1 Market forces

- Market issues.

The main issue affecting the customer landscape is high purchase prices. The future of the electric bicycle market can be summarized by improved design, meaning better and smoother integration of electrification components; and performance improvements for batteries, motors and controllers. Li-ion battery segment will dominate all markets in short-term perspective due to its performance advantages, reliability and environment friendliness.

- Market segments.

According to Jonathon Harker (2012), British Electric Bicycle Association survey (2012) concluded, that the typical customer age range of electric bicycle consumers was over 50-59 years (34,8% of respondents). At the moment generation X is biggest customer segment for electric bikes. Meanwhile millennials segment has biggest growth potential: they are more technology friendly compared to Generation X, though high purchase prices affect them more since they have different product requirements.

“We anticipate we will see further growth in the lower age groups over the coming couple of years” (Harker 2012).

Considering that generation Z is growing up and slowly becomes a potential cycling commuter, this customer segment deserves more attention in following years.

- Needs and demand.

According to Harker (2012), BEBA survey (2012) reports that easier cycling up hills (58,5% of responders) and exercising to stay in fit (54,3%) are the main reason to purchase an electric bicycle.

Among other customer needs and demands for urban riders the author can name saving time and money during commutes and being environmentally responsible. In big cities or metropolises for short commutes electric bicycle might be faster compared to other means of public transportation or even cars. Additionally, the rider doesn't need to spend any money on tickets, gas, licenses or parking.

Most customers wish to use their electric bicycles as normal bikes, meaning cycling without electric support. Hence their requirement is that electrification won't cause any resistance during driving with engine turned off. And since electric bicycles are expensive, tracking systems that help preventing theft are gaining more and more popularity.

– Switching costs.

Brand is extremely important for customers since it assures them in product reliability and safety. Generic e-bike producers might use low-quality components. Worst case scenario in this case can be, for example, malfunction of battery leading to catching fire.

The author's idea is to create a product that strongly differentiates from existing solutions, hence for most of customers it won't be possible to find and purchase similar offers. Though as soon as business model proves its consistency it might be copied by competitors.

Electric bicycle business is very competitive and the author can state that unless the start-up will manage to protect its key innovations which give the product significant performance and price advantages, it will be easy for competitors to replicate the technology at comparable prices. Hence switching costs are low.

Initial advantage of being first market participant with strong brand and continuous product improvement will allow the start-up to maintain its competitive advantage.

– Revenue attractiveness.

As it was stated in needs and demands section, e-bike commuters are willing to pay mainly for assistance during cycling up hills or against strong headwinds. The author will summarize this benefit as "providing stress-free riding experience". Since commuters can get to their places of destination without breaking a sweat using electric bicycle, this allows them to combine regular commutes with moderate exercising. For existing customer segments these main benefits and purchase decision factors compensate emerging e-bike trade-offs: increased product weight, bulkier design, more complicated user experience and significantly increased price. On the other hand, these trade-offs comprise a set of industry

limiting factors that prevent e-bikes penetrating cycling market in other segments and becoming a new standard for cycling.

Significant revenue attractiveness might be achieved through creating product that unveils new customer segments, for example millennials and generation Z.

6.2.2 Industry forces

– Competitors.

Start-up company that introduces its new electric bicycle, faces competition from number of strong competitors. According to Navigant Research (2016, 52) key industry players are: Accell Group, Derby Cycle AG, Easy Motion, Jiangsu Xinri E-Vehicle Co. Ltd, Panasonic, Pedego, Stromer, Yadea Technology Group Co. Ltd. Strong industry participants are: BionX, Bosch, Electric Bike Technologies LLC, Giant Bicycles, GRACE, Haibike, Mahindra, OHM Cycles. Ltd., Prodeco Technologies, Propella, Samsung SDI, Sondors, Superpedestrian, Trek, Vivax and Yamaha.

Their brands, experience in cycling industry, strong supply chains, distribution channels, production and R&D capabilities are competitive advantages that challenge any start-up that threatens their market share. These companies concentrate primarily on traditional customer segments of generation X urban commuters and recreational electric bicycles as well as provide both high-end and affordable solutions.

Part of these (e.g. Accell Group, Derby Cycle AG) are bicycle manufacturers as well, consequently they additionally benefit from economies of scale and scope.

Other part of companies (e.g. Bosch, Yamaha, Panasonic, BionX, Samsung, Shimano) specialize purely on e-bike components or e-drive units, e.g. motors or batteries. This enables the companies to focus their efforts, expertise and resources specifically on developing certain technology and they primarily address B2B markets.

– New entrants.

New entrants in the market are e-bike start-ups that innovate and propose new technological solutions, featuring either improved design (e.g. Van Moof, Ampler), lower prices (e.g. Sondors and Xiaomi) or simplicity of usage (e.g. Superpedestrian, Zehus). These start-ups get considerable media attention, especially from tech news websites (Techcrunch, The Verge, Mashable, Cnet etc) as well as gain popularity on crowdfunding platforms, e.g. Kickstarter or IndieGoGo.

Their competitive advantage is in continuous product innovation and community support from early adopters. On the other hand, due to a lack of manufacturing and distribution capabilities, it takes from several weeks to even months to deliver pre-orders. Reaching the mass market, early and late majority of customers is the main barrier to overcome for new market entrants. Meanwhile, these young start-ups focus on early adopters-millennials, primarily relying on word of mouth (viral marketing).

- Substitute products and services.

Regular bicycles, electric mobility equipment (boost boards, unicycles, Segway etc), two-wheeled motorized vehicles, public transport (bus, metro, commuter trains etc), taxi and cars are main substitute products of electric bicycles for urban commuting. At the moment, regular bicycle is the main e-bike substitute product for most customers since its design, simplicity and price factors outweigh the benefit of stress-free riding experience of electric bicycle. Consequently, e-bike won't become a cycling standard unless potential customers consider added value of electric support matching added costs.

- Suppliers and other value chain creators.

Original equipment manufacturers that provide quality bicycle components (e.g. frames, rims, brakes, tires) and electrification parts (e.g. motors, battery cells, BMS, torque sensors) as well as distribution channels partners are key players in industry value chain.

- Stakeholders.

Talented start-up's team and healthy relationships with OEM suppliers have a core impact on developing new product that meets consumers' needs and requirements. For a newly started company in electric bicycle field distribution and marketing (e.g. media attention) channels play important role to raise awareness among customers, help them evaluate value proposition, allow consumers to easily purchase products as well as provide post-purchase customer support.

Governments have a strong influence on electric bicycle business model due to affecting two main industry drivers: energy policies and cycling infrastructure development.

6.2.3 Key trends

- Technology trends.

Growth of EV industry greatly benefits electric bicycle market due to technology development and increased public, government, and media attention to sustainable means of transportation.

Main technology trend is continued growth of Li-ion battery segment due to the inherent environmental and performance advantages of this chemistry. Li-ion battery cost (USD/kWh) is decreasing, meanwhile battery energy density (Wh/L) is increasing. In 2015 battery energy density attained 295 Wh/L, improving by around 400% compared to 60 Wh/L in 2008. And the battery costs reduced by 73% from USD 1,000/kWh in 2008 to USD 268/kWh in 2015. (International Energy Agency 2016, 12.)

Electric bicycle engines are constantly improving in efficiency, reliability, power to weight ratio, torque output and price. Mid-drive motors are considered as a future hi-end technology considering higher torque output, bicycle gears utilization, improved reliability, and proper weight distribution of electric components. Hence manufacturers like Bosch, Yamaha, Brose and Daum Forschung & Entwicklung GmbH are focusing purely on this technology.

Passive safety during cycling is addressed both by bicycle and electric bicycle companies as well as innovative start-ups.

Growth of battery's energy density and motor's power to weight ratio as well as overall improvements in integration of electrification components will allow to have a great looking e-bikes in nearest future when electric bicycles will visually resemble regular bicycles. Additionally, e-bikes are becoming more intuitive to use, providing seamless driving experience that is very important for commuters. Considering these as well as overall price reduction, electric bicycles are expected to become a new cycling standard.

– Regulatory trends.

Countries are primarily interested in substituting car use in cities with alternative mobility devices and e-bikes are well positioned to be a main benefactor of this trend. Consumer survey conducted by the Oregon Transportation Research and Education Consortium (OTREC) states that the main reason respondents bought electric bicycles was to substitute mainly car trips. German Federal Environmental Agency study unveils that e-bikes are faster than cars for distances of up to 10 km (6.2 miles) in an urban environment. Consequently, if the goal is to reduce greenhouse gas emissions and traffic congestion in a cost-effective way, then countries should incentivize and promote e-bikes. (Navigant research, 2017.)

On the other hand, many public e-mobility strategies in Europe used to focus primarily on cars and do not consider the possibilities that e-bikes offer for making the transport system more sustainable.









COUNTRY	INCENTIVE SCHEMES AT			E-BIKES SOLD IN 2015 (TOTAL)	E-BIKES SOLD IN 2015 (PER 1000 INHABITANTS)
	National level	Regional level	Local level		
 Austria	Yes	Yes (most schemes discontinued)	Yes (most schemes discontinued)	77'000	9.0
 Belgium	Introduction under discussion	Yes	Yes	141'000	12.5
 France	No	One (Corsica)	Yes	102'000	1.5
 Germany	No, propositions rejected	Only pilot projects	Very few	535'000	6.6
 Italy	Discontinued	One (Friuli-Venezia Giulia)	Yes	56'000	0.9
 The Netherlands	Discontinued	Yes (discontinued)	One (Utrecht)	276'000	16.1
 Spain	Yes	One (Basque country)	One (Barcelona)	25'000	0.5
 United Kingdom	No	No	One (Jersey)	40'000	0.6

Figure 23. Country overview of incentives programs (ECF 2016, 9)

Though the trend in European union is slowly changing to supporting e-bikes through incentives. Several e-bike purchase incentives programs were introduced in 2017. For example, France provides \$200 subsidy for e-bike purchases on national level; Oslo, Norway began a \$1,200 incentive program for electric cargo (e-cargo) bikes. ECF estimates that 25% of early e-bike purchases in Austria in 2010-2011 were supported by financial incentives. The increasing number of e-bike incentives as well as developed cycling infrastructure in EU demonstrates the growing

recognition by European policymakers that e-bikes can be a more cost-effective technology to incentivize over EVs within an electric mobility strategy. (Navigant research, 2017.)

- Societal and cultural trends.

Active and healthy lifestyle trend among people of all ages as well as growing environmental consciousness is beneficial for the growth of electric bicycle market.

- Socioeconomic trends.

Key socioeconomic trends are: urbanization, strong middle class in Western countries, growing middle class in emerging markets and population aging.

6.2.4 Macro-economic forces

European economy is in recovery state with expected steady growth ahead. European Union GDP is projected to grow 1,7% in 2017 and 1,8% in 2018. Global growth rates in 2017 and 2018 (excl. EU) are 3,7% and 3,9% respectively. In EU unemployment is expected to decrease from 9,4% in 2017 to 8,9% in 2018. And following years can be characterized with rising domestic demand in European Union. (European Commission 2017.)

Economic infrastructure in Western economies is highly developed. Meanwhile, the prime talents required for R&D and product development are hard to obtain due to strong market competition for top employees and high salaries. On the other hand, innovative companies that are aiming to disrupt the market can interest top talents with impactful mission and future prospects.

7 MARKET OPPORTUNITY

The product is planned to be developed for the Western market, primarily for the European Union. This means that during the first three years all marketing and distribution efforts will be focused on conquering markets in the EU countries. There are several reasons behind this approach:

- The EU market is the 2nd largest market after China.
- It has the highest CAGR rates (9% average till 2025).
- It has a highly developed cycling infrastructure.
- There is a steady economic growth and a rising domestic demand in the following years.
- There are the most developed incentive programs compared to non-EU countries.
- There is unified legislation and technical requirements.

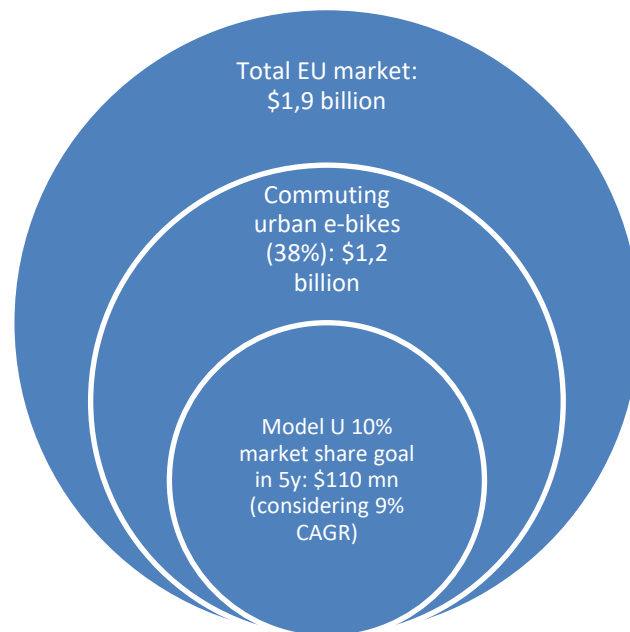


Figure 24. Market opportunity for Model U in the European Union market during the next five years.

7.1 Product development plan

Based on an analysis conducted using the Blue ocean strategy, the Lean start-up approach and the Business model generation the author proposes the following product development plan.

- Create prototype (MVP) to test business assumptions described in chapter “Lean start-up approach for Model U”.
- Conduct market research aiming to evaluate business assumptions.

- Conduct R&D based on research results.
- Crowdfunding.
- Production.

The pre-crowdfunding stage will take six months of product development and crowdfunding campaign preparation. The initial financial requirements which included facilities, salaries, tools, prototyping and other costs are EUR 60,000. The initial financing plan includes raising:

- EUR 15,000 from FFFs and personal savings.
- EUR 45,000 from Tekes Tempo grant.
- In case there is a need for extra funding required, Finnvera as well as FFFs can serve as a backup plan.

8 CONCLUSIONS

The electric bicycle market has a great potential for continuous growth during the next eight years. Electric bicycles are expected to become a new cycling standard due to their advantages compared to regular bicycles and steady technological development.

