Social smartphone app for personalized recommendation of local experiences

Jesper Jarlskov

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Technical University of Denmark
Informatics and Mathematical Modelling
Building 321, DK-2800 Kongens Lyngby, Denmark
Phone +45 45253351, Fax +45 45882673
reception@imm.dtu.dk
www.imm.dtu.dk IMM-M.Sc-2013-43

Summary

The goal of this thesis is to define the business model for a business helping people find the most relevant nightlife spots based on their personal preferences and social relationships. The business model is created using effectuation, an adaptive iterative decision-making process which is used to improve business models based on direct involvement from customers and other stakeholders. The main output of the thesis is a business model, as well as the system design for an online recommender system, fulfilling the requirements of the business model. The system design is ready to be turned into a working prototype and, through an agile process involving the potential customers, a fully working platform.

Resumé

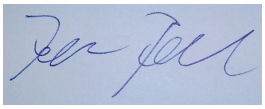
Målet for denne afhandling er at beskrive forretningsmodellen for en virksomhed hvis formål er at hjælpe folk med at finde de steder at gå i byen der er mest relevante for dem, ud fra deres personlige præferencer og sociale relationer. Forretningsmodellen bliver lavet vha effectuation, en adaptiv og iterativ beslutningstagningsproces, der bruges til at skabe forretningsmodeller i tæt samarbejde med kunder og andre samarbejdspartnere. Projektets primære produkt vil være en forretningsmodel, samt et systemdesign af et online anbefalingssystem der lever op til forretningsmodellens krav. Systemdesignet vil være klar til at der kan laves en fungerende prototype og, igennem en agil proces der involverer potentielle kunder, også en fuldt fungerende platform.

Preface

This thesis was prepared at the department of Informatics and Mathematical Modelling at the Technical University of Denmark in fulfillment of the requirements for acquiring an M.Sc. in Informatics. It contains work conducted from February to June 2013 in collaboration with my supervisor Michael Kai Petersen.

The thesis deals with the subject of helping people make sense of the enormous amounts of data available online. It focuses on data about nightlife and tries to create a business model and the main product for a business whose goal is to help curate the data to fit the preferences and habits of the individual, to provide the customers with better nights out.

Lyngby, 09-June-2013



Jesper Jarlskov

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Chapter 1

Introduction

Today vast amounts of data about everything is available online, too much data for one person to process. For example more than 72 hours of video is uploaded to YouTube every minute[1] and more than 41 mio blog posts are posted on WordPress.com every month[2], creating a sort of information overload. To solve this problem of information overload, recommender systems are being created to help people find the information they are searching for. A lot of data is also available online about the subject of nightlife e.g. Foursquare alone has 1.3 mio claimed venues[3], but even with the current recommender systems, it is easy to get into a filter bubble and focus on the same few venues that you already know and never learn about new ones. Initial research has shown more than 100.000 monthly searches are conducted for a number of nightlife related search terms used to search for bars in various parts of Copenhagen, which shows an interest in finding info about nightlife venues online.

In real life a similar problem exists with new bars opening and old bars closing, but the mentioned recommender systems is not available in an offline context. Here a popular alternative way to learn about new venues is recommendations from friends, a sort of social curation.

[1] http://www.youtube.com/yt/press/statistics.html
[2] http://en.wordpress.com/stats/
[3] http://blog.foursquare.com/2013/04/11/continuing-foursquares-growth/

Using the social data available online this project aims to create an online recommender system to provide personalized suggestions for places to go out. This will be a form of automated social curation to help people have better nights out. Danish people spend a lot of money on going out each year, with bars, pubs and similar having a turnover of more than 5 billion DKK in 2011[Hor12]. The created recommender system will be the foundation for a business with the purpose of helping the people searching for nightlife venues online find venues matching their preferences and what their friends are doing, and try to gain a share of the 5 billion DKK doing so.

The main goal of the project, and the business defined therein, is to help people have better nights out. This can mean different things to different people; for some it means cheap beer, for others it means playing pool with friends, and for others again it means dancing all night. All these different preferences underlines the importance of offering services personalized to the individual.

The paper is divided into three main chapters:

- Theory
- Design
- Implementation

Theory The theory chapter introduces three models. The first model describes a set of decision-making principles for building businesses and product designs. The second model helps define and improve upon dynamic business models and the last model describes a range of external factors influencing businesses.

Design In the design chapter the goal of helping people find better nights out are taken through three iterations. The first iteration introduces a platform for collecting data about bars from existing sources and using crowdsourcing. The second iteration adds a layer of social and real-time data to the platform, and takes the initial steps towards a system design for the application. The third iteration introduces a new customer segment, adding new revenue streams to the business model.

Implementation In the last chapter the system designed through the three business development iterations is finished. The chapter will introduce a number

of system design principles that will be used as the base for developing the final product required to solve the problem of helping people have better nights out.

Summary The nightlife in most major cities offers too many choices for most people to get an overview of. Localpub provides a platform that analyzes your social network to learn what you and your friends like to do when going out. This helps personalize the nightlife experience and helps you have better nights out.

Chapter 2

Theory

This chapter will lay the theoretical foundation for the business development done through the paper, and the design of the business' main product.

The first section introduces the concept of effectuation, a set of decision-making principles employed by entrepreneurs in situations of uncertainty. The section also gives an introduction to the effectual cycle, which is a series of steps that can be employed in order to move a business further, based on goals that are achievable at the time. The outline of the business model design chapter will be based on this cycle.

In the second section Osterwalder's business model canvas will be introduced, as a way to create an overview of a business model and define the requirements for one such. It will also quickly tap upon a few things Osterwalder's model does not provide answers for.

In the last chapter a model for evaluating the external environment surrounding a business is introduced. The model looks at the Social, Legal, Environmental, Political and Technological (SLEPT) factors influencing a business.

2.1 Effectuation

Traditionally most organizations try to reduce risk by thoroughly analyzing the market before starting a new venture. This causal wisdom says that removing uncertainty helps reduce risk.

Another school of thought is the one used in effectuation, a theory created by Saras D. Sarasvathy, research associate professor of business administration at University of Virginia. Instead of trying to predict the far future by knowing about the past, effectuation focus on controlling the future by utilizing knowledge and resources available now. Effectuation use short iterations to move the business towards it's goal in small steps by only considering data that can be of use instantly to determine in which direction the business should go. An effectual startup will not have a specific long-term goal, but will rather have a broader goal, for example solving a specific problem[Sar01].

Effectuