

Design of a Conversion Rate Optimization Tool for E-Commerce

Bachelor thesis for Creative Technology by
Dat Tran
Supervisor: Kasia Zalewska
Critical Observer: Mannes Poel
August 17, 2017

Abstract

Conversion rate optimization (CRO) is a methodology used in E-commerce to increase revenue by optimizing the user experience for maximum purchases. However, this process is difficult for many E-commerce operators. A tool was conceptualized that would make the process easily accessible to most E-commerce operators. In the present paper, the design of this tool is documented up to the minimal viable product (MVP) stage.

State of the art research was done to provide an overview over the current industry practices around conversion rate optimization, the E-commerce market as well as business development in connection with product development. Related products are compared against a preliminary set of requirements. Then, a practical implementation of the Lean Startup framework was formed and combined with other methodologies for the design of a product and the business model around it.

The results of the execution of the methodology are presented. This includes interview evaluations, mockups, a mock sales page, an evaluation of an advertising campaign, pricing considerations and technical product aspects. The iterative design process resulted in a tool that presents an array of potential user experience (UX) changes that shop owners could test. The testing infrastructure as well as the implementation of the UX cases are already in place and therefore the implementation of the cases can be done with very little configuration. Potential users responded positively to the prototype.

The process as well as the product is then critically discussed and a future road map is given. The final design of the MVP is fit for development.

Acknowledgements

No good work is done without collaboration and no collaboration should go without appreciation. Without the help of some key people this project would not have been possible, all of whom I'd like to thank.

Firstly, I'd like to thank Dr. Kasia Zalewska, my supervisor who patiently guided me through the process. Throughout many turning points of this project, she instilled faith in me and my idea and was always helpful and quick in her responses.

Secondly, I'd like to thank Dr. Mannes Poel, my critical observer. Without Mannes' rigorous examination, my thesis would have severely lacked in academic depth as well as critical judgment.

Additionally, I am thankful for my interview partners for openly sharing their practices that provided me with a much more concise understanding of the E-commerce industry and business operations.

Contents

1	Introduction	6
1.1	E-Commerce	6
1.2	Conversion Rate Optimization.....	6
1.3	Challenge and Project.....	6
1.4	Lean Startup framework.....	7
1.5	Report Outline	7
2	State of the Art Research	8
2.1	Overview of the Lean Startup framework	8
2.1.1	The Build Measure Learn Cycle.....	9
2.1.2	The Minimum Viable Product (MVP)	9
2.1.3	Measure & Innovative Accounting	9
2.1.4	Customer Development.....	10
2.1.5	Lean Canvas	10
2.2	Model for Adaption of Lean Startup Principles in Product Development	11
2.2.1	Problem / Solution Fit.....	12
2.2.2	Product / Launch Fit.....	12
2.2.3	Product / Market Fit	13
2.3	Market Research	13
2.3.1	E-commerce Industry Outlook.....	13
2.3.2	E-Commerce Software Ecosystem	13
2.3.3	Conversion Rate Optimization	14
2.4	Opportunity for an E-Commerce Tool	15
2.4.1	Problem Statement (Motivation)	15
2.4.2	Proposed Solution (Value Proposition).....	16
2.4.3	Risk Hypothesis and Market Outlook (Viability)	16
2.5	Related Products	17
3	Methodology	19
3.1	Problem validation	19
3.1.1	Problem Interview Outline and Objectives.....	19
3.1.2	Survey Design	23
3.2	Solution Development.....	23
3.2.1	Stakeholder Analysis 23	
3.2.2	Requirement Analysis	24
3.2.3	Interface Design.....	24
3.2.4	Branding	24
3.3	Solution Validation	25
3.3.1	Solution Interview Outline and Objectives	25

3.3.2	Marketing	27
3.4	MVP Design	28
3.4.1	UX Hypotheses.....	28
3.4.2	Financial Considerations.....	29
3.4.3	Preliminary Pricing Considerations	29
3.4.4	Technical Considerations.....	30
4	Results.....	31
4.1	Initial Lean Canvas and Requirements.....	31
4.2	Problem Validation	32
4.2.1	Interview Evaluation	32
4.2.2	Survey Evaluation	33
4.2.3	Conclusions to problem validation	33
4.2.4	Post Problem Validation Lean Canvas	35
4.3	Solution Development.....	36
4.3.1	Requirement Analysis.....	36
4.3.2	Branding	36
4.3.3	Wireframes.....	38
4.4	Solution Validation	39
4.4.1	Interview Evaluation.....	39
4.4.2	Marketing Campaign Evaluation.....	40
4.4.3	Conclusions to Solution Validation	42
4.5	MVP Design	42
4.5.1	MoSCoW Analysis	43
4.5.2	UX Hypotheses.....	43
4.5.3	Statistical Model.....	45
4.5.4	Class Diagram	46
4.5.5	Stack and Infrastructure	48
4.5.6	Financial Considerations.....	49
4.5.7	Final Lean Canvas.....	51
5	Discussion	51
5.1	Reflection of Methodologies and Process	53
5.2	Future Roadmap.....	54
5.3	Conclusions to Research Questions.....	53
6	References	55
7	Appendix	55

1 Introduction

This chapter provides a short thematic introduction to the subject of E-commerce, conversion rate optimization and the challenge that led to this bachelor project. The chapter will conclude with the outline of the project as well as the limitations.

1.1 E-Commerce

E-Commerce has grown to a behemoth of an industry with a market size of 1,9 Trillion Euros in revenue globally [1]. With a steady growth averaging 14% [1] the past three years, e-commerce is the fastest growing industry in Europe [2]. As more users are flocking from traditional retail to E-Commerce, global revenue is expected to double by 2020 [14]. Accompanying this growth, there has not only been an increase in the diversity shop software [17] but also supporting tools that facilitate sales, marketing, accounting, inventory management, design and fulfilment.

1.2 Conversion Rate Optimization

Conversion rate optimization (CRO) is a system that aims to increase the percentage of visitors to a website that convert into customers (conversion rate) [16]. It can be used as an overarching indicator to drive many different changes to an e-commerce shop, especially marketing and UX changes. The main method for CRO is to make hypotheses about potential changes to then test variations and track them to make statistical conclusions about these changes. CRO is a vital aspect of e-commerce strategy because it can increase revenue drastically. The following are examples of hypotheses that could ultimately increase the conversion rate:

- I. "Changing the 'add to cart'-button from the current color to red will increase the 'add to cart'-rate."
- II. "Add graphical security certificates to the header of the page will decrease cart abandonment."

1.3 Challenge and Project

However, the problem is that setting up different tests for UX changes is an arduous process. Shop owners often need to use external tools, that are not directly integrated within their e-commerce software to track the effects of their variations. This process can be very challenging for various reasons. First, coming up with hypotheses for UX changes depends usually on usability tests or UX changes that other companies have made. Secondly, the technical implementation for testing can require changes in the source code of product pages to fit tracking codes, design changes and distribution of these variations [16].

This project outlines the design a tool that attempts to solve these problems for shop operators: a tool that proposes hypotheses for UX changes that also implements these changes with very little configuration as well as the testing infrastructure to collect the test result data.

This tool would not have any users if it wasn't tied in an existing E-commerce ecosystem as a plugin because most shop operators use widely accepted E-commerce software solutions. Without

users and data this tool could not thrive and thus the most promising application of this tool would be the distribution as a commercial plugin. This means the tool is a product and the terms will be used interchangeably throughout the thesis. Thus, the process of building this tool leans heavily on an adaption of the Lean Startup framework, a business framework for new product development [11]. The Lean Startup framework draws much of its metaconcepts from User-Centered Design and ensures that design choices made throughout the process focus on the user's value.

The goal of the project will be to validate the problem, iteratively design a solution, validate the solution and design the minimal viable product (MVP).

The scope of this project is to arrive at a design for a MVP. The design choices are justified by the insights gathered from the application of the Lean Startup framework in iterative design stages.

Finally, an analysis of future recommendations is given using data gathered during the design process. The project is guided by the following research questions:

- RQ1: How can this idea be validated using the Lean Startup framework?
- RQ2: What does the framework for the business model for this solution look like (Lean Canvas)?

1.4 Lean Startup framework

Lean Startup is a methodology for developing products with the aim to cut development cycles by combining hypothesis-driven experimentation, iterative design processes, and validated learning [11]. The main hypothesis behind the Lean Startup paradigm is that startups can reduce market risks and leap ahead in finding a product market fit through a combination of iterative design stages that are sensitive to customer feedback. The basic business assumptions are then validated and combined in a framework of hypotheses for further testing.

1.5 Report Outline

This section contains the outline of the thesis.

Chapter 2 starts out with the state of the art research about the Lean Startup framework, a model of adaption for this project, market research, a detailed description of the opportunity for this product and related products. Chapter 3 contains the methodology for the problem validation, solution development, solution validation as well as the MVP design. Chapter 4 documents the results of the execution of the methodology Finally, chapter 5 discusses the methodologies and results, a future roadmap and the conclusions to the research questions.

2 State of the Art Research

This chapter contains the state of the art for the relevant thematic themes of the project. It starts with an overview of the Lean Startup framework in which the main concepts are summarized. The chapter continues with a practical application of the Lean Startup framework relevant to this project. The chapter then goes on about the E-commerce industry as a whole and how CRO plays a role in it. Finally, the chapter ends with an outline of the opportunity of this tool as well as related products.

2.1 Overview of the Lean Startup framework

In recent years, a new business paradigm has taken over innovation management and startup culture. This set of methodologies is now being taught in universities and business summits. “Lean Startup” is a paradigm that can make the process of developing a new product less risky. It favors experimentation as opposed to elaborate planning, customer feedback over intuition, and iterative design over traditional “big design up front” development [13]. Large companies such as GE and Intuit have adapted the Lean Startup framework for small agile teams to pursue new business opportunities.

Traditional methods of business development dictate every business to start with a business plan – a ‘report’ that includes the problem, the opportunity and the solution that the new company will provide. Additionally, it includes a five-year forecast for cash flow, balance sheets and revenue. This report can then be taken to banks or other investors for funding [13]. However, the idea behind a business plan and large up-front development of an idea are damning: 1) Business plans rarely depict the first contact to the market accurately. 2) Five-year operational plans are inherently speculative since they are based on uncertain future events. 3) The longer time is spent on developing a product, the less flexible the product becomes for pivotal points that are a result of customer feedback. Subsequently, more than 75% of startups traditionally fail [13].

The ‘Lean Startup’ methodology takes a radically different approach to business development. First, entrepreneurs must accept that all their assumptions are nothing more but good guesses. These guesses can be formulated as hypothesis that can be tested. Rather than forming an extensive business plan, the entrepreneur compiles all these hypotheses in a framework called the ‘business model canvas’ [11]. Second, Lean startups deploy a “get out of building” approach called customer development to test their hypotheses which was first conceptualized and written about by Steve Blank, a successful Silicon Valley serial-entrepreneur. This is essentially a poll of potential users, purchasers, and partners for feedback on all elements of the business model, including features, pricing, distribution channels and growth strategies [13]. Third, Lean startups use agile development for their technical implementation. Agile development originated in the software industry and describes an iterative and incremental development process of the product largely influenced by customer feedback [13]. The core tenants of the Lean Startup framework include:

- The Build Measure Learn Cycle
- The Minimum Viable Product
- Measure & Innovative Accounting
- Customer Development
- The Lean Canvas

2.1.1 The Build Measure Learn Cycle

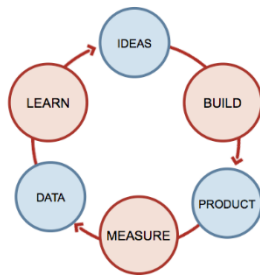


Figure 1 Illustration of the validated learning concept

For anything that a customer comes in contact with, learning the customer's preferences about that point of contact is crucial. The emphasis here is on 'learning'. Validated learning means to base the least amount of decisions on assumptions but rather test them as far as possible [11]. The Lean Startup interprets this learning process to be cyclical (Figure 1) in which every decision can lead to an outcome that can be measured and learned from.

2.1.2 The Minimum Viable Product (MVP)

The idea behind deploying a product that does not have the full array of desirable features yet is to gain as much insight from the customer as possible. It is the fastest way of going through the build-measure-learn feedback loop and therefore a crucial exercise of validated learning. A main rule behind building an MVP is to remove any features, process or effort that does not contribute directly to the learning the entrepreneur seeks [11]. Since an MVP is an elemental point of contact with the customer that can establish a vast amount of useful data it is a learning milestone.

2.1.3 Measure & Innovative Accounting

According to the Lean Startup principles, a startup has two constant priorities:

- Assessing the businesses' current situation rigorously and truthfully
- Design experiments for further testing of hypotheses

This again shows the stark focus on empirical learning for business choices that echo throughout the theory. Innovative accounting refers to a systematic approach to measure progress and achievement of actual validated learning. Innovative accounting is broken down into three steps:

- Gather user data after the release of the MVP to assess the company's position
- Shift the efforts slightly from the baseline towards the ideal
- While shifting, the company reaches a decision point: pivot or persevere

IA forces the startup systematically to push towards a direction. If the company is making good progress, the startup should persevere with the assumption of the baseline. If it isn't, the company has to pivot into a direction that the acquired data has suggested. If after this pivot experiments are overall more productive, the pivot was successful [11].

2.1.4 Customer Development

Customer development (CD) makes up a fundamental pillar of the Lean Startup framework and describes the methodology behind forming and testing hypotheses. It was first introduced by Steve Blank and was designed to guide the path to validate and execute scalable business models [11]. The basic premise behind Blank's model of customer development is that there are no facts and conclusions to be made "within the building" which means that the companies have to get out and build a relationship with potential customers to better understand their needs. Blank criticized Cooper and Kleinschmidt's [26] model of new product development (NPD), stating that it companies dedicate an elaborate planning and development process to build products that might not be well received at all. Blank's customer development method is therefore a way to radically cut down risks when starting new ventures [13].

CD is a way of emulating the scientific process for business. Different business assumptions, such as "Ecommerce shop owners see the value of split testing", can be formed into hypotheses to be tested. These experiments are usually a process of evaluating customer feedback. There are many different types of feedback that a startup can receive from potential customers. Most of them can be categorized into qualitative, quantitative feedback or a mixture of both:

Qualitative

- Interviews
- Reviews on other products that validate the problem
- Articles from the industry

Quantitative

- Monetary cost-benefit analysis of the product
- Surveys
- Ratings on products that fulfill a similar purpose

This feedback is then evaluated to either support or reject the hypothesis. According to the results it can be then concluded to reject or validate the hypothesis. Finally, new hypotheses can be formed based on the results of the previous one.

2.1.5 Lean Canvas

The Lean Canvas (Figure 2) is a framework to combine hypotheses of a business model to test and validate a business model, measure progress and communicate learning with internal and external stakeholders [23]. It was conceptualized as an alternative to traditional business plans that often times take weeks to put together because of the extensive requirements to include forecasts for cash flows and balances for years ahead of development. The main is that it should only take a few hours to put together and that the statements are hypotheses that can easily be verified.



Figure 2 An empty depiction of the Lean Canvas

It captures an overview of the following elements of a business model:

- Problem: The problems that the product is trying to solve.
- Customer Segments: The target customer segment / users
- Unique Value Proposition: What sets apart the solution to other solutions that solves the problem
- Solution: The possible solutions to each problem
- Channels: The channels of acquisition (inbound, outbound)
- Cost Structure: The costs (fixed and variable) associated with the business
- Key Metrics: The key metrics that will determine the business' success
- Unfair Advantage: The part of the business that cannot easily be bought or copied

2.2 Model for Adaption of Lean Startup Principles in Product Development

In “Running Lean” Maurya models the adaption of Lean Startup principles into concrete steps for product development and gives concrete guidelines for implementation of the framework [23]. The model is focused on technology applications, especially subscription-based business models and therefore provides a well-fitting framework for the development of this present projects development. Maurya adaption model can roughly be summarized into three parts:

1. **Problem / Solution Fit:** Is the problem worth solving?
2. **Product / Market Fit:** Is the solution something people want?

3. **Scale:** How to accelerate growth?

2.2.1 Problem / Solution Fit

Maurya suggests starting by creating a framework of hypothesis using the Lean Canvas. This is the first iteration of the Lean Canvas and is adjusted throughout the process. After capturing the framework of hypotheses for the business model Maurya suggests to interview customers as part of CD.

Maurya [23] suggests to separate interviews into different types of interviews: “Problem Interviews”, “Solution Interviews” and “MVP Interviews” (later step) that are conducted chronologically in sets of at least 10 customers. These stages correspond to the building process of the product and make sure that the development goes hand in hand with the customer development.

In the first set of interviews – the “Problem Interviews” – the problems should be illuminated further and rank the problems in order of significance. These interviews are supposed to not mention solutions at all but are rather used to lay out the problems that the solutions will address. These interviews have the objective to find out the current solutions to the problems, new problems that come up and gauge the level of excitement around solving each problem. These interviews are also meant to already modify the problem hypothesis qualitatively: if some current problems are not mentioned in any of the interviews, they can be thrown out. In this stage, it is also important to segment early adopters, prioritize their biggest problems and understand their used solutions [23].

The second round of interviews – the “Solution Interviews” are focused on the proposed solution. The main objectives of this stage is to learn the minimum features that the solution must have to secure the early adopter and how much they would be willing to pay for it. At this stage, a mock-up or a prototype can be shown as an approximation of the MVP. The feedback will be used to adjust the demo as the interview round progresses. At this stage, beta testers for the MVP can be recruited with incentives such as a rebate but it is important to not promise to provide it for free in order to manage expectations of cost. At the end of this stage, it is important to have a well-adjusted mapping of features to priority problems that potential customers have identified [23].

2.2.2 Product / Launch Fit

After the first two rounds of interviews, it is time to design the MVP. Alongside the development of the MVP Maurya recommends building a product page that allows for deployment and measuring of sales. The last step must have crystalized into a list of problems sorted by priorities that are mapped to key features that the MVP must contain. By now, CD should also be extensive enough to have a list of early adopters that are eager to try the product. These features need to be translated to a framework of requirements and development can begin.

Maury also outlines agile development and continuous deployment – which is a form of rapid development in which the iteration of the software is tested and deployed constantly. During this stage, not much happens on the business aspect as there is no insight to be gained from CD. Maury stresses to release the MVP as quickly as possible to continue the learning process. Before launching the MVP, a sales website as well as testing infrastructure needs to be in place to enable CRO.

The next round of interviews – the “MVP Interviews” – accompanies the iteration of the MVP. Main objective of these interviews are to test how well the MVP delivers on the unique value proposition (UVP) and diagnose obstacles of the sign-up and on-boarding process. The MVP needs to

be adapted after the first five interviews. The MVP needs to be tested and tweaked until 80% of the potential early adopters in this stage have been converted into paying customers [23]. The product is then ready to launch.

2.2.3 Product / Market Fit

Since the next step of product development is much out of scope of this project, it will be summarized shortly. The next step is to optimize the product to increase retention of the product to 40%. Another key metric is to poll existing users to see if they would be “very disappointed” if the product would be discontinued. If these two measures are passed, the next focus should be growth.

To scale, the “key engine of growth” needs to be determined. This can be a referral mechanism for instance by viral mechanisms. If the business is subscription-based, optimizing for retention is the key growth format. If growth can only be accommodated by high conversion costs, funding is the key to scale.

2.3 Market Research

This market research focuses on providing an overview over the E-commerce industry

2.3.1 E-commerce Industry Outlook

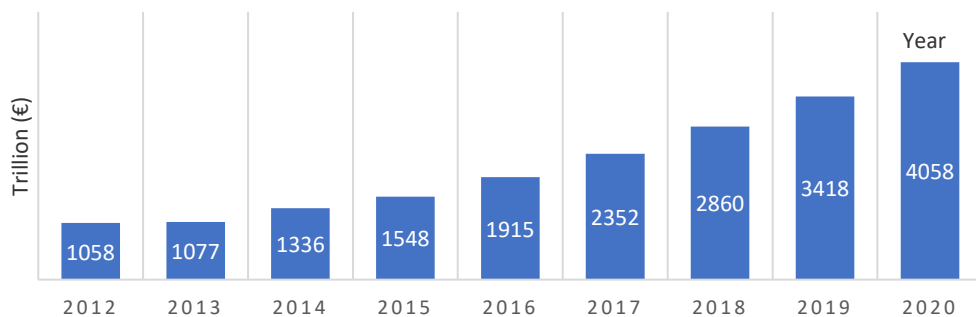


Figure 3 Global E-commerce revenue until 2016 and forecast between 2017 and 2020 [14]

In the past five years, global e-commerce revenue has doubled to 1,9 trillion Euros [1] (Figure 1). In Europe, E-commerce has grown at a rate of 14% annually in the past three years, which makes it one of the fastest growing industry in Europe [2]. The penetration of internet usage, increase in consumer trust in online payment and more diverse supply of goods are all major contributors to this trend [18]. Forecasts estimate e-commerce to continue to grow and double in the next four years [14].

2.3.2 E-Commerce Software Ecosystem

The rapid growth coupled with the thematic closeness to other online industries such as social media has blessed the e-commerce industry with an impressive rate of innovation. The landscape of e-commerce platforms has changed dramatically in the past years. A rich diversity of platforms has arisen with different developing institutions attempting to cater to different needs of different businesses. In the past years, the hosted solution Shopify has established itself as the market leader judging by estimates that take into account the products’ market share, vendor size and social impact

[19]. One of Shopify’s unique selling points was that it is a hosted solution that uses a subscription-based model to deliver its service [20]. This makes the setup of a shop relatively simple compared to self-hosting solutions that often times take much longer to configure and install on a businesses’ own server. Due to Shopify’s rapid growth and accessibility for developers, Shopify’s platform is chosen for this product’s development.

Note: The Shopify ecosystem describes plugins as “Shopify apps”. These terms will be used interchangeably throughout the thesis were they are more appropriate.

2.3.3 Conversion Rate Optimization

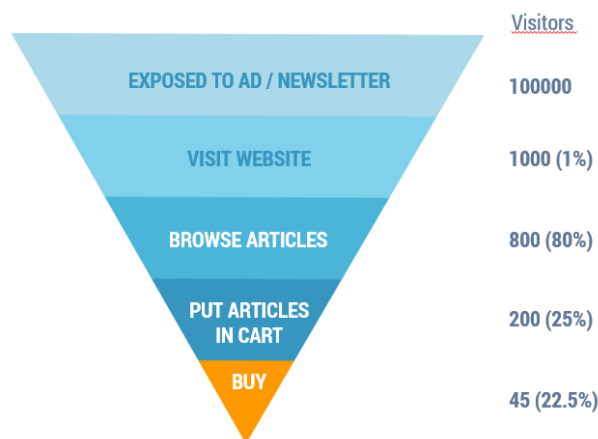


Figure 4 An example of a classic conversion funnel

Conversion rate optimization (CRO) is a system that aims to increase the percentage of visitors to a website that convert into customers (conversion rate) [16]. It is used by shop operators, UX designers and marketers to judge the success of products, product presentations, interface design, marketing campaigns, etc. Unlike traditional retail, in E-Commerce it is possible to record every customer interaction at low cost to attempt to correlate variations in design or strategy with conversion [16]. This provides ample opportunity to systematically increase conversion rate to ultimately increase revenue. Figure 4 shows a classic example of an E-commerce sales funnel. It shows the different steps that illustrate customer journeys from being exposed to an ad to a conversion. Different steps along the sales funnel are defined by different metrics:

- Click Through Rate (CTR): The rate of people that click on the ad / link in the e-mail
- E-Mail Open Rate: The rate of people that open an E-Mail from a campaign
- Add to Cart Rate: The rate of people that add an article to the cart after visiting the article page
- Conversion Rate (CR): The rate of people that buy something from the shop after visiting the shop

There are more metrics that can be measured and given their own name – some more significant than others. Overall, the conversion rate is among the most important metric for an e-commerce website [16] because it has the biggest effect on revenue. However, in a sales funnel, each optimization along the way has a multiplying effect on the next step. If the e-mail open rates are

increased by 50%, that means an increase in revenue of 50%, *everything else being equal*. It is therefore highly within a businesses' interest to put effort into the optimization of their customer journeys through systematic testing of their variables.

Methodology for Conversion Rate Optimization

An existing dominant method in testing for CRO is called A/B testing. A/B testing refers to randomized experiments with two variants, A and B, which usually are the control and the variation in a controlled experiment [24]. It is a form of statistical hypothesis testing that can be used to test many different variables, such as ads, UX flows, product titles.

2.4 Opportunity for an E-Commerce Tool

Ash Maurya has developed a systematic approach to Lean Startup principles during product development. According to Maurya, there are crucial aspects when assessing a Problem / Solution Fit [23]:

- Is it something customers want? (must-have)
- Will they pay for it? (viable)
- Can it be solved? (feasibility)

These questions combined help answer the question “Do I have a problem worth solving?” which is the guiding question in product developing under Lean Startup principles. This chapter attempts to assess this opportunity.

2.4.1 Problem Statement (Motivation)

Implementing A/B testing in existing e-commerce shops is not a trivial task. Companies need to orchestrate the generation of hypotheses, the technical implementation of their testing infrastructure and the evaluation of their tests. The generation of hypotheses for UX changes require usability considerations to form different variations in their design [16].

These usability factors play major roles in designing UX variations:

- Effectiveness: How well the design leads to a certain outcome
- Aesthetics: How pleasing it is to look at
- Accessibility: How easy it is to use

Another effective way to find UX hypotheses is to look at industry recommendations by companies that have tested different UX elements extensively.

Often times, the design of a web shop is done by external firms which means that design variations need to be done in collaboration with that firm. This is resource intensive, as these collaborations are often times non-iterative. The implementation of these tests can also be difficult for shop operators because it requires changes in the source code as well as testing infrastructure that most shop operators are not familiar with. The tests then need to be evaluated and the shop needs to be adjusted according to the test results.

CRO has become crucial to the e-commerce industry and has established itself as a dominant business practice among the biggest firms in the industry [16]. On-site CRO has a direct impact on

revenue and amplifies all marketing efforts since it makes them more efficient through its multiplying effect. This works in the following way: For example, if marketing efforts can generate 10.000 visitors a month at a cost of 3000€, the cost per visitor is 0,30€. If the conversion rate is 10% the cost per conversion is 3€. If the conversion rate can be optimized to 15%, the new cost per conversion is 2€. This means the marketing efforts are now 50% more efficient.

2.4.2 Proposed Solution (Value Proposition)

The proposed solution to this problem is a that can be installed through the Shopify app marketplace as a plugin. This tool suggests testable hypotheses that can be tested automatically through already implemented testing infrastructure. This means that instead of implementing the UX variation and the testing infrastructure separately and manually, the plugin aims to do this for the user. The user (shop operator) can browse proposed UX changes that have already been pre-designed through qualitative analysis of other optimization cases. Many optimization cases have been hypothesized and tested by other shops which are outlined in the "state of the art" [32]. These optimization cases are accessible online but of course don't work with every shop. It's therefore still important to test these hypotheses for users in their own shop. Below are some example hypotheses that the user would have the option to test:

- III. "Changing the 'add to cart'-button from the current color to red will increase the 'add to cart'-rate."
- IV. "Add graphical security certificates to the header of the page will decrease cart abandonment."
- V. "Adding graphical aids to the checkout process will decrease cart abandonment."
- VI. "Offering an instant coupon for newsletter sign-ups will increase newsletter sign-ups."
- VII. "Adding logistical information to the top of the page will increase 'add to cart'-rate."

With all the UX changes predesigned and testing infrastructure implemented, the user simply needs to start the test and the tool would automatically log the test and evaluate it as soon as statistical significance has been reached. The aim is to create the biggest impact on conversion with the least effort spend in configuration and design by the user. This takes away the difficulties that come with setting up tests and hypotheses.

This tool will then be offered in a subscription based model to keep the costs for shop operator analog to their usage. It should be built as a plugin and distributed through existing e-commerce plugin marketplaces. This cuts down configuration time even more. Optimally, all the user needs to do is to install the plugin, browse the hypotheses and start the test. The user will then be informed when the test results are conclusive.

2.4.3 Risk Hypothesis and Market Outlook (Viability)

Technical Feasibility

This product is not a technical innovation, it's a workflow innovation. The technology for administering these tests is widely available [16]. CRO as a concept is also widely used and the most

common UX-based optimization cases are also widely publicized. The technical feasibility of the product can therefore be hypothesized to be quite manageable.

The leading e-commerce platforms come with their own ecosystems for plugins and themes that often times are organized in their own marketplace. These module stores often provide shop operators with an easy solution to install and maintain extra modules which extend the features of their e-commerce solution. These marketplaces are large markets of their own. For example, “SEO Manager” is a Shopify plugin by a company called *venntov* that focuses on the optimization of meta tags that help product pages rank better on search engines. With 6000 active installs at a 20\$ minimum monthly subscription fee, this plugin can be estimated to generate at least \$120.000 in monthly revenue [21]. This shows that users are very willing to spend money on tools to increase their revenue because it affects their bottom line positively. The cost structure seems low enough to test these tools and see if they work for the respective store. Many of these plugins are being sold through the marketplaces that aim to increase revenue through various ways. The exact e-commerce platform for which is tool will be built is to be determined and justified in a later chapter. With over four million shop sites online worldwide, this proposed product seems to have a viable market if it delivers its value proposition.

As mentioned above, the innovation lies within combining known concepts and creating a comfortable implementation at the cost of flexibility and customizability. One major risk could be that users will not want to compromise flexibility and customizability of their tests. Subsequently, the specialized hypothesis for the viability of this solution is:

“Shop operators are willing to spend money to manage their UX-based CRO workflow with limited customizability.”

2.5 Related Products

To analyse existing solutions systematically, the following criteria was set:

- I. Product enables A/B split testing of UX changes and its evaluation
- II. Product facilitates hypotheses generation for UX changes
- III. Product deploys the tests (sets up testing infrastructure, UX changes)

Only products or services that attempt to solve at least one of these criteria will be considered. Using Maurya’s model, the solutions will be evaluated based on the following aspects, similarly to how one would critically evaluate the own product [23]:

- 1) *Problem Fit*: Does the solution address the problems stated above?
- 2) *Popularity*: How often has the product sold? How satisfied seem the users?
- 3) *Price*: What is the pricing model for the product?
- 4) *Channels*: How is the product being distributed?
- 5) *UVP*: What is the unique value proposition?

These are the five most relevant dimensions because they provide insight into what the product offers, how well it solves the problems, how much people are willing to pay for it and what distinguishes the product from others.

Product	Problem Fit	Popularity	Price	Channels	UVP
Experimenter by Monitus LLC [27]	Product addresses I but not II or III	Active installs is not available but product has 7 reviews in store	Product is free	Product is distributed through the Shopify Marketplace	The tool has a point and click UI – which means the variation designs can be created visually inside the shop frontend
A/B Split Test by Zyber [28]	Product addresses I only on product pages (title, image, descriptions and price of a product) but not II or III	Active installs is not available but product has 2 reviews in store	Product tiers range from 9.95\$ to 25\$ according to number of tests per month	Product is distributed through the Shopify Marketplace	Is the only tool in the Shopify Store that allows testing of product pricing
Marketizator by Marketizator [28]	Product addresses I but not II or III	Active installs is not available but product has 0 reviews in store	Product is free up to 5000 views – custom prices above that range.	Product is distributed through the Shopify Marketplace	Designed to support testing of checkout flows
Google Analytics by Google [29]	Product addresses I but extensive setup is required. II and III is not addressed	Ubiquitously used for all kinds of analytics by millions of pages	Product is free	Product is distributed via its own web platform	Designed as a general, feature-rich and flexible analytics tool to track anything online – not specifically designed for splittests
Scenario by Convertize [30]	Product allows I and II by providing a tool to design UX changes visually while	Cannot be found in e-commerce stores and has less than 10 active installs on the Wordpress.org marketplace	Tiers range from a free plan to an enterprise plan starting at 529€ monthly with different levels of visitors per month	Product is distributed via its own web platform with integrations to existing e-commerce platforms; does not seem to be on any e-commerce marketplaces	Uses consumer psychology to help facilitate formation of hypotheses and is powered by machine learning
Optimizely X by Optimizely	Product is the market leader for problem I and addresses II qualitatively through their intelligence blog. Does not attempt to address III	Market leader for A/B testing	Tiers range from 49\$ monthly to enterprise tiers north of 1000\$ a month	Product is distributed via its own web platform with integrations to existing e-commerce platforms	Very feature rich suite for A/B testing and tracking and market leader in CRO – not just e-commerce

Table 1 An overview of the different related products

Table 1 provides an overview of the different related products using the aforementioned criterias. It shows that none of the products address problem III and only some address problem II. This could mean that problem III is not worth solving or that it was not deemed a good fit for these products. Also, most products have a free pricing tier. Most of these products also are platforms that allow a wide variety of UX testing capabilities. All of these products (except for *Scenario*) are very popular which is how they have been found in the first place.

3 Methodology

This chapter presents the methods and techniques and how they are applied in this project. Throughout the project, the Lean Canvas is used to show the iteration of the business framework between stages. An initial Lean Canvas is made before the problem validation stage.

3.1 Problem validation

As already mentioned in chapter 2.2, the project will lean heavily on Maurya's recommendations for the application of the Lean Startup. One major part of this is the problem validation stage. 3.1 outlines the techniques used by Maurya for this stage. The problem validation stage conclusion tries to answer the following questions:

Product risk: What are you solving (Problem)

Customer Risk: Who has the pain? (Customer Segment)

Market risk: Who is the competition (Existing Alternatives)

Afterwards, the conclusions reached will be used to iterate on the Lean Canvas.

3.1.1 Problem Interview Outline and Objectives

Maurya outlines problem interviews to be interviews that focus on validating the business hypothesis around the "problem-customer segment" pair. This means, in the problem interviews the following key questions should be answered:

VIII. Product risk: What problem are we solving?

- How do customers rank these three problems?

IX. Market risk: Who is the competition?

- How do customers solve these problems today?

X. Customer risk: Who has the pain?

- Is this a viable customer segment?

Maurya states that in order to really understand the customer and answer these questions, the customer's world view needs to be explored and illuminated. Maurya also provides a sample structure for the interview (figure 5).



Figure 5 Deconstructed problem interview script by Maurya

The interview can be broken down to the different parts outlined in figure 5. For the present product this will look like this:

Welcome (Set the stage)

Thank you for meeting with me today. I am working on a Shopify plugin that makes conversion rate optimization easy and straight-forward. I got the idea when working with other e-commerce operators when I realized how difficult it is for most shop owners to setup the most basic testing infrastructure. But before getting too far ahead, I wanted to make sure these are problems that enough shop owners are facing to see if it is a product worth building. So, in this interview I would like to describe the main problems my product will address to see which ones resonate with you. I'd like to stress that this is not a finished product yet and I am not trying to sell you anything. My main goal is to learn from you, not to pitch to you.

Collect Demographics (test customer segment)

- XI. How long have you been selling through Shopify?
- XII. How many packages do you send out monthly?
- XIII. What is your monthly revenue (if you are comfortable disclosing)?
- XIV. Who built the shop for you? (Agency, in-house, ...)
- XV. Do you know what conversion optimization or A/B testing is?
- XVI. Do you use any paid apps from the Shopify app marketplace?

Tell a Story (Set Problem Context)

Thanks. Let me tell you about the problems that I am trying to tackle. Testing your user experience with split testing can increase a store's conversion rates and average order value substantially. However, the process of setting up these tests are often times painful because they require external tools and maybe even coding. Coming up with these hypotheses is also difficult because store owners would need some industry knowledge around testing user experiences. For some shop owners I know, they didn't even know where to start testing or how to evaluate it. Some others did not want their agency to bill them more hours for alternate designs when it was just a matter of a button variation. Do any of these problems resonate with you?

Problem Ranking (Test Problem)

Please rank these problems:

- XVII. Do you have problems coming up with UX variations to test (testing hypotheses)?
- XVIII. Do you find it painful to make the variations of your store (technical aspect)?

XIX. Do you find the setup of testing tools (g analytics, etc.) difficult?

XX. Do you think testing your UX can increase your revenue?

Explore Customer's Worldview (Test Problem)

This part of the interview is meant to be off-script. However, these questions below outline a general guidance.

XXI. Have you done split tests for your shop?

- Yes
 - Which tools are you using? And how did you first hear of them?
 - What is your workflow?
 - Who setup the tests for you (technical aspect)?
 - Where do you get ideas for testing hypotheses?
 - Was it worth it?
 - How much effort do you put into testing?
- No
 - Why not?
 - Would you do it if someone did most of the work for you?

Wrapping up (Hook and Ask)

As I mentioned before, this is not a finished product but I am building a Shopify app that will help shop owners implement split tests to raise revenue. Based on what we talked about today, would you be willing to see the product when we have something ready?

Main Interview Objectives

The design of the interview as loosely based on Maurya's model. The main interview objectives were to understand the following about potential customers:

XXII. The acquisition of paid Shopify plugins

XXIII. Whether or not the customer knows A/B testing and its potential impact on the bottom line

XXIV. Who is responsible for the technical development and administration of the shop

XXV. If they had experienced problems with the ideation of UX changes

XXVI. What their testing workflow looks like

XXVII. If the technical implementation of these tests is a pain

At the end of the interview it is important to ask for further contact to build a relationship. This will make it easier to find interview partners and beta testers further down the line. The main motivation of this interview was to gauge the problem points and their priorities for the design of the solution as well as identify problems and considerations that have not been thought of before.

Interviewee Acquisition

According to Maurya, acquiring interviewees should start with first-degree contacts – immediate contacts that meet the target customer demographic. Some of this feedback might be biased. The next step is to ask for introductions and connections. The next step is to cold e-mail and submit forum posts.

For this interview, it is suitable to directly post to the Shopify forums since it is the official community for Shopify shop owners which are the target demographic. A simple post was made to the "Shopify Apps" discussion forum (Figure 8).

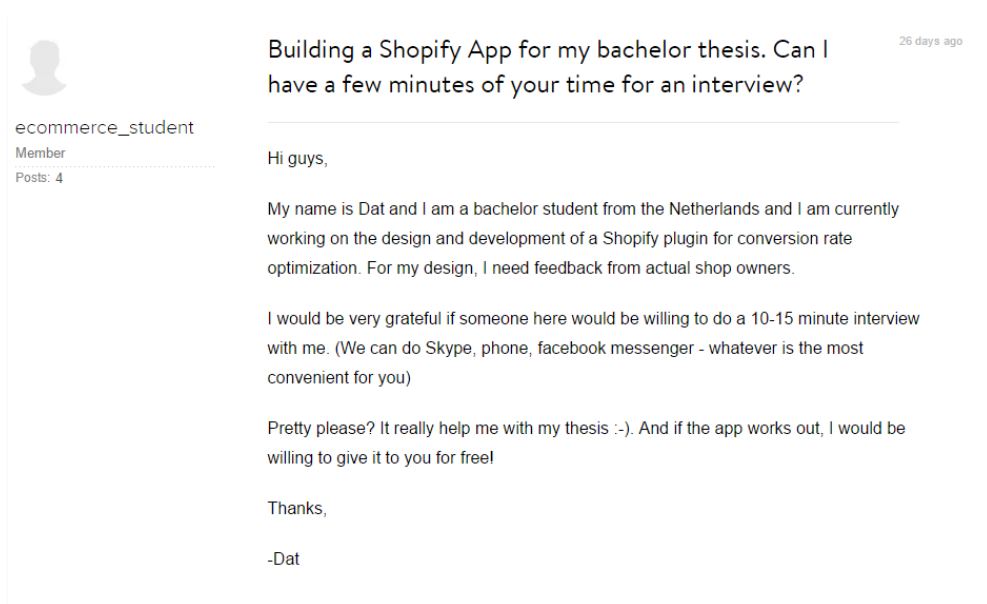


Figure 6 Asking for an interview on the official Shopify forums

Interview Setup

The interview was recorded using *Callnote*, a program designed to record phone calls to *.mp3. The calling platform was *Facebook messenger* since it happened to be the most widely used platform amongst interviewees.

3.1.2 Survey Design

Additionally, a survey was designed based on this interview structure in order to allow answers

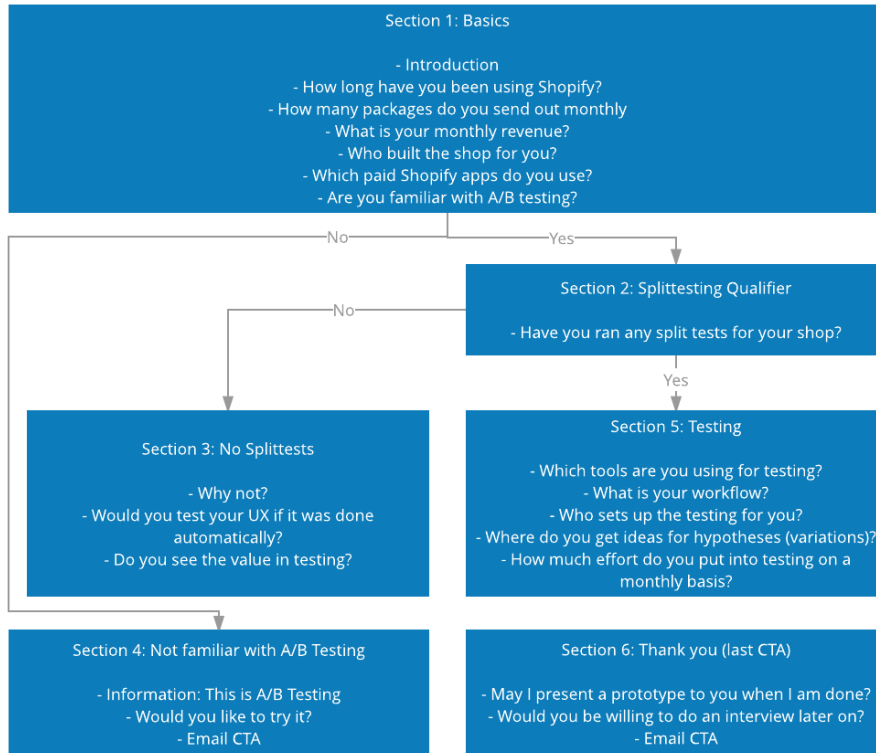


Figure 7 Interactive survey logic based on qualifiers. CTA stands for “call to action”

from potential clients that have a lower threshold for answering since survey participation usually takes less time and therefore potential clients with less time are more likely to answer the survey than to agree to an interview. This interactive survey represents a simplified version of the interview organized in a logic tree based on qualifiers (Figure 7). The survey was done using Google forms and was distributed via an e-mail newsletter to 1600 ecommerce operators by the CEO and founder of FOMO (another Shopify sales app).

3.2 Solution Development

The development of the solution is based on the results from the problem validation stage. 3.2 outlines other methods that aided the development of the solution. Some methods used in the solution development will be used again iteratively during the MVP design.

3.2.1 Stakeholder Analysis

Stakeholders are individuals or companies affected by this project. They can be divided by the strength of their relationship to the project [42]:

Primary stakeholders are people that are directly affected by the results of the project. The most important primary stakeholders are the (beta) users of the tool. This is obviously because it affects their revenue.

Secondary stakeholders are people indirectly affected by this project. For instance this could be other shop owners that are competing with shop owners that have the tool or developers of other tools that serve a purpose similar to that of this tool. The former are mildly affected but in a head-to-head example between two competitors – if one is using the tool and the other one isn't, the former would have a clear advantage given that the tool works. This is only the case assuming that this tool works. The latter are affected by having their tool compete with this tool.

Key stakeholders are people that have an interest in the outcome of this project but are not directly affected by it. For instance, this would be the client or commissioner of this project. Since this project has no client or commissioner, the only key stakeholder is the developer / owner of the product – the author of this thesis.

3.2.2 Requirement Analysis

To prioritize stakeholder requirements, Maurya gives some suggestions. However, the ground this analysis further, the MoSCoW method [43] is used. This method categorizes requirements in four categories:

- Must have: This requirement has to be met
- Should have: This requirement is important but the product can still function without it
- Could have: This requirement is desirable but not necessary
- Won't have: This requirement is not expected to be fulfilled in this iteration but could potentially be realized further down the road

The requirements are conjured from the client interviews, state of the art research and expert opinions. The MoSCoW method will be used complimentary to Maurya's suggestions rather than supplementary, which means that the amount of requirements will still underlie Maurya's suggestions.

3.2.3 Interface Design

The interface design will use a basic 12-column modular grid [44]. For the interface design, wireframes will be made using *Lucidchart*. After an iterative process, the interface will be built with *Adobe Photoshop*.

3.2.4 Branding

At this stage, the product needs an identity so that contacts can be converted to potential leads. A semantic differential is done using Fry's methodology [39]. A semantic differential is a branding model that uses the perception of polar brand images on a linear scale to define a brand. Afterwards, a provisionary name, logo and vision are crafted.

The branding and the app design is made and iterated upon with the feedback of two designers from Agency A¹.

3.3 Solution Validation

After the completion of the validation stage Maurya recommends to proceed to formulate and test the solution. This solution builds upon the understanding of a prioritized problem list and existing alternatives as well as the customer segment’s world view. This stage is meant to validate the solution to the problems, anchor a pricing point and focus the customer segmentation. Maurya states that in this state a demo should be build and then an interview should be conducted, in which the demo is shown and the customer’s interest is peaked. Additionally, other marketing channels are used to get validate the solution further.

3.3.1 Solution Interview Outline and Objectives

The interview is setup and ends similarly to the problem interview, however it is primarily concerned with showing off a demo or a video of a prototype (Figure 10). For this prototype, Maurya recommends to build a realistic looking demo that takes away the customer’s need to fill in the gaps with their own fantasy.

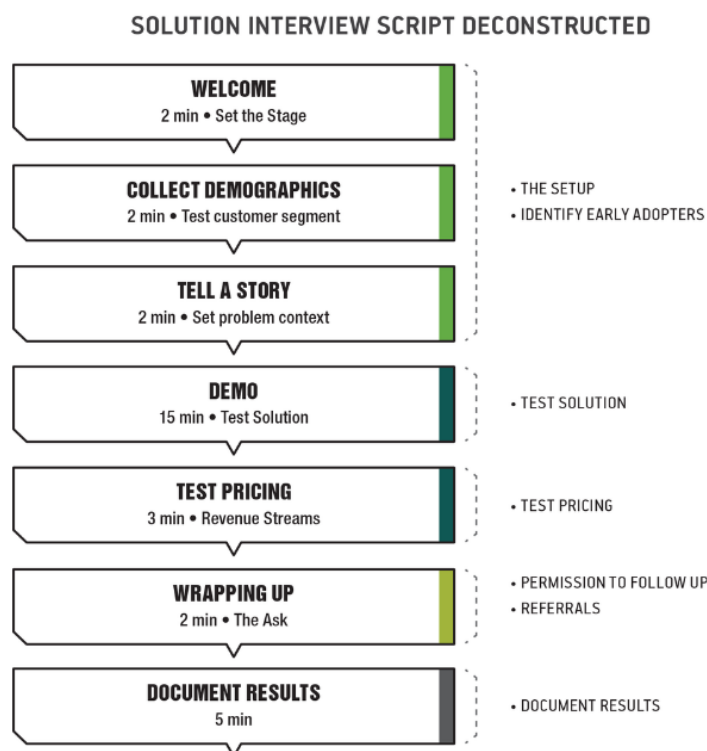


Figure 10: Maurya’s Solution Interview

The customer is then prompted to sign-up to a list of ten early adopters at the price point that is deemed reasonable. The interview script will be inspired by Maury’s suggestions.

Welcome (set the stage)

¹ All people and companies mentioned are listed in 3.5 *People and Organizations*

Thank you very much for taking the time to speak to me today. I am currently working on a Shopify app that implements conversion optimization cases in your store easy and quick. I got the idea after talking to many e-commerce operators that were frustrated with the implementation of conversion optimization cases.

The interview will work like this. I'll start by describing the problems we are tackling and I will ask you if they resonate with you. I also would like to show you an early video demo of our application.

I'd like to stress that we don't have a finished product yet but we are working on a MVP that will come out soon and you can be among the first that we will contact. But let's not get too far ahead of ourselves.

Collect demographics (Test customer segment)

I would like to ask you some questions about your store to get all the basic demographics out of the way. You are obviously always welcome to tell me to skip the question if you don't want the answer to be public.

XXVIII. *How long have you been selling on Shopify?*

XXIX. *How many packets do you send out monthly?*

XXX. *Have you tried A/B testing?*

XXXI. *Who implemented these tests and what does your workflow look like?*

Tell a Story

Great, thanks. So, let me tell you about the problems we are solving. I work for an agency and we consult a few e-commerce owners. Every time they wanted to test variations of their site design, the process was painful. Firstly, they didn't really know what to test for because they are not UX designers, but they understand the value of A/B testing. They had to discuss the changes internally, the changes would have to go to our UI designer, then a round of back-and-forth emailing would ensure until it is approved. The approved design was then developed by one of our developers and implemented by our digital strategists. This was a long and arduous process that we had to go through with each customer. However, many of the insights gained we shared among our customers. That brought us to the idea of automated testing setups for our customers. Does any of this resonate with you?

[If there is no strong problem resonance, continue with problem interview]

Demo (Test solution)

The product I am building is a Shopify app that allows you to pick from CRO cases that are proven and implement them in your store with just a few clicks. For example, testing different trust badges around your store of two different add-to-cart button. The way it works is, you get a suggestion to change the color of your "add-to-cart"-button and you can start the test. The app will then divert half of your visitors to the regular website and the other half to a variation of your storefront that has the different button implemented. The app then measures the conversions and can give you a conclusion to the test as soon as a statistical significance of 97% is reached. You can then choose to implement the UX change or abandon it. Then, you can choose the next test and continuously improve your CRO with these crowd-sourced tests.

Let me show you a video.

XXXII. *What part of the demo did you like the most?*

XXXIII. *Which could you live without?*

XXXIV. *Are there any additional features we are missing?*

Test Pricing (Revenue Streams)

So, let's talk about pricing next. We wanted to make sure that we hit scalable pricing model that is subscription based to make the pricing the most transparent easy to calculate for our customers. Would you pay XX\$ a month for unlimited access to all test cases?

XXXV. *How would you feel about a guarantee that it will raise your revenue by 10% in 3 months?*

XXXVI. *Would you participate in a free trial?*

XXXVII. Would you sign up if this trial had a positive outcome for you?

Wrapping up (the ask)

Thank you for your time today you have been very helpful. We are selecting 5 customers to test our tool with. These customers would receive our product for free the first 3 months after launch. Would you like to give our MVP a spin when we are ready?

Interview Acquisition

One of the biggest difficulties with the problem interview was the acquisition of interviewees. E-commerce owners seem to not be very forthcoming with their numbers and business practices. After all, their processes account for most of their value added in the supply chain. This time, the interview acquisition is focused on directly communicating with potential customers on Twitter. Twitter has grown into a major B2B lead generation channel and many e-commerce businesses rely on Twitter as one of their main social media channels [35]. Contacting people directly via Twitter is personal and it is a direct ask.

Interview Evaluation

The interview evaluation will be based on if the interviewee responds well to the solutions outlined in the Lean Canvas. The second major goal will be how much the user would be willing to pay for the product.

3.3.2 Marketing

Although Maurya outlines a great way to test interest, pricing and segmentation, it might not be the most efficient process to learn because it is still all hypothetical. The sale via a solution interview is hypothetical and not analogous to a real-world case of actually selling the product. On top of that it is inherently not scalable. Thus, in addition to the solution interview this project will employ a mock landing page, selling the prototype. When the sales button is clicked, it informs the customer that the product is not ready and the customer can sign-up to a beta tester round or a newsletter. This method of SaaS idea validation is called *Mock Sales* [36]. Mock Sales is one of the key techniques in Value Proposition Design according to Osterwalder, because it is the fastest way to learn and reach conclusions about a Lean Startup business hypothesis [36].



Figure 8 A mock sales funnel

Using this technique (Figure 8), the converting customers are collected and make up a list of customers that practically already explicitly stated their buying consent. This list can prove invaluable

for CD later on. These relationships can be furthered with content marketing and are a promising source of potential beta testers for the launch of the MVP and future interviews.

Landing Page Design and Infrastructure

Landing pages are sales pages and therefore require similar considerations [37]:

- XXXVIII. Clear and concise headlines
- XXXIX. Trust indicators
- XL. Calls to action
- XLI. Images and videos that show the product
- XLII. A/B testing

WordPress will be used with the plugin "*Simple Site Tester*" that allows quick A/B testing between versions. The theme framework used is *Avada*. The headlines can also be tested. Headlines will be written using Edd's methodology for strategic copywriting [38]. Trust indicators are things such as *security badges* or *social proof*. These trust indicators mitigate buyer's anxiety and ultimately lead to higher conversions.

3.4 MVP Design

3.4.1 UX Hypotheses

The potential UX hypotheses will be selected from two sources:

- **Shopify CRO apps:** There are Shopify plugins that implement a single CRO case. Since these are therefore directly tested by users with reviews accessible through the Shopify store, they are a perfect source for inspiration for UX hypotheses for the tool. This is fitting because the reviews and number of users are stark evidence for the UX cases positively affecting the CR.
- **Articles by CRO experts:** On a recommendation by Agency A², articles by experts will be used as a source for inspiration as well. To select these systematically, the articles are selected by the authority of the writer which is determined by how many people link to the article. For this, ahrefs is used. Ahrefs is a tool that indexes 12 trillion links from 6 billion websites. Ahrefs then rates these links to form a domain rating and a URL rating. The higher the URL rating between 0 and 100, the higher the more authority the backlinks hold which is a good indicator for the authority of a piece of content. If (unweighed) backlinks alone were used, spammers would rank higher. Only recommendations are selected that could be solved with a universal UX change, so for

² All people and companies mentioned are listed in 3.5 *People and Organizations*

example "better product images" can't be solved programmatically, however "implement a red add-to-cart button" could.

3.4.2 Financial Considerations

Financial considerations include the pricing considerations of 3.4.3 as well as a break-even analysis, a cash flow analysis and a cost function. This cost function is linear and takes into account fixed and variable costs according to different growth rates. The growth rates are estimated based on recommendations by Agency A. Since the distribution of this tool would constitute a software startup the cash flow analysis is not as crucial as it would be for a manufacturing company for example since most costs are in manhours rather than monetary.

3.4.3 Preliminary Pricing Considerations

Pre-launch Pricing Considerations

According to Maurya, pricing considerations should be made at this point to anchor the value for prospective customers. The pricing strategy of a SaaS product is one of the key elements of sales and should be tested thoroughly through A/B testing to achieve the highest revenue. However, due to the lack of data for testing and for the sake of speed, a faster pricing strategy model will be used using empirical pricing guidelines (Figure 8).

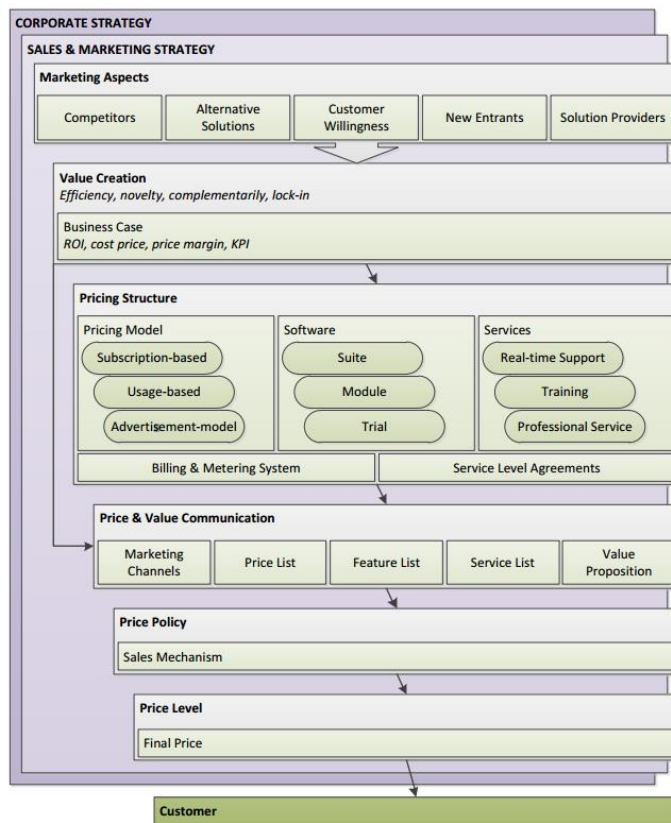


Figure 9 The Pricing Strategy Guideline Framework for SaaS vendors according to Spruit

Pricing Structure

The pricing model will be subscription-based because it suits the market trend amongst Shopify apps and because it most closely correlates to Lean principles in its business development.

For a transparent cost structure, the subscription should scale with unique visitors a month. This has been done by apps like Klaviyo [40]. This makes it easy for the shop operator to calculate his/her costs. Since the app focuses on being very intuitive and simple, one of the key requirements is ease of use which optimally also requires the least amount of support. Nevertheless, support cases might arise in which there should be at one point an online community as well as a ticket system. An estimate of the cost and time necessary to keep up a customer support infrastructure would depend on many factors, such as monthly active users, UI efficiency, etc. and should therefore not be considered at this point.

Value Creation

Value creation is a core factor in determining the worth of this product. For this, the average increased conversions can be used as basis for calculations of added benefit and thus return on investment for the client. If the application can increase conversions by 10%, a store making 50.000€ monthly would gain 5.000€ in revenue. At an average order value of 50€ that takes 1000 purchases. At a conversion rate of 2,5% (which is average [41]) that would take around 40.000 visitors. At 50€ monthly that is 1% of the added revenue and seems reasonable. A free trial of 45 days will be offered. A more elaborate pricing and financial scheme will be considered before the launch of the MVP.

3.4.4 Technical Considerations

Technical considerations about the stack are made on recommendation of Agency A. The class diagram is part of the Unified Modeling Language (UML) [45].

3.5 People and Organizations

Throughout the thesis, companies and CEOs of companies are mentioned. For fluidity, these companies are notated as *Company A*, *Company B*, and so forth. This is the list of companies involved.

-**Company A:** AER is a GoPro accessory company that is based in Enschede. AER is a startup that was founded in 2015 that successfully raised 150.000€ through Kickstarter in 2016.

-**Company B:** Lensball is a camera accessory company that sells spherical lenses that can be used for photography. Lensball was founded as a dropshipping company in 2016 and now averages around 1000 orders a month.

-**Company C:** Geyser is an American company that sells patriotic merchandise. They initially started in 2016 but due to technical issues are going through an IT restructuring

-**Company D:** Burgenland Verpackungen is a German company that sells plastic tableware and party decoration. It is a partner company of Rehoca, a wholesale packaging manufacturer and retailer

-**Agency A:** Transmedial is a creative design agency based in Germany. Transmedial has been involved in over 300 projects and currently maintains 120 clients' media presence.

4 Results

This chapter presents the results of the executing of the methods. Section 4.1 presents the initial Lean Canvas and preliminary requirements. 4.2 presents the problem validation stage. 4.3 contains the solution development stage. 4.4 contains the solution validation. The chapter ends with the MVP design in 4.5. This stages are chronologically.

4.1 Initial Lean Canvas and Requirements

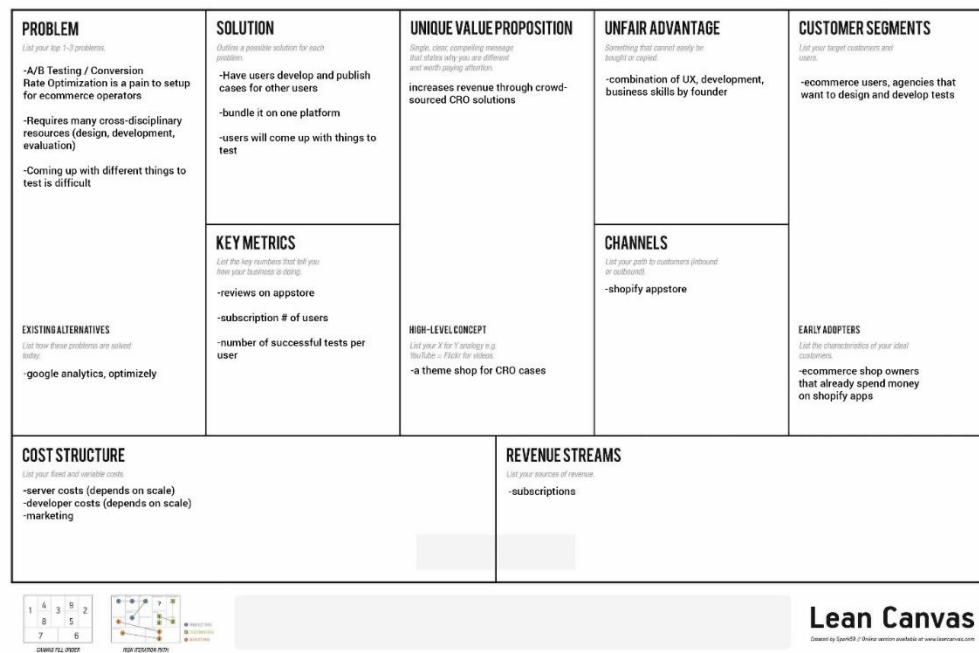


Figure 10 Initial Lean Canvas

The initial lean canvas (Figure 9) encompasses the framework of hypotheses for the initial idea. The point of focus here are the problem statements since all other components are hinging on them. The next step is to validate these problems. As outlined in chapter 2, the Lean Canvas is a fluid framework of a business hypothesis and will evolve throughout the process.

Problems

Problem 1: A/B testing is a pain to setup for shop owners because they lack the technical skills.

Problem 2: A/B testing takes a wide range of different skills. A UX hypothesis is needed, followed by a design, development, deployment and statistical analysis.

Problem 3: Coming up with different case hypotheses is difficult because most eCommerce firms do not have dedicated UX designers.

Solution

A preliminary solution is a platform on which shops can develop tests easily and share them with other shops. This way people can replicate other people's success and shops don't spend all these resources on just themselves. This would also mean the platform is user generated.

Key Metrics

The key metrics are the reviews in the Shopify app store as they are good indicators for user satisfaction. Also, the number of paid subscriptions is relevant for the business since this makes up the main revenue stream. Finally, the number of successful tests indicate the value that this plugin has brought to clients.

Revenue Streams

The monetization model would be a recurring monthly fee (a subscription) for users using the platform.

Unique Value Proposition

As outlined in the initial proposed solution in 2.4, this product offers an array of pre-designed solutions by other users.

Channels

As described in 2.3.2, Shopify is the most promising platform for the platform to be sold on.

Requirements

These preliminary requirements serve as a starting point for future requirement considerations and are the same criteria that were mentioned in 2.5:

- I. Product enables A/B split testing of UX changes and its evaluation
- II. Product facilitates hypotheses generation for UX changes
- III. Product deploys the tests (sets up testing infrastructure, UX changes)

4.2 Problem Validation

The problem validation stage as described in 3.1 contains the conclusions about the problem itself.

4.2.1 Interview Evaluation

In total, three interviews were conducted. They can be accessed via Google drive [33]. The acquisition did not go well, no one on the Shopify forums was actually interested in doing an interview. The interview partners were all immediate contacts. However, many hypotheses were confirmed and the problems resonated with the potential clients. The following are the key qualitative highlights of the interviews.

The interview with the CEO and founder of Company A resulted in a qualitative validation of the first problem hypothesis, that A/B testing is difficult to setup and that they wanted to setup A/B tests but so far, they did not have the right tools that made it convenient for them to do so. They lack developers so coding their own A/B tests was out of question. They also seemed very enthusiastic about someone trying to solve this problem and happily agreed to keep in touch.

The second interview with CEO and founder of Company B also resulted in a qualitative validation of the first problem hypothesis. The company tried to do A/B testing without tools and were not able to reach a good conclusion to their test because of the lack of proper tools. The interviewee stated that he was too overwhelmed by tools that required coding. According to him, finding hypotheses to tests was not their main pain point but rather the implementation of the tests.

The third interview with CEO and co-founder of Company C resulted in a qualitative validation of all the problem hypotheses. They wanted to setup testing but never did because they did not know

what to test and how to test it. This company also has spent more than 5000\$ on software licenses to extend their e-commerce shop and lacked developers.

In conclusion, all three problem hypotheses have been validated with the first one (The setup of A/B testing is a pain) being mentioned in all the interviews. All interviewees seemed excited that someone is working on this problem and all enthusiastically agreed to keep in touch.

4.2.2 Survey Evaluation

Unfortunately, only six people responded to the survey and the answers are quite scattered. There was also no way of identifying the participants and therefore it is impossible to fact check if they are serious. Key highlights:

XLIII. All Shopify operators built the shop themselves; the one Magento participant hired an Agency

XLIV. Most were Familiar with A/B testing

XLV. One participant expressed concerns about loading speed when using a plugin that manipulates the frontend

XLVI. Only one shop gave us an indication about their tools they use for testing: Optimizely and Google Analytics

XLVII. Only two participants split test regularly and spend many resources doing so ("4-6 hours" and "a lot").

Full access to the responses can be found online [34].

4.2.3 Conclusions to problem validation

From the interviews and surveys (9 people in total) and two informal interviews, a better understanding of the problems could be gained.

Product risk: What are you solving (Problem)

Hypothesis

Interviews will reveal that a difficult setup and evaluation of UX changes for CRO is a must-have problem

Insights

Every interviewee expressed frustration with the difficulties surrounding A/B testing even though they all saw the value in it. For two of the interviewees, a plugin would be their most preferred choice of implementation. None of the interviewees wanted to touch code in order to A/B test. Users seemed excited about a potential solution for this and all have had experiences in buying extensions for their e-commerce store. From the survey, most users were familiar with A/B testing. Most did not implement it for the same reasons as the interviewees. Two survey participants actually run tests regularly and spend effort into maintaining their tests. One store spends 4-6 hours designing and implementing tests every month. At an agency rate, this can equate 400-1000\$ a month, at an average hourly rate of 35\$ this is 140 – 210\$. The revenue of these operators ranges from 0 to \$100000 monthly.

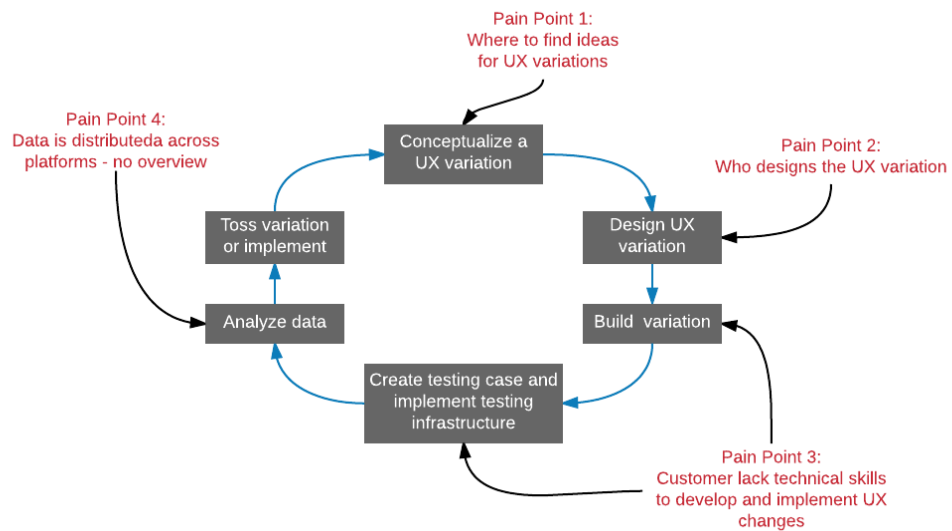


Figure 11 A CRO cyclical workflow with the pain points illustrated

In Figure 10, the workflow of a cyclical CRO workflow is illustrated. Accompanying almost every step of the process, there are pain points. The solution therefore has to be mainly a workflow optimization. This confirms the hypothesis.

Market risk: Who is the competition (Existing Alternatives)

Hypothesis

Potential customers either use Optimizely, Google Analytics, or similar to hardcode tests

Insights

It was expected, that most shop operators use A/B testing already using Optimizely or Google Analytics – however only two out of the eleven contacts actually implement A/B testing. The rest mostly ignored A/B testing due to the difficulties associated with setting it up. This validates the hypothesis partially – one the one hand the solution that was conceptualized until now seems to have even less competition since it competes on a workflow level and not an infrastructure level. Participants as well as interviewees saw value in A/B testing, however and hence would probably use it if it was easier to use.

The product tries to combat this by making the deployment of the test as well as the design and development of the test part of the product rather than providing a platform for testing.

Customer Risk: Who has the pain? (Customer Segment)

Hypothesis

Problem interviews will validate our belief in shop owners as a viable customer segment

Insights

Most participants have either struggled with CRO or spend considerable resources into managing CRO. This confirms our hypothesis. However, it is important to note that a one-click solution will be less flexible and larger stores might just want to go with their custom-tailored solutions.

4.2.4 Post Problem Validation Lean Canvas

After evaluation and validation of the problem a Lean Canvas serves to provide a more concise overview over the problem and solution at hand (Figure 11). Since the problems were now qualitatively and somewhat quantitatively validated, all other aspects of the Lean Canvas now have a much stronger basis to stand on.

PROBLEM <small>List your top 1-3 problems.</small>	SOLUTION <small>List the possible solution for each problem.</small>	UNIQUE VALUE PROPOSITION <small>Single, clear, compelling message that states why you are different and worth paying attention.</small>	UNFAIR ADVANTAGE <small>Something that customer easily take for granted or copied.</small>	CUSTOMER SEGMENTS <small>List your target customers and users.</small>
1. Implementation of UX changes is difficult 2. Ideation of UX changes and subsequent design is not straight-forward 3. Data is distributed across different places making it difficult to reflect on <small>EXISTING ALTERNATIVES</small> <small>List how these problems are solved today.</small> Avoidance of A/B testing altogether G Analytics + Optimizely	1. Design one-click test setups 2. Source UX ideas qualitatively 3. Provide one dashboard within Shopify <small>KEY METRICS</small> <small>List the key numbers that tell you how your business is doing.</small> Sales Trial signups Retention Free version Users Pro version rate Increased CR of customers Review rating in app store	A fast way to increase CRO and therefore revenue <small>HIGH-LEVEL CONCEPT</small> <small>List your X for Y analogy (e.g. NoShizzle – Fisher for NoShizzle)</small> A streamlined UX A/B testing tool for CRO	Combination of technical skills, marketing skills, UX knowledge and e-commerce experience <small>CHANNELS</small> <small>List your path to customers (channel) or channels.</small> Shopify App Marketplace	Shopify store owners <small>EARLY ADOPTERS</small> <small>List the characteristics of your ideal customer.</small> Shops that know about CRO and A/B testing
<small>COST STRUCTURE</small> <small>List your fixed and variable costs.</small> Hosting (Domain, Server) - around 20€ monthly E-Mail (Mailchimp) - free for 1000 e-mails a month Promotion (Blogging, etc.) - 250€ budget		<small>REVENUE STREAMS</small> <small>List your sources of revenue.</small> Subscription of plugin (5-45€ a month) Affiliate through recommendation of other CRO plugins		

Figure 12 Post problem validation Lean Canvas

Problems

The problems were slightly adjusted to accommodate the interviewees' statements. From the analysis, it became apparent that a large problem that came with having distributed infrastructure is not having the data at one spot to look at which is why it was added as a problem.

Solution

After the interview analysis, it became apparent that users do not want to design their own A/B tests – even if it gives them much more freedom. Therefore, the solution pivoted. Initially, the idea was to have users design UX tests for each other that can be published on the platform (like a marketplace). Now, the idea shifted to a plugin that offers UX hypotheses that were designed and developed by the plugin developers, instead of user generated ones. Another big aspect was to combine all the data on one dashboard as well as making it very easy for user to configure these tests before implementation.

Unique Value Proposition

From the post problem validation conclusions, it became clear that users do not want to design their own UX tests. Thus, the UVP was slightly modified to drop the aspect of “crowd-sourced” UX tests because it does not seem like potential users care about where the tests come from as it does not add any value for them. What they do care about is more revenue.

Cost Structure

A few costs were identified but they are negligible compared to the potential revenue since it they don't scale linearly and are relatively low.

Revenue Streams

After talking to some other app developers on Shopify forums the synergetic possibilities became apparent. Many other apps also raise revenue but do not provide testing infrastructure to definitively conclude a raise in revenue / CR. This means that there other apps could benefit from a collaboration with this product and this product would have more UX cases to test.

4.3 Solution Development

The solution development stage presents the development of the solution as outlined in 3.2.

4.3.1 Requirement Analysis

The requirements from 4.1 were iterated upon using input from the interviews. The requirement analysis is done using the MoSCoW model outlined in section 3.2.2. Since for the MVP only the must-have requirements are considered, only the must-have requirements are listed below.

Non-functional requirements

- I. Product facilitates hypotheses generation for UX changes (initial)
- II. The data should be presented in a sightly manner (from 4.2.3)
- III. The UX tests should be implementable by users with minimal configuration (initial)

Functional requirements

- I. Product enables A/B split testing of UX changes and its evaluation (initial)
- II. The product should suggest UX hypothesis (from 4.2.3)
- III. The product needs to be available in the Shopify app store (from 2.2.3)

4.3.2 Branding

As mentioned in the earlier chapter, the app name is meant to sound memorable and have some ties to the meaning of the functionalities.

Semantic Differential

Global	1	2	3	4	5	Local
Speedy	1	2	3	4	5	Methodical
Better Value	1	2	3	4	5	Better Quality
Efficient	1	2	3	4	5	Personable
Businesslike	1	2	3	4	5	Friendly
Youthful	1	2	3	4	5	Mature
Simple	1	2	3	4	5	Sophisticated
Casual	1	2	3	4	5	Formal
Dependable	1	2	3	4	5	Adventurous
Diversified	1	2	3	4	5	Focused
Progressive	1	2	3	4	5	Conservative
Traditional	1	2	3	4	5	Trendy

Relaxed	1	2	3	4	5	Intense
Courageous	1	2	3	4	5	Cautious
High Touch	1	2	3	4	5	High Tech

Name suggestions and logo

<p>Following the trend of using *io, *ify, *o, *y names (a Shopify marketplace trend) the following names could be ideated:</p> <p>XLVIII. Conv ertio XLIX. UXify L. Convers.io LI. Conversify LII. ABio LIII. A/B.io -> Aibio LIV. Aby</p>	<p>Some phonetic cousins or word play could also be used:</p> <p>LV. Testify LVI. Confer ti LVII. Crowd UX LVIII. Crowd y LIX. CROb ar</p>	<p>Buzzword paired with loose meaning to the product:</p> <p>LX. UXCrowd LXI. TestFlow LXII. EverTest LXIII. convertAssista nt LXIV. JustT est LXV. CRO Manager LXVI. CROF low LXVII. C Flow LXVIII. Test Cycle</p>	<p>Buzzwords in random languages:</p> <p>LXIX. Alayntir LXX. Maida -> Maid.ai LXXI. Kisti -> Kist.io LXXII. AI laji -> Alag.io LXXIII. AI ay</p>
--	--	---	---

After filtering out names the name chosen was CRObar, based on the semantic differential that was done in chapter 4. Some type was put together with some iconology (Figure 13).

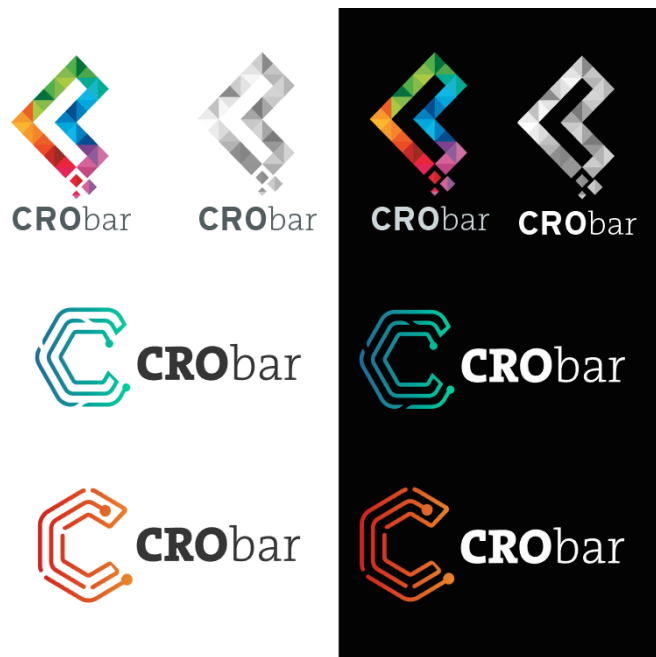


Figure 13 Logo iterations

Finally, based on the semantic differential and some design iterations the final logo was chosen (Figure 14). The color palette is chosen throughout the design of the rest of the application as well as the landing page and other graphics.



Figure 14 Final Logo iteration

Short description

CRObar provides easily implementable conversion rate optimization (CRO) cases that can be implemented and tested in your store with a few clicks!

4.3.3 Wireframes

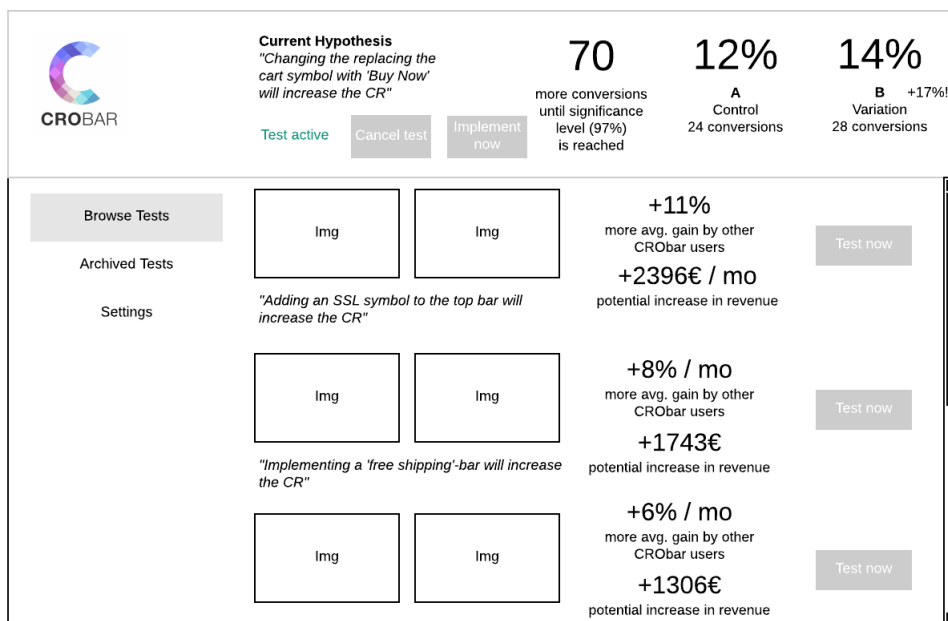


Figure 15 First page of wireframes made in LucidChart. All wireframes can be found in Appendix

Wireframes were made using *LucidChart* (Figure 15). The wireframes allowed for a more efficient design process because it allowed for quick drastic changes. The wireframes were not interaction tested since they are not the final app design but only for the screenshot mockups.

4.4 Solution Validation

This section contains the validation of the solution as outlined in section 3.3.

4.4.1 Interview Evaluation

In total, 4 interviews were conducted with the same people that participated in the first round as well as one more interviewee. They can be accessed via Google drive [33]. The acquisition was also very difficult which is why only one more person agreed to an interview. However, the solution could be validated, good feedback was given and a pricing strategy was conceptualized. The methodology, script and goals of this interview was outlined in sector 3.3.1. The interview recordings are accessible online [33]. The interviews are evaluated based on whether or not they respond positively to the three solution hypotheses outlined in the Lean Canvas in sector 4.2.4:

- I. Design one-click test setups
- II. Source UX ideas qualitatively
- III. Provide one dashboard within Shopify

As already mentioned in 3.3.1, if the user responds well to one feature, it counts as being validated.

The first interview with the CEO and founder of Company A resulted in a qualitative validation of the first two solution hypotheses. They would be interested in simple setups of simple UX tests. They lack developers so coding their own A/B tests was out of question. He also seemed very enthusiastic about someone trying to solve this problem and happily agreed to keep in touch. He stated he would pay 20€ per month for this product if it can guarantee a certain uptick in revenue.

The second interview with the CEO and founder of Company B resulted in a qualitative validation of all three solution hypotheses. He liked the idea of having little configuration and the app working out of the box. He agreed to the interview under the agreement to that we could test the product for 6 months for free. While Maurya advised against giving the product away for free due to price anchoring issues, the interview was invaluable. During the demo, the potential user immediately understood what the product is supposed to do and how we would navigate through the app. However, this could be because the product was explained the first 10 minutes of the interview. The user's revenue was above €11000 but and he was willing to pay 25€ a month for it.

The third interview with the CEO and founder of Company C resulted in a qualitative validation of the first and the last solution hypothesis. The user has a background in UX and stated that he could have done the UX concept himself but he appreciates that it would be developed for him. The interviewee understood the demo right away and wanted to use the product. However, he would not be willing to pay a monthly subscription for this. His shop is currently making a little less than €4000 in revenue monthly.

The fourth interview with the CEO and founder of Company D resulted in a qualitative validation of the first solution hypothesis. However, the user had difficulties understanding the UI of the product (the mockup) and it was difficult to convey the difference between an archived and an implemented test case. This could be described differently. The user would be willing to pay €75 but did not want to disclose the revenue.

The last interview with the CEO and founder of Company E did not validate the solution at all. The interviewee was not one of the interviewees from last round and did not fully understand the product. After some explanations, the user was willing to give it a try but did not indicate that he would pay for it since he didn't fully understand what it did.

In conclusion, the general idea behind the solution could be validated and three beta testers were recruited for the MVP. This is validation enough to build the MVP. Users felt much more at ease discussing potential prices when mentioning that it would increase conversions by at least 10%. This is not a hefty promise since other tools increased the conversion rate by upwards of 20% while deploying only one UX tweak.

4.4.2 Marketing Campaign Evaluation

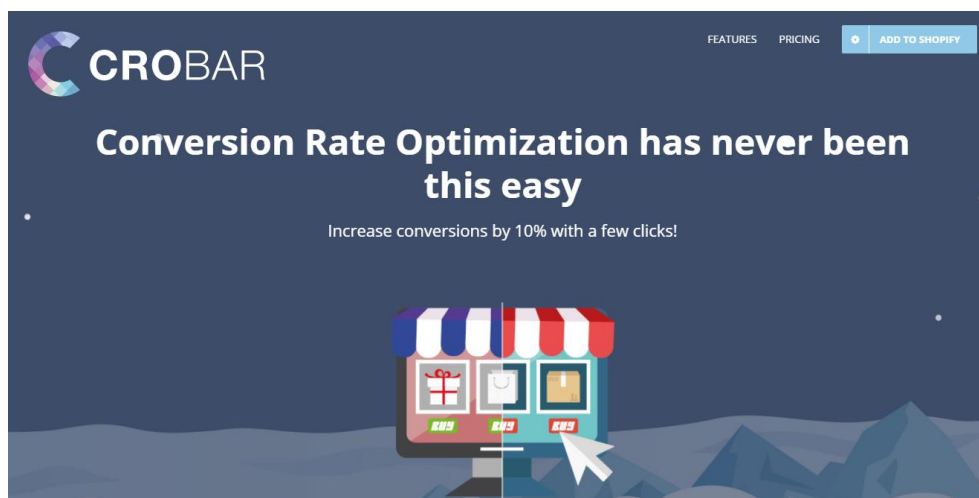


Figure 16 First page of landing page. The whole screenshot is available in the appendix

Landing Page

The landing page (Figure 16) is accessible at <http://crobarapp.com>. The landing page used two different headlines that were tested using A/B testing. The first (control) version read "Conversion Rate Optimization has never been this easy" and the second one read "The Age of One-Click Conversion Optimization Test Deployments is Now". Both versions had the subtitle "Increase conversions by 10% with a few clicks!". Unfortunately, these tests could not meet statistical significance since not enough visitors visited the website.

Google Analytics shows that only 31 unique visitors came to the website (Figure 17). From those 31 visitors, 46 sessions were had. 10 visited the /signup page which indicates that they would have possibly be interested in giving the application a spin.

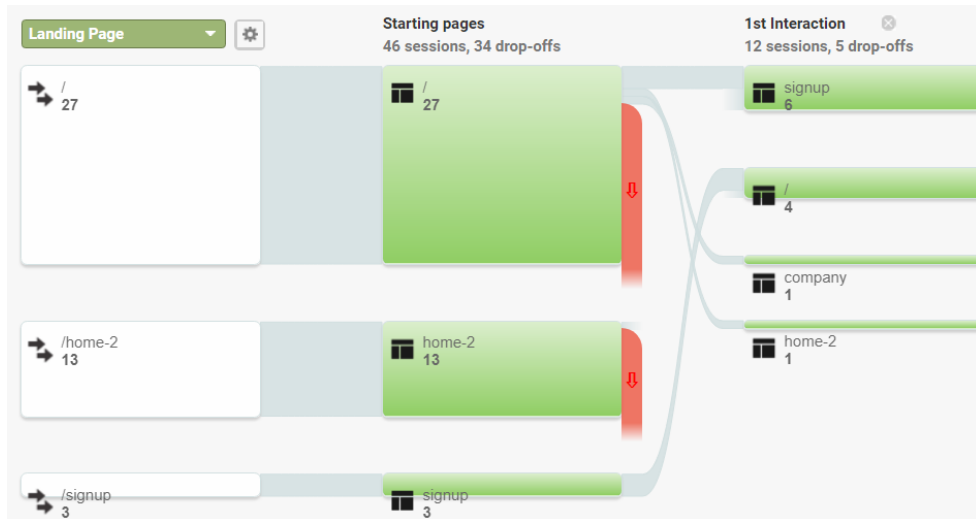


Figure 17 Behavior flow of visitors

The variation page had the url /home-2 and was served 13 sessions while the main page had 27. A click on the “Add to Shopify” button counts as a conversion in this case, so A had 6 conversions and B had 2. That is a conversion rate of 22% and 15,4% but no statistical conclusion can be made since the p-value is only 0.7032.

In conclusion, the landing page could have been much more impactful if it had gotten more traffic but this was to be foreseen since almost no marketing initiatives were made and it was not the primary focus of the solution fit stage. The reason why it is online is to bundle together the language and give social media traction a place to go.

The landing page was made instead of the surveys from the problem fit stage which is explained in chapter 2. In conclusion, though there is not a high statistical significance, the app and the website rank fairly well with a conversion rate of 22% and 15%.

Facebook ads

To test the landing page and how people would react to this software, different Facebook ads were created using similar copywriting but different images. For all Facebook advertising the following target group was used:

Location: USA, Job: self-employed, Likes: Shopify

The audience size was around 170.000 user but the budget was limited to 40\$ so it did not reach that many people.

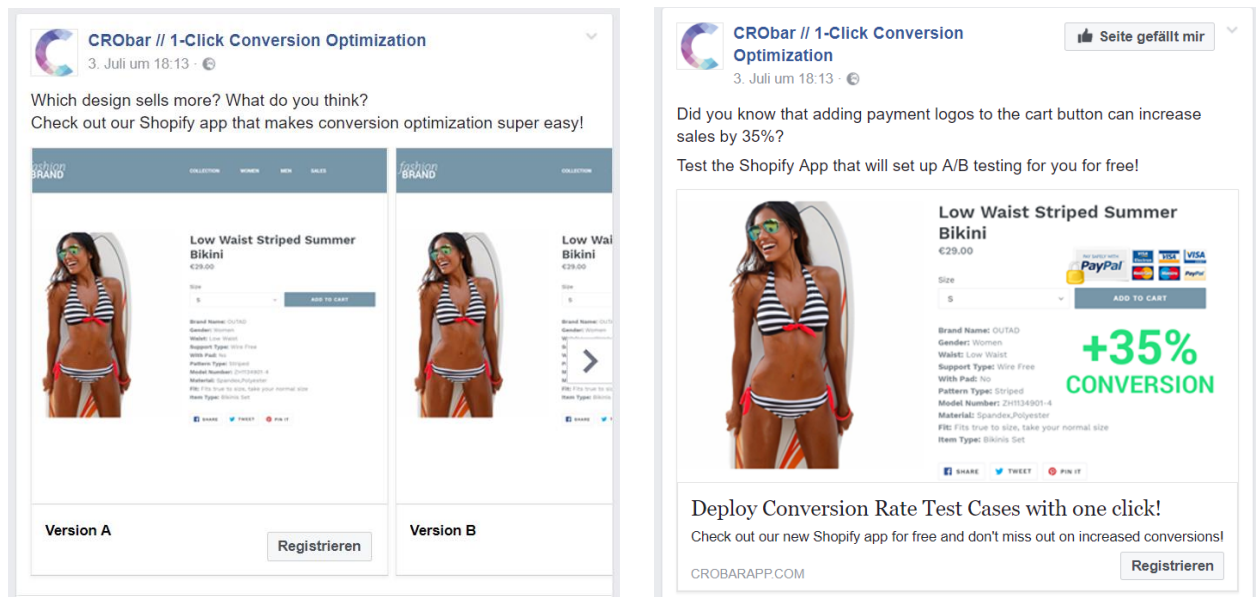


Figure 18 Facebook Ad 1 (left) and Ad 2 (right)

Ad 1 (left) featured an image carousel and Ad 2(right) had a larger image. The copy was also different. The ads had 1272 impressions. Ad 1 had 790 of those impressions and received 8 link clicks. Ad 2 had 482 impressions and 4 link clicks. That's a conversion rate of 1% and 0,84%. With this low amount of impressions, a statistical conclusion could not be reached.

In conclusion, the Facebook ad did drive the few visitors to the landing page like initially planned. However, it was very expensive to pay for and therefore discontinued. The ads averaged around 1,33\$ per click which is not economical to pay for simple visitors to the landing page.

4.4.3 Conclusions to Solution Validation

The interviews during the solution validation stage

Product risk: Do prospective users like your solution?

Hypothesis: Users will require all three features outlined in 4.2.4

Insights: Most users liked two out of the three. The most important feature was the deployment of the UX cases. Overall, this hypothesis was supported by the interviews. The interviewees The last interview however was troublesome because it showed that some users are not knowledgeable enough to know how much CRO could increase their revenue. This will affect the communication around the product. It is very likely that the product will need some walkthrough or some sort of guide to new users.

Market risk: How much are users willing to pay?

Hypothesis: Users will be willing to pay 15-50€ per month if they have a revenue higher than 6000€.

Insights: Most interviewees were willing to pay 20€ if they could see results. The most striking insight here would be that they are even more likely to pay if the product could guarantee an increase in conversions verifiably. This can be done by providing a free trial. The final lean canvas (post solution validation) can be found in section 4.5.7.

4.5 MVP Design

4.5.1 MoSCoW Analysis

The requirements from 4.3.5 were iterated upon using input from the interviews. The requirement analysis is done using the MoSCoW model outlined in section 3.2.2. Since for the MVP only the must-have requirements are considered, only the must-have requirements are listed below.

Non-functional requirements

- I. Product provides UX hypotheses to choose from (from 4.2.3)
- II. The data should be presented in a sightly manner (from 4.2.3)
- III. The UX tests should be implementable by users with minimal configuration (initial)
- IV. Product must increase conversion rate by at least 10% (from 4.4.3)

Functional requirements

- I. Product enables A/B split testing of UX changes and its evaluation (initial)
- II. The product needs to be available in the Shopify app store (from 2.2.3)

4.5.2 UX Hypotheses

The concept is based on the collected data by users to present reliable hypotheses to other users. Since there is no user base to begin with, a qualitative analysis is needed to provide the initial tests for users. Many industry experts have written about potential UX hypotheses to test for CRO. Another great source for CR hypotheses is the Shopify app store itself. There are plenty of applications that claim to raise the conversion rate. The qualitative analysis of these tests will include a combination of expert recommendations through published articles and Shopify apps that have many positive reviews.

Shopify Apps

The criteria for selecting are the following:

- I. The app claims to raise conversions through UX
- II. The app has at least 20 reviews with a 4 star rating or higher

App: Happy Customers - Free Promotion Bar Description: The bar shows the number of orders the store has processed. Reviews: 5 stars at 587 reviews
App: Conversion Plus Description: Adds a cart reservation timer to create urgency Reviews: 5 stars at 147 reviews
App: Mobile Web Boost Description: Adds a sticky cart button to the mobile version of the shop Reviews: 5 stars at 96 reviews
App: SalesPop / Fomo / SocialProof

Description: Adds social proof by showing a small popup whenever someone buys a product Reviews: 5 stars at 149 reviews
App: Checkout Hero Description: Adds a share option to the checkout process for instant coupons Reviews: 5 stars at 84 reviews
App: TRUST Description: Adds trust icons to the store Reviews: 5 stars at 491 reviews

Another advantage that the analysis of Shopify apps brings is that not only are these apps proven to work for conversion but they also are technically feasible.

Expert Analysis

Author	Website	URL rating (ahrefs)	Recommendations
Peep Laja	https://conversionxl.com/increasing-ecommerce-conversion-rates/	36	Advertise free shipping on the page / Show contact info at the top of the page / Implement live chat feature / Add progress bar to checkout process / Show trust badges / Add payment options
Neil Patel	https://www.crazyegg.com/blog/improve-conversion-rate-ecommerce/	22	Advertise free shipping on the page / Use a highlight color for the add-to-cart button / Show contact info at the top of the page
Matt Janaway	https://www.searchenginepeople.com/blog/25-conversion-rate-boosters.html	24	Time-sensitive shipping / Display free shipping / Add free phone hotline / advertise free shipping
Corey Ferreira	https://www.shopify.com/blog/53641349-6-bulletproof-ways-to-improve-conversions-on-your-product-page	23	Integrate live chat / Display badges + seals / add a "ships to [country]" indicator / add shipping info to product page

First test cases

From the expert opinions and other Shopify apps the most feasible and effective hypotheses seem to be (ordered by ascending difficulty of implementation):

- 1 "Show contact info at the top of the page"
- 2 "Show trust badged and shipping info on product page"
- 3 "Show the number of order a store has processed"
- 4 "Add a sticky add-to-cart button to the mobile version"
- 5 "Integrate live chat"
- 6 "Integrate pop ups when sales are made"

4.5.3 Statistical Model

Mathematically speaking, A/B testing is nothing more than applied confirmatory data analysis. A statistical hypothesis test is a method of statistical interference. In the case of A/B testing the goal of the test is to determine whether or not to reject the null hypothesis which in this case is that the conversion rate of the control treatment is no less than the conversion rate of our experimental treatment

$$H_0: CR_c - CR_v < 0$$

Where CR_c and CR_v denote the conversion rates of the control version and the variation, respectively. For the confidence interval, 90%, 95% or 99% should be chosen appropriately. However, this choice should not be made without the user. The higher the required confidence interval is, the more data (and subsequently time and therefore opportunity costs) is needed. If 99% is chosen every time, many shops that have a low conversion volume (either due to shop size or high average order value) could run into the problem of having tests drawn out too long. If 90% is chosen every time, the risk of choosing the wrong variation is higher.

An example

	Visitors	Conversions	Conversion Rate
Variation A	10000	1000	10%
Variation B	10000	1084	10.84%
Total	20000	2084	-

The relative uplift in Conversion rate would be $CR_c - CR_v = 10\% - 10.84\% = 0.84\%$ or an 8.4% increase. At a 90% confidence interval, this result is statistically significant and at 95% it is not. For some owners, it would be satisfactory at this point and they would happily implement the test and enjoy a 8.4% increase in conversions and for some it would be too risky. To make a more informed decision, a few more hundred visitors would do the trick and reach statistical significance. For shop owners that have a high volume of traffic for example 20000 a day, it wouldn't be very costly to run the test for another day or a few hours. For other shop owners that have a relatively low number of visitors every day, for example 500, waiting this long would mean losing out on days in which they can't test another test. Some shop owners are also personally more risk averse. Therefore, the responsibility should lie within the user and the product's responsibility should be to inform the user to make the right choice. The application should have an option that would estimate how many more visitors it would take to reach a certain level of statistical significance. This can be determined linearly:

Assuming the conversion rates hold up (which is the best guess), all visitors and conversions could be projected by adding 2%:

	Visitors	Conversions	Conversion Rate
Variation A	10100	1010	10%
Variation B	10100	1094	10.84%
Total	20200	2104	-

This result is statistically significant at a 95% confidence interval and what it would take are 400 visitors more. At a 99% confidence interval it is still not statistically significant. After adding 78%, or 15600 visitors and 1641 conversions later a confidence interval of 99% is reached.

	Visitors	Conversions	Conversion Rate
Variation A	17800	1780	10%
Variation B	17800	1930	10.84%
Total	35600	3745	-

For many shop owners, this is too long to wait - almost double current testing duration. So as already mentioned above, the more responsible way would be to let the user decide after providing him/her with the best information possible:

	Visitors	Conversions	Conversion Rate
Variation A	17800	1780	10%
Variation B	17800	1930	10.84%
Total	35600	3745	-

Recommendation: Testing has determined a 8.4% uplift of the conversion rate at 94.82% confidence. We estimate that 95% confidence will be reached after 400 more visitors (recommended) or 15600 more visitors to be absolutely sure (99% confidence).

4.5.4 Class Diagram of MVP

This is the class diagram that was mentioned in section 3.4.4.

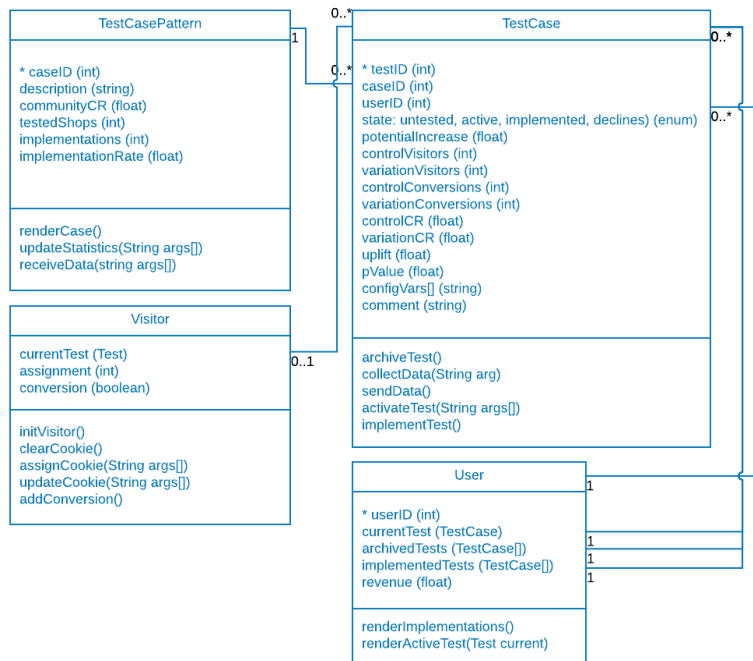


Figure X: Class Diagram of MVP

The class diagram is used to describe the relationship between the classes. The following are short descriptions of the classes and functions that don't have a self-explanatory name. The multiplicities are expressed using Chen's notation. This diagram is a preliminary model of the classes since it does not take into account infrastructure considerations that are made later on.

Hypothesis

This class models the different testing hypotheses that can be pushed to all users. The `renderCase()` function renders the test on the frontend. The `receiveData()` function is called when a `TestCase` uses `sendData()` when implementing, activating or archiving the `testCase`.

TestCase

This class is instantiated for each user and holds all the relevant information for the users test of a `Hypothesis`. The `collectData()` function is called by `Visitor` instances to collect the data and recalculate the saved data.

User

This class is instantiated for each user and holds the other `TestCases` as well as the revenue from the shop so that revenue prognoses can be made.

Visitor

This class is instantiated for each visitor to the shop and is used to control the frontend tests. This class is mainly used to handle the assignment of cookies required for each test case and update them accordingly when the visitor comes to the store.

Since this class diagram is a short overview that does not take infrastructure into considerations, it is not used for the final implementation yet but rather just provides an overview of the relationship between classes. Hence, public and private classes are not declared denoted yet. Since the application will have distributed infrastructure using a Ruby on Rails API, some of these classes and functions need to be split into the frontend and backend. This definitely changes the frontend functions since as of right now it uses the `renderCase()` function from the model that is retrieved from the backend. It is worth considering to reorganize the `renderCase()` function into URLs that point to a javascript and css file that implements the test, since Ruby on Rails won't be running on Shopify servers. These considerations will be elaborated under section 4.5.5.

4.5.5 Stack and Infrastructure

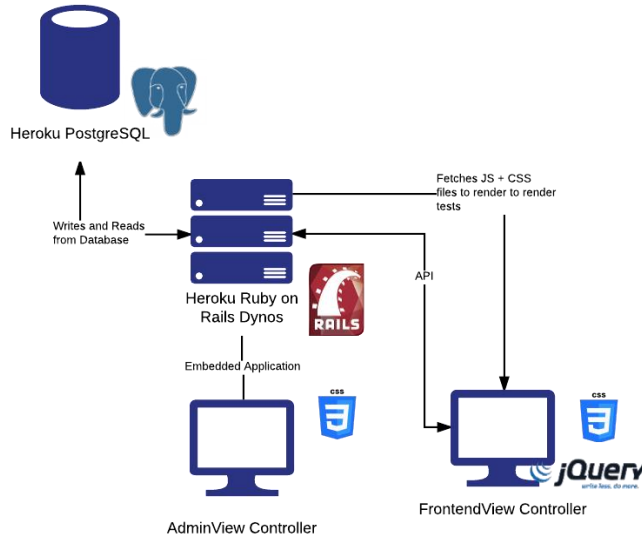


Figure 19 Stack diagram for the tool

Ruby on Rails

Shopify supports embedded apps using Ruby on Rails out of the box and therefore Ruby on Rails was the quickest technology to deploy. The only downside of Ruby on Rails is that it is known to run into performance issues at large scales (1000000+ users) due to its blocking IO. However, for now Ruby on Rails is more than sufficient since high user loads are not expected yet. At later stages, There are non-blocking Ruby on Rails libraries that can be used to optimize performance. Additionally, Heroku allows for automatic scaling using more workers at any point. Thus, scaling and performance issues are not important as of right now. Finally, Ruby on Rails works with a Model View Controller (MVC) that suits this application well.

Heroku

Heroku is a cloud platform as a service (PaaS) that allows developers to build, deploy and scale applications easily. This eliminates the need for an own server. Heroku allows the addition of workers (dynos) at any point, which makes scaling easy and efficient. A server (virtual or dedicated) would have to be reconfigured to accommodate scaling. Heroku's distributed cloud service also allows for better performance from anywhere in the world since the serve response time is much lower than it is for servers with a specific location. Additionally, Heroku also has extra features such as continuous deployment through their own Git service. Heroku will also be used to store Javascript and CSS files that are used to render tests.

PostgreSQL

PostgreSQL was chosen for performance and simplicity. It's hosting is also provided by Heroku and works out of the box when creating a Heroku project. Using PostgreSQL on Heroku also allows for automatic scaling which means that the database will automatically scale in size as it grows.

Functionality

The AdminView is rendered using an embedded version of the Ruby on Rails application. In the frontend, the FrontView controller is written in javascript and loads CSS and Javascript files to render the test cases. The frontend also communicates with the backend directly via a restful API.

4.5.6 Financial Considerations

To make proper pricing decisions, some forecasts are in order such as a more elaborate cost analysis as well as a cash flow analysis and a break-even point analysis. The methodology for this is laid out in section 3.4.2 and 3.4.3.

Pricing Strategy

To keep the pricing strategy simple and straight forward the different pricing tiers will solely depend on the number of visitors.

5 most common tests	All tests	All tests
Up to 5k monthly visitors	Up to 20k monthly visitors	Unlimited monthly visitors
Free	25€	75€

Costs

Customer Support

Customer support is the first area of work to be outsourced. As customer support (including sales questions) scales with number of clients and store exposure, it is estimated to be one hour per 10 customers monthly. One hour of a quality customer support costs 18€ per hour so it is a function of $C_{cs} = 1,8n_c$, where n_c denotes number of clients.

Hosting

Heroku charges 10€ per month for the basic database and 7€ for one dyno (worker). The basic database service scales up to approx. 100 users before costing 20€ and each dyno can serve up to 50 users. Therefore the cost of hosting can be approximated by

$$c_h(n_c) = \frac{7}{50}n_c + 10 \quad \text{for } n_c < 100 \text{ and}$$
$$c_h(n_c) = \frac{7}{50}n_c + 20 \quad \text{for } n_c \geq 100$$

Development & Code Maintenance

Since development is not outsourced until much later, it will be estimated that after 500 users five hours of development will be needed each month per 200 users. One hour of Ruby on Rails development using freelancers costs approximately 35€.

$$c_d(n_c) = 0 \quad \text{for } n_c < 500 \text{ and}$$
$$c_d(n_c) = \frac{175}{500}n_c \quad \text{for } n_c > 500$$

Promotion

This counts the costs of making content for photo licenses, etc. This will be approximated by 100€ a month.

Counting all costs together we get the following monthly costs

$$c_{total}(n_c) = 1,94n_c + 100 \quad \text{for } n_c < 100 \text{ and}$$

$$c_{total}(n_c) = 1,94n_c + 120 \quad \text{for } 100 \leq n_c < 500 \text{ and}$$

$$c_{total}(n_c) = 2,29n_c + 120 \quad 500 \leq n_c$$

Taxes

Taxes are not considered at this point thus revenue is income before taxes.

Revenue

The pricing model above we have a free tier and a 25€ and 50€ price point. According to some SaaS experts [ref] SaaS pricing strategies foresee 20% of users will be paid users. Out of those 20%, users will pick the highest pricing package. For a rough estimate out of 100 users, 20 will be paid users: 16 at 25€ and 4 at 75€. This means 700€ per 100 users. So $7n_c$.

The revenue approximation will foresee revenue for 3 rates of user acquisition: 12, 24 and 36 users per month.

Break-even analysis / Cash-Flow

From the considerations above, we get the following table. Since costs are relatively low and scale with userbase, there is no "red-zone" in the beginning of the business.

M onth	N (12-growth)	N (24-growth)	N (32-growth)	R (12-growth)	R (24-growth)	R (32-growth)	C (12-growth)	C (24-growth)	C (32-growth)	I (12-growth)	I (24-growth)	I (32-growth)								
1	2	4	2	3	8	68	1	14	16	-	21	61								
2	4	8	4	6	1	36	3	19	22	21	14	22								
3	6	2	7	9	2	52	5	23	28	82	26	38								
4	8	4	6	9	28	3	72	6	96	8	38	52								
5	0	6	20	1	60	1	20	4	40	8	120	1	16,4	2,8	35	43	20	48	68	
6	2	7	44	1	92	1	5	1	1	2	39	49	26	60	85					
7	4	8	68	1	24	2	88	5	176	1	568	1	62,96	5,92	44	55	32	73	10	
8	6	9	92	1	56	2	72	6	344	1	792	1	86,24	2,48	49	61	38	85	11	
9	08	1	16	2	88	2	56	7	512	1	016	2	29,52	9,04	53	67	42	97	13	
0	1	20	1	40	2	20	3	40	8	680	1	240	2	52,8	5,6	58	74	48	10	14
1	32	1	64	2	52	3	24	9	848	1	464	2	76,08	2,16	63	80	54	12	16	
2	44	1	88	3	84	008	016	688	99,36	8,72	4,96	8,64	37,28	23,04	18					
3	56	1	12	3	4	092	184	912	22,64	5,28	7,04	9,36	58,72	84,96	19					
4	68	1	36	3	4	176	352	136	45,92	1,84	9,12	0,08	80,16	46,88	21					
5	80	1	60	3	4	260	520	360	69,2	8,4	51,2	0,8	01,6	08,8	23					
6	92	1	84	3	5	344	688	584	92,48	4,96	72,48	1,52	23,04	11,52	24					
7	04	2	08	4	5	428	856	808	15,76	1,52	45,76	2,24	44,48	62,24	25					
8	16	2	32	4	5	512	024	032	39,04	8,08	19,04	2,96	65,92	12,96	27					
9	28	2	56	4	6	596	192	256	62,32	04,64	92,32	33,68	87,36	63,68	28					
0	40	2	80	4	6	680	360	480	85,6	51,2	65,6	94,4	08,8	14,4	30					
1	52	2	04	5	6	764	528	704	08,88	54,16	38,88	55,12	73,84	65,12	31					
2	64	2	28	5	7	848	696	928	32,16	09,12	12,16	15,84	86,88	15,84	33					
3	76	2	52	5	7	932	864	152	55,44	64,08	85,44	76,56	99,92	66,56	34					
4	88	2	76	5	7	016	032	376	78,72	19,04	58,72	37,28	12,96	17,28	36					

5	2	3	6	8	2	4	5	7	13	18	13	28	37
5	00	00	00	100	200	600	02	74	32	98	26	68	
6	2	3	6	8	2	4	5	7	14	19	14	29	39
6	12	24	32	184	368	824	25,28	28,96	05,28	58,72	39,04	18,72	
7	2	3	6	8	2	4	6	7	14	19	15	30	40
7	24	48	64	268	536	048	48,56	83,92	78,56	19,44	52,08	69,44	
8	2	3	6	8	2	4	6	7	15	20	15	31	42
8	36	72	96	352	704	272	71,84	38,88	51,84	80,16	65,12	20,16	
9	2	3	6	9	2	4	6	7	15	21	16	32	43
9	48	96	28	436	872	496	95,12	93,84	25,12	40,88	78,16	70,88	
0	3	3	7	9	2	5	6	8	16	21	17	33	45
0	60	20	60	520	040	720	18,4	48,8	98,4	01,6	91,2	21,6	
1	3	3	7	9	2	5	6	8	17	22	17	35	46
1	72	44	92	604	208	944	41,68	03,76	71,68	62,32	04,24	72,32	
2	3	3	7	1	2	5	7	8	17	23	18	36	48
2	84	68	024	688	376	168	64,96	58,72	44,96	23,04	17,28	23,04	
3	3	3	7	1	2	5	7	8	18	24	18	37	49
3	96	92	056	772	544	392	88,24	13,68	18,24	83,76	30,32	73,76	
4	3	4	8	1	2	5	7	9	18	24	19	38	51
4	08	16	088	856	712	616	11,52	68,64	91,52	44,48	43,36	24,48	
5	3	4	8	1	2	5	7	9	19	25	20	39	52
5	20	40	120	940	880	840	34,8	23,6	64,8	05,2	56,4	75,2	
6	3	4	8	1	3	6	8	9	19	26	20	40	54
6	32	64	152	024	048	064	58,08	78,56	38,08	65,92	69,44	25,92	

4.5.7 Final Lean Canvas

Conclusions from the solution validation as well as some research done during the MVP design has led to the final iteration of the Lean Canvas for this project (Figure 20).

PROBLEM <small>List your top 1-2 problems.</small> 1. Implementation of UX changes is difficult 2. Ideation of UX changes and subsequent design is not straight-forward 3. Data is distributed across different places making it difficult to reflect on EXISTING ALTERNATIVES <small>List how these problems are solved today.</small> Avoidance of A/B testing altogether G Analytics + Optimizely	SOLUTION <small>Identify a possible solution for each problem.</small> 1. Design one-click test setups 2. Source UX ideas qualitatively 3. Provide one dashboard within Shopify	UNIQUE VALUE PROPOSITION <small>Single clear, compelling message that states why you are different and worth paying attention.</small> Increase revenue by at least 10% or pay nothing HIGH-LEVEL CONCEPT <small>List your 8 to 7 analogies (e.g. YouTube = Flickr for videos).</small> A streamlined UX A/B testing tool for CRO	UNFAIR ADVANTAGE <small>Something that cannot easily be bought or copied.</small> Combination of technical skills, marketing skills, UX knowledge and e-commerce experience	CUSTOMER SEGMENTS <small>List your target customers and users.</small> Shopify store owners
	KEY METRICS <small>List the key numbers that tell you how your business is doing.</small> Sales Trial signups Retention Free version Users Pro version rate Increased CR of customers Review rating in app store Added Value		CHANNELS <small>List your path to customers (direct or indirect).</small> Shopify App Marketplace	EARLY ADOPTERS <small>List the characteristics of your ideal customers.</small> Shops that know about CRO and A/B testing
COST STRUCTURE <small>List your best and variable costs.</small> Hosting Database 7€ monthly Hosting Dyno 14€ monthly Domain 2€ monthly Promotion Open		REVENUE STREAMS <small>List your sources of revenue.</small> Subscription of plugin (0-299€ a month)		



Figure 20 Final Lean Canvas

From the last iteration, only the UVP, the key metrics, the revenue streams and the cost structure changed. The cost structure became more precise due to the cost analysis in section 4.5.6. The revenue streams now omitted the “affiliate” revenue stream since it is not the main objective of this product. The key metrics only grew by one metric: Added Value – a sum of all increased revenue through CRObar. This can be used to instill confidence into the CRObar community amongst users as

well as potential new users. The biggest change in this iteration that was motivated by the solution validation is the UVP. Guaranteeing at least 10% to conversion keeps the app responsible to its mission and justifies a 30 day trial for users. It makes more sense because users can test in these 30 days and see for themselves if they experience an increase of at least 10%. If not, they can just uninstall the app.

5 Discussion

This chapter provides a quick recall to the research questions posed in the introduction and then concludes with a reflection of methodologies and results and ends with a future roadmap for the product.

5.1 Conclusions to Research Questions

The research questions were the following:

- RQ1: How can this idea be validated using the Lean Startup framework?
- RQ2: What does the framework for the business model for this solution look like (Lean Canvas)?

RQ1 was answered quickly in chapter 2 – Maurya’s adaption of the Lean Business framework was used to attempt to validate the initial idea. Maurya gave actionable insights at every step of the process.

RQ2 can be seen in section 4.5.7

5.2 Reflection of Methodologies and Results

This section discusses the methodologies and results of the project.

5.2.1 Methodologies

The main methodologies used in this project stemmed from Maurya’s adaption model of the Lean Startup. Maurya’s recommendation are clear and straight-forward and can easily be applied to a wide range of startups from software to hardware. Mostly, his advice is versatile and offered at the right moments in the literature. His framework is detailed and even provides the interview scripts at each point, and where to acquire interviewees.

However, at points the literature made many assumptions and deviating from the framework should be more encouraged. Overall, using Maurya’s framework made the whole project much easier. The split into different stages naturally accompanied the project management into sections with tangible goals.

The financial methodologies (break-even analysis, cash-flow analysis, etc.) all seemed out of place because they were against the Lean Startup mentality of testing iteratively rather than plan far into the future. However, they needed to be done for the pricing considerations.

The branding methodologies did not add much to the experience. Advice from fellow designers at Agency A were much more helpful. The stakeholder analysis also brought not actionable insights since the stakeholders involved in this project were not that numerous.

5.2.2 Results

The project overall seems successful. While the scope of the project wasn’t clear at all in the beginning, it quickly became clear how far into the process this thesis could document the process of

developing this product. Maurya's recommendations gave the whole project a tight structure. Luckily, the prospective customers seemed enthusiastic about the idea. Having Agency A for their experience and expertise also helped immensely.

The project also had many points that could have been done differently. One glaring shortcoming of the project was the lack of interviewees to draw any statistically worthwhile conclusions. Even the survey didn't have enough participants. In the stage after, (the solution validation stage) this was tried to be mitigated by using paid advertising to get more validation through the marketing campaign and the mock sales page. This was also a failure. The advertising budget (50€) was not enough to gain a significant number of visitors and subscribers to interview / survey. Thus, the validation of the problem as well as the conclusion utterly lacks in statistical significance. This poses a great risk to the continuation of the product development since the idea was not validated by more than five potential users. The main problem was finding willing interview partners. This could maybe be explained by shop owners not wanting to disclose their revenue freely to strangers. Maybe a different strategy could have been used in the interview acquisition process, such as cold walk-ins.

5.3 Future Roadmap

After the MVP is published and evaluated, Maurya suggests iterating until retention hits at least 40%. From there, marketing and scaling begins. For exposure, a content strategy should be put in place that promotes the topic of CRO on different platforms such as Medium, Slideshare and Twitter. The PPC ads on Facebook were not cost-effective at all and therefore not a profitable channel.

What is also interesting to research would be partnerships with other CRO apps. These apps can be integrated into the product as their own CRO testing cases. CRObar would work harmoniously as a testing tool for the other CRO apps and a partnership would allow for exposure to other audiences.

Finally, porting the app to other e-commerce platforms would allow for an even bigger market and more potential customers. In Europe, Shopify has not gained a large foothold yet and the market is dominated by Gambioshop, osCommerce, Magento and Shopware. These eCommerce platforms also have a large ecosystem that can be made use of.

6 References


- [1] <https://de.statista.com/outlook/243/100/e-commerce/weltweit#>
- [2] Eurostat :EU-28 Annual rates of change total industry MIGs NACE divisions ca 2005-2016
http://ec.europa.eu/eurostat/statistics-explained/index.php/File:EU-28_Annual_rates_of_change_total_industry_MIGs_NACE_divisions_ca_2005-2016.png
- [3] Þorsteinsson, Þorkell Viktor. "E-Commerce and its effect on retail." (2016).
- [4] Pine, B. Joseph, and James H. Gilmore. "Welcome to the experience economy." *Harvard business review* 76 (1998): 97-105.
- [5] Moshrefjavadi, Mohammad Hossein, et al. "An analysis of factors affecting on online shopping behavior of consumers." *International Journal of Marketing Studies* 4.5 (2012): 81.
- [6] Ramakrishnan, Thiagarajan, Mary C. Jones, and Anna Sidorova. "Factors influencing business intelligence (BI) data collection strategies: An empirical investigation." *Decision Support Systems* 52.2 (2012): 486-496.
- [7] Saleh, Khalid, and Ayat Shukairy. Conversion optimization: The art and science of converting prospects to customers. " O'Reilly Media, Inc.", 2010.
- [8] "Definition of: SaaS". *PC Magazine Encyclopedia*. [Ziff Davis](http://www.pcmag.com/encyclopedia/entry/SaaS). Retrieved 14 May 2014.
- [9] Grandon, Elizabeth E., and J. Michael Pearson. "Electronic commerce adoption: an empirical study of small and medium US businesses." *Information & management* 42.1 (2004): 197-216.
- [10] Fox, Armando, David A. Patterson, and Samuel Joseph. *Engineering software as a service: an agile approach using cloud computing*. Strawberry Canyon LLC, 2013.
- [11] Ries, Eric. *The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses*. Crown Business, 2011.
- [12] Womack, James P.; Jones, Daniel T.; Roos, Daniel (1990). *The machine that changed the world: based on the Massachusetts Institute of Technology 5-million dollar 5-year study on the future of the automobile*. New York: Rawson Associates. ISBN 0892563508. OCLC 21977626.
- [13] Blank, Steve. "Why the lean start-up changes everything." *Harvard business review* 91.5 (2013): 63-72.
- [14] eMarketer. "E-commerce Share of Total Global Retail Sales from 2015 to 2020." Statista - The Statistics Portal, Statista, www.statista.com/statistics/534123/e-commerce-share-of-retail-sales-worldwide/, Accessed 18 Apr 2017
- [17] Catalin Zorzini, "All Ecommerce Platforms and Shopping Cart Software: 120 and Counting", ecommerce platforms <http://ecommerce-platforms.com/articles/shopping-carts-software-ecommerce-platforms>
- [15] Verhoef, Peter C., et al. "Customer experience creation: Determinants, dynamics and management strategies." *Journal of retailing* 85.1 (2009): 31-41.
- [18] Ecommerce Wiki." Global B2C Ecommerce Report"
https://www.ecommercewiki.org/wikis/www.ecommercewiki.org/images/5/56/Global_B2C_Ecommerce_Report_2016.pdf
- [16] Kahled, Saleh and Shukairy, Ayat (2011). *Conversion Optimization: The Art and Science of Converting Prospects into Customers*, p. 2. O'Reilly Media, Sebastopol.
- [19] George Anders, "E-Commerce Platforms Software" <https://www.g2crowd.com/categories/e-commerce-platforms>
- [20] Shopify, <https://www.shopify.com/online/ecommerce-solutions>
- [21] SEO Manager, Shopify app marketplace, <https://apps.shopify.com/seo-meta-manager>
- [22] Buildwith, "Websites built with shopifx" <https://trends.builtwith.com/shop/Shopify>
- [23] Maurya, Ash. *Running lean: iterate from plan A to a plan that works*. " O'Reilly Media, Inc.", 2012.
- [24] Kohavi, Ron; Longbotham, Roger (2015). "Online Controlled Experiments and A/B Tests". In Sammut, Claude; Webb, Geoff. *Encyclopedia of Machine Learning and Data Mining* (PDF). Springer. pp. to appear.
- [25] Buildwith, "Websites built with shopware" <https://trends.builtwith.com/shop/Shopware>
- [26] Cooper, Robert G., and Elko J. Kleinschmidt. "Benchmarking the firm's critical success factors in new product development." *Journal of product innovation management* 12.5 (1995): 374-391.
- [27] Experimentor, Shopify app marketplace, <https://apps.shopify.com/experimentor>
- [28] Splittest, Shopify app marketplace, <https://apps.shopify.com/splittest>
- [29] Shane Baker, "Your Step-by-Step Guide to A/B Testing with Google Analytics" <https://www.crazyegg.com/blog/ab-testing-google-analytics/>
- [30] Convertize, <https://www.convertize.io/>
- [31] Optimizely, <https://www.optimizely.com/>
- [32] Wishpond, "50 A/B split test conversion optimization cases" <http://blog.wishpond.com/post/98235786280/50-a-b-split-test-conversion-optimization-case-studies>
- [33] <https://drive.google.com/drive/folders/0B9kPz-DbVkiusMHdGVkpWZURFSXc?usp=sharing>
- [34] <https://docs.google.com/forms/d/14Otr7bB6EMeTX7TpTwH9mJOYRxGtPBMuGqf6apEp-8/edit?usp=sharing>
- [35] Bodnar, Kipp, and Jeffrey L. Cohen. *The B2B social media book: Become a marketing superstar by generating leads with Blogging, LinkedIn, Twitter, Facebook, Email, and more*. John Wiley & Sons, 2011.
- [36] Osterwalder, Alexander, et al. *Value proposition design: How to create products and services customers want*. John Wiley & Sons, 2014.
- [37] Neil Patel, "Landing Page Design Infographic" <https://blog.kissmetrics.com/landing-page-design-infographic/>
- [38] Spruit, Marco, and Nizar Abdat. "The Pricing Strategy Guideline Framework for SaaS Vendors." *International Journal of Strategic Information Technology and Applications (IJSITA)* 3.1 (2012): 38-53.
- [39] Fry, Joseph N., and John D. Claxton. "Semantic differential and nonmetric multidimensional scaling descriptions of brand images." *Journal of Marketing Research* 8.2 (1971): 238-240.
- [40] Klaviyo, <https://www.klaviyo.com/pricing>
- [41] Bigcommerce, "Conversion Rate Optimization" <https://www.bigcommerce.com/blog/conversion-rate-optimization/>
- [42] "Identifying and analyzing stakeholders and their interests", <http://ctb.ku.edu/en/tableof-contents/participation/encouraging-involvement/identify-stakeholders/main> [Online; accessed 3-August-2016]

[43] Wiegers, Karl, and Joy Beatty. *Software requirements*. Pearson Education, 2013.

[44] Müller-Brockmann, Josef. "Grid systems." *Alemanha, Editora Braun* (1996).

[45] Purchase, Helen C., et al. "UML class diagram syntax: an empirical study of comprehension." *Proceedings of the 2001 Asia-Pacific symposium on Information visualisation-Volume 9*. Australian Computer Society, Inc., 2001.

7 Appendix



CROBAR

Current Hypothesis
"Changing the replacing the cart symbol with 'Buy Now' will increase the CR"

Test active Cancel test Implement now

70
more conversions until significance level (97%) is reached

12%
A Control
24 conversions

14%
B Variation
28 conversions
+17%!

Browse Tests

Archived Tests

Settings

Img

Img

"Adding an SSL symbol to the top bar will increase the CR"

Img

Img

"Implementing a 'free shipping'-bar will increase the CR"

Img

Img

+11%
more avg. gain by other CROBar users

+2396€ / mo
potential increase in revenue

+8% / mo
more avg. gain by other CROBar users

+1743€
potential increase in revenue


+6% / mo
more avg. gain by other CROBar users

+1306€
potential increase in revenue

Test now

Test now

Test now



CROBAR

Current Hypothesis
"Changing the replacing the cart symbol with 'Buy Now' will increase the CR"

Test active Cancel test Implement now

70
more conversions until significance level (97%) is reached

12%
A Control
24 conversions

14%
B Variation
28 conversions
+17%!

Browse Tests

Archived Tests

Settings

Img

Img

"Show 'add another one' prompt after add-to-cart action will increase the CR"

Img

Img

"Changing the add-to-cart button will increase CR"


+12%
increase in CR

+6396€
calculated total increased revenue

-2%
Decrease in CR

Implemented

Not implemented



CROBAR

Current Hypothesis
"Changing the replacing the cart symbol with 'Buy Now' will increase the CR"

Test active Cancel test Implement now

70
more conversions until significance level (97%) is reached

12%
A Control
24 conversions

14%
B Variation
28 conversions
+17%!

Browse Tests

Archived Tests

Settings

Settings

Subscription valid until 24-07-2017 and will automatically renew every 30 days

97

90 ————— 99

Statistical significance (97% recommended)

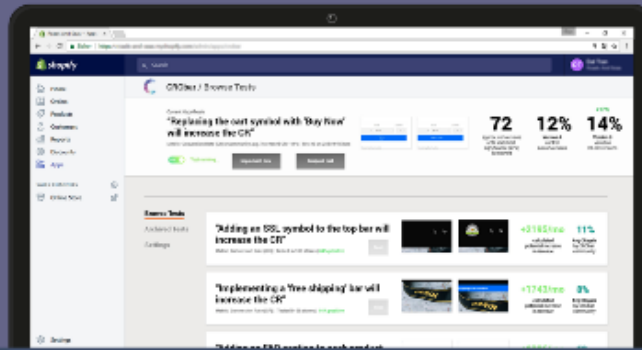
50

0 ————— 99

Test population of total visitors (50% recommended)

Easy UX A/B Tests

Setup community reviewed split tests in a matter of seconds!



Features

Here's Why CRObar will change your optimization game.

CHOOSE FROM PRE-DESIGNED TESTS

We cover basic feedback. We design and implement all the tests for you - all you need to do is implement the test with a few clicks!

AUTOMATIC IMPLEMENTATION

We'll set up a live split A/B testing, and automatically implement the tests. You can then see how your site is performing in the dashboard.

ALWAYS BE TESTING

We'll suggest tests that are constantly running on your site to help raise your conversion rate. Our users see an average increase of 10% in their conversion rate!

TRANSPARENT PRICING PLANS

Here's our always straight forward, well thought out, pricing plan below.

[ADD TO STOREY](#)

What Our Users Say

Don't Just Take Our Word For It, Read It From Them

RICHARD WHEELER, shopify entrepreneur

"We'd be so grateful for any help we can get to help our CRObar because it's just so much of a pain to set up. We simply loved the interface and the ease of use. We've used CRObar and had an increase of 12% in conversion!"

ELEANOR KELLEY, shopify operator

"I love the interface and the ease of use. I've used CRObar and had an increase of 12% in conversion. I've used CRObar and had an increase of 12% in conversion."

CLIFFORD HANSON, store owner

"I've been using CRObar before but it was so hard to set up. I've used CRObar and had an increase of 12% in conversion. I've used CRObar and had an increase of 12% in conversion."

EDITH GOMEZ, shopify entrepreneur

"I love the interface and the ease of use. I've used CRObar and had an increase of 12% in conversion. I've used CRObar and had an increase of 12% in conversion."

Flexible Pricing Plans

We Have Pricing Plans To Suit Every Website Need

HOBBYIST



free

5 main conversion goals
up to 5k monthly visitors
community support

BUSINESS



\$25

access to 100+ tests
up to 25k monthly visitors
includes email support

ENTERPRISE



\$50

access to all tests
unlimited monthly visitors
includes priority email support