However, besides all the benefits of electric bicycles, they do have technological trade-offs which comprise main factors that limit the growth of the industry. These trade-offs include: increased weight, bulkier design, less intuitive user experience and high prices. While e-bikes will become an alternative to cars and public transport for many urban commuters, they will remain irrelevant for most bicycle users unless those trade-offs are eliminated.

To address these issues the author proposes his solution by creating a smart bicycle that aims to become a new cycling standard.

The theoretical part of this thesis presented different theoretical concepts related to the research question of this project. The concepts included business model generation, blue ocean strategy, lean start-up approach and funding.

The practical part of this thesis included an analysis of the current state of the e-bike market, the utilization of blue ocean strategy and lean start-up approach in product idea development as well as creating a business model canvas and a business model environment. The author also studied all available types of financiers and financial instruments available for start-up companies in Finland.

As an outcome of this thesis project, the author created a business plan, made some financial calculations for first product development stage and created a financial roadmap. All these are enclosed as appendices to this thesis.

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Appendix 1

MODEL U BUSINESS PLAN WITH FINANCIAL CALCULATIONS FOR THE FIRST PRODUCT
DEVELOPMENT STAGE AND A FINANCIAL ROADMAP

Model U business plan

Ultimate urban electric bicycle

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Description of Business

Company stage

Pre-seed.

Company Ownership/Legal Entity

Finnish Limited Liability Company. Manufacturing type of business.

Location

Prototyping and initial R&D is carried in Ukraine to minimize the costs (salaries, facilities and prototyping).

Mission Statement

Model U mission is to bring motion and exploring to urban commuters. Our vision is creating an ultimate smart-bike that enhances cycling and substitutes regular car or public transport trips.

Market opportunity

Motion, nutrition and sleep comprise the basis of health, well-being and productivity.

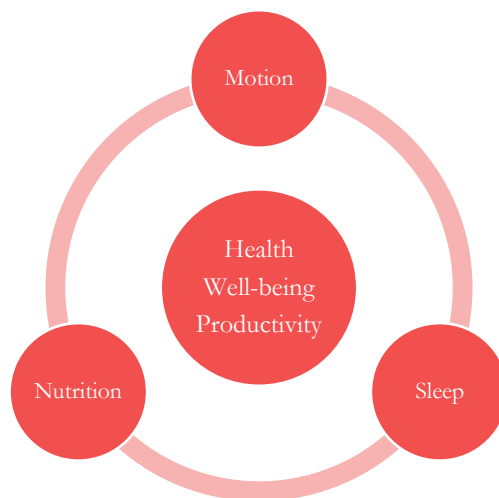


Figure 1 Interconnection of motion, nutrition and sleep

We propose not adding exercising, but implementing it into daily lives of people, e.g. into daily commutes. Main types of motion for daily commutes available nowadays include: walking, running, cycling, e-biking.

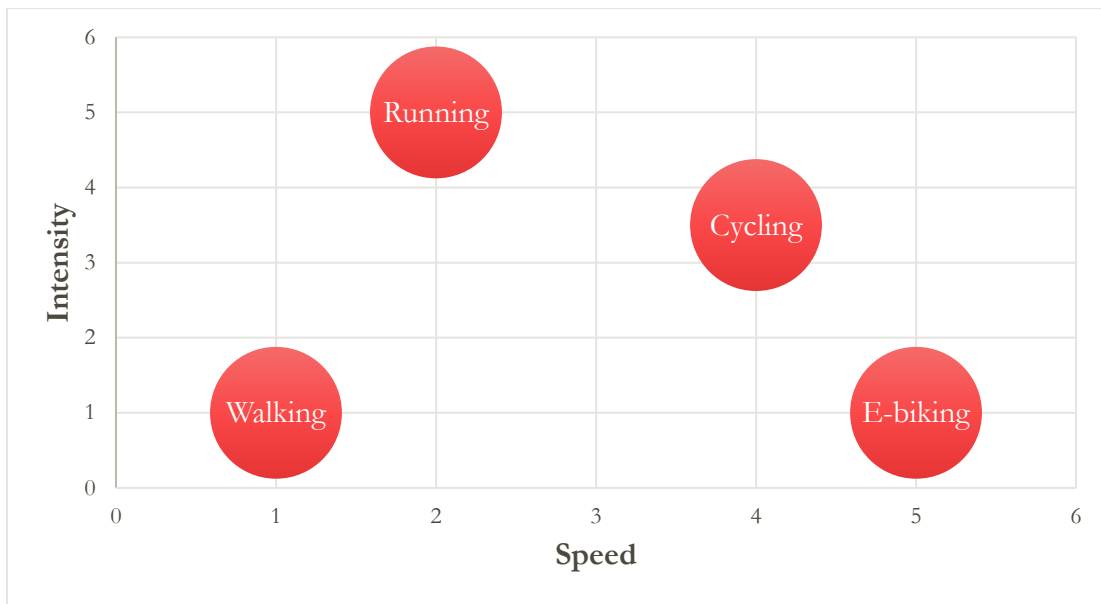


Figure 2 Comparison of main types of motion for commuting purposes

Running and cycling might not be suitable for regular commutes because of high intensity, meanwhile walking is too slow for longer commutes. At the same time e-bikes match the requirements. On the other hand, they are 1) expensive; 2) bad as bicycles. These two factors create a market opportunity.

Product

Our product is Model U – a smart urban bike, which blurs the difference between bicycle and e-bike. It is good both as bicycle and as e-bike. It knows exactly when cyclist needs extra boost. While weights, looks and rides as normal bicycle. Costs under € 1,000.

Our unique selling proposition is: “Ultimate solution for urban cycling. Designed to give a freedom to ride it as a regular or electric bicycle.”

Model U addresses mainly younger customer segments (\leq Millennials).

The core innovation is in a smart controller that supplies assist based on rider’s needs. This means that smart-bike can distinguish when cyclist does need extra motor assistance and when he/she doesn’t.

Our goal is to evolve into a standard bicycle form that is accessible to nearly all bike consumers.

Product assumptions

1. Commuting urban smart-bike needs motor assist only to provide stress-free cycling experience by compensating peak stress loads on a rider.
2. 30 km of range on a single battery charge in a smart-bike mode is enough for day-to-day urban commutes.
3. Regular bicycle gear system can be substituted with electric motor assist to achieve maximum simplicity of operation.

Technical requirements

1. Smart-bike should be comfortable to use in a bicycle mode. The motor should not create resistance during cycling. And the overall weight should not be increased significantly.
2. The motor assistance should be enough to help cyclist climb hills or drive against strong headwind.
3. Controller should be capable of distinguishing when a rider needs assistance and when he doesn't.
4. The built-in frame battery should be easy to remove and charge wherever it is comfortable for Model U user.

Product development plan

Pre-seed stage: 1) company incorporation, 2) validating product assumptions via creating a MVP (prototype) and conducting market research; 3) preparing for crowdfunding.

Seed stage: 1) release of the working prototype, 2) conducting the crowdfunding campaign, 3) further R&D and product development.

Start-up stage: 1) release of the first version of commercially available product, 2) launch of production and sales, 3) international expansion on key EU markets, 4) R&D and product development of the second version.

Later growth stage: 1) further international expansion on remaining EU markets and continuous R&D, 2) release of the second commercially available product.

Financial roadmap

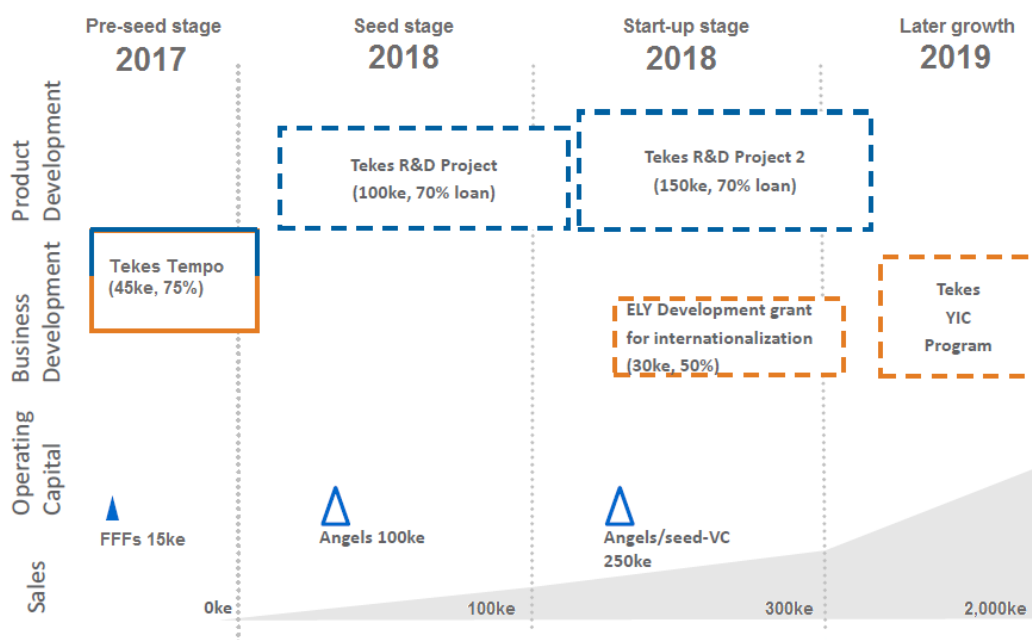


Figure 3 Initial roadmap of funding

Suppliers

Company does not have any agreements with suppliers now. Our current focus is on developing prototype (MVP). All components can be supplied by OEM suppliers, hence prototyping will include mostly assembly and software development.

Revenue

Our main revenue stream will be sales of Model U smart-bikes and accessories.

Manufacturing

For prototyping we need: a workshop, sufficient equipment and components for tests and final assembly.

Components for tests include all electrification components: various engines, controllers, sensors, battery cells, BMS etc. Sufficient equipment includes all tools that are required for assembling the bicycle and electrification components.

Team

CEO – Andriy Sytnyk. Previously had 1 year of experience as a CEO of Go Double A Oy company, which specialized in e-bike kits, accessories and related services, e.g. installation and maintenance.

The team consists of:

- CEO
- Hardware engineer
- Software engineer
- Product designer
- Electrical engineer
- Mobile software engineer
- Tester

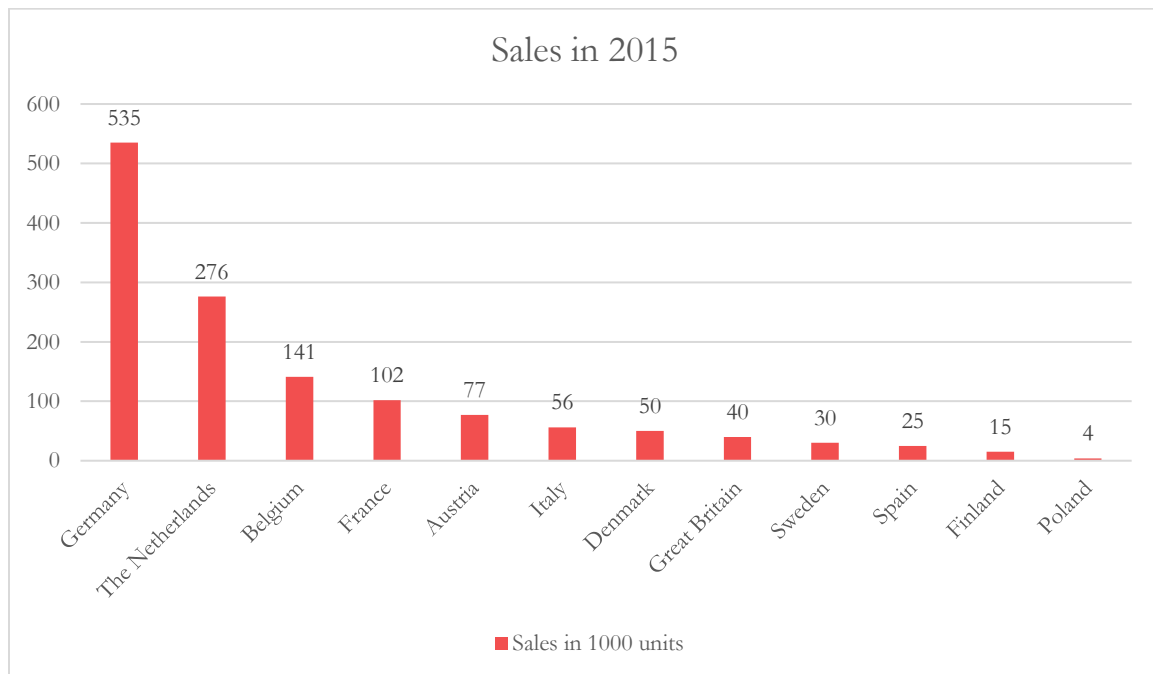
Marketing

Market Analysis

E-bikes are highest selling electric vehicles on the planet: 35m units sold in 2016 (China - 90%). Global sales are expected to increase by 55% from \$15,7b to \$24,3b during 2016-2025.

Model U focuses on EU market. There are several reasons for this:

- Second largest e-bike market: 1,6m units sold; around \$1,9b in revenue.
- Expected average CAGR of 9% until 2025.
- Highly developed cycling infrastructure.
- Steady economy growth and rising domestic demand in following years.
- Most developed incentive programs compared to other non-EU countries.
- Unified legislation and technical requirements.



Market Segmentation

The customer segment for Model U smart-bicycle is a niche market of urban commuters primarily composed by millennials. These are people who: live in cities, are able to cycle to workplaces or educational institutions, lead an active lifestyle or aim to, are open to trying new technology and value tech that enhances their lives. Model U aims to become an alternative not only to cars or public transport, but also to regular bicycles.

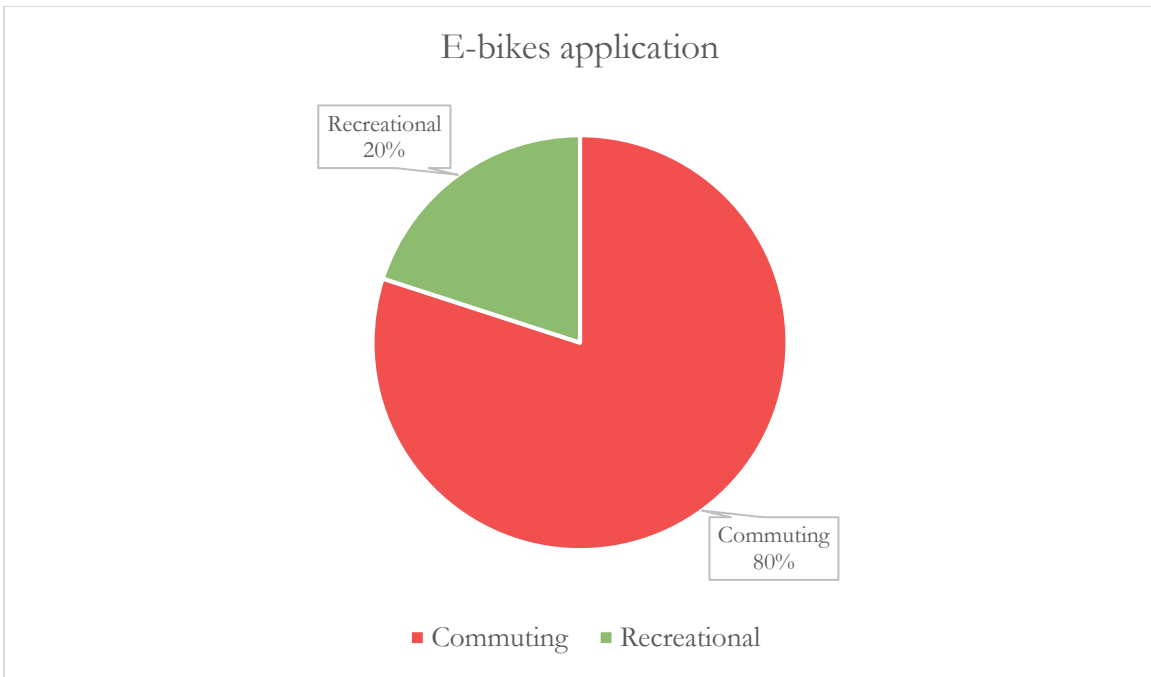


Figure 4 Shows that 80% of e-bikes are used for commuting purposes

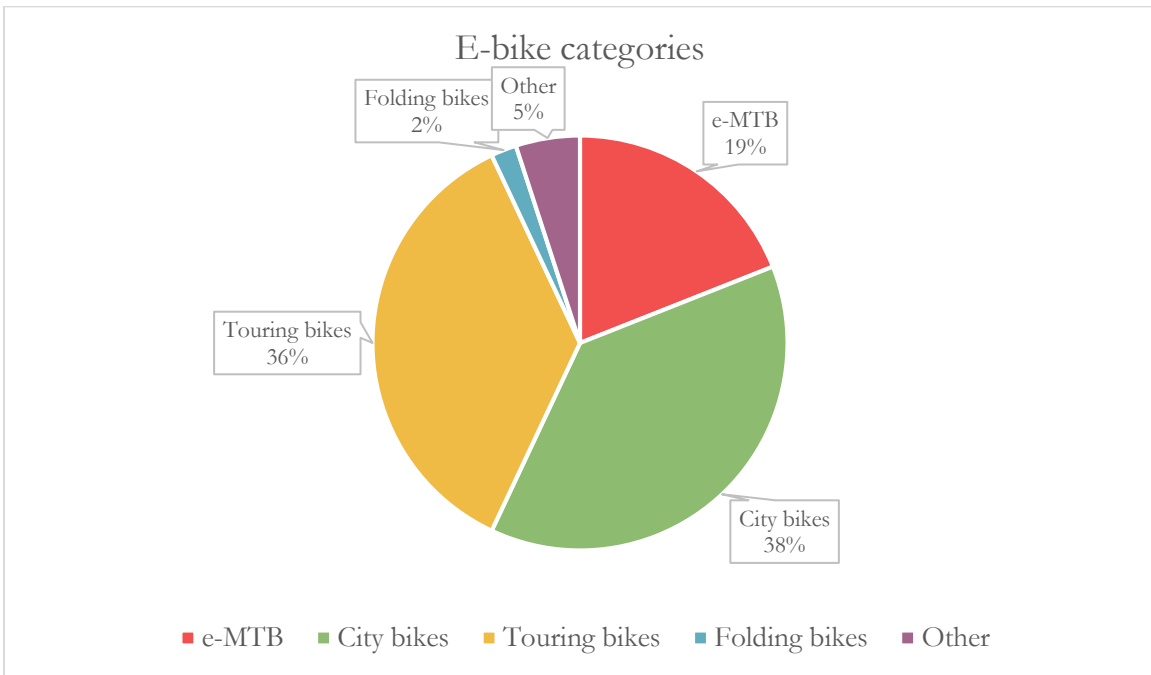


Figure 5 Market shares of e-bike categories

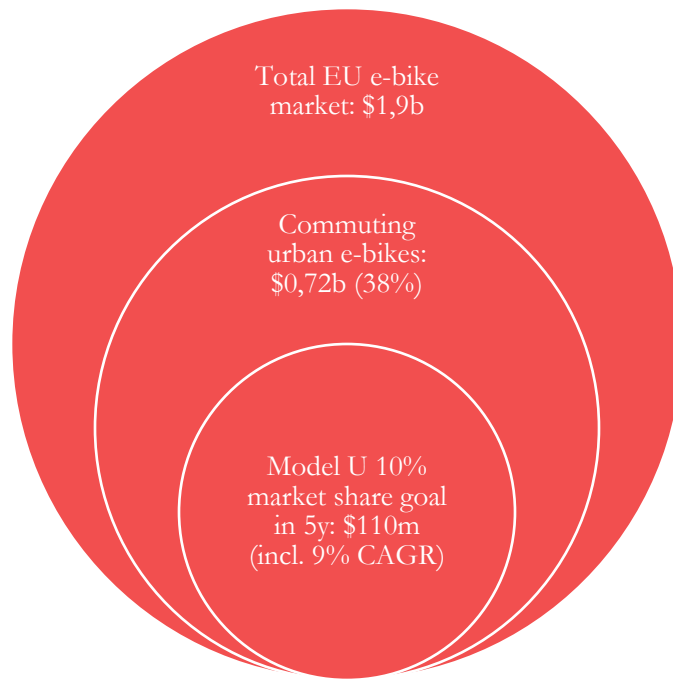


Figure 6 Market opportunity for Model U

Possible positive scenarios that might increase Model U market share:

1. Addressing not only 38% market share of “city e-bikes”, but 80% of commuting segment.
2. Blue ocean of new customer segments, e.g. bicycle riders.

Competition

Primarily we compete with e-bike manufacturers: both strong industry players and new arising start-ups.

Competitors	Strong industry players	Start-ups
Examples	Accell Group, Derby Cycle AG, Easy Motion, Bosch, Giant Bicycles etc.	VanMoof, Superpedestrian, Ampler, Sondors, Zehus, GeoOrbital etc.
Competitive advantage	Strong brands, experience in cycling industry, strong supply chains, distribution channels, production and R&D capabilities.	Propose certain value innovation: design, price, simplicity. Get considerable media or crowdfunding attention. Community support from early adopter.
Weaknesses	“Red ocean” of competition.	Lack of manufacturing and distribution capabilities.
Customer segments	Propose recreational and commuting e-bikes. Provide both high-end and affordable solutions. Mainly orient on older customer segments (\geq generation X).	Primarily propose commuting solutions for urban environment. Focus on millennials.

Appendix

Start-Up Expenses

Business Licenses	0
Incorporation Expenses	330
Bank Account	120
Insurance	300
Rent, 1y	3 600
Heating, electricity, internet	1 150
Furniture and stationary	1 000
Instruments and equipment	2 500
Prototyping	10 000
Patenting	0
Other	1000
TOTAL STARTUP EXPENSES	20 000

Cash Flow

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Starting cash	60000	48700	40400	32620	24820	17040	9440	92240	81020	94820	108600	122400
Cash In:												
Cash Sales									25000	25000	25000	25000
Loan							70000					
Grant							30000					
<i>Total Cash</i>	60000	48700	40400	32620	24820	17040	109440	92240	106020	119820	133600	147400
Cash Out (expenses):												
Incorporation	330											
Rent incl. utilities	400	400	400	400	400	400	400	400	400	400	400	400
Payroll (incl. taxes)	6040	6040	6040	6040	6040	6040	6040	6040	6040	6040	6040	6040
Prototyping	1000	2000	2000	2000	2000	1000	2000	2000	2000	2000	2000	2000
Loan Payments												
Travel	100	100	100	100	100	100	500	500	500	500	500	500
Insurance	300											
Marketing							2000	2000	2000	2000	2000	2000

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Instruments and equipment	2000	500					5000					
Furniture and stationary	890	20		20		20	1000	20		20		20
Phone & Internet	30	30	30	30	30	30	50	50	50	50	50	50
Bank fees	10	10	10	10	10	10	10	10	10	10	10	10
Other	200	200	200	200	200		200	200	200	200	200	200
Variables												
<i>Total Cash Outgo</i>	11 300	8300	7780	7800	7780	7600	17200	11220	11200	11220	11200	11220
ENDING BALANCE	48700	40400	32620	24820	17040	9440	92240	81020	94820	108600	122400	136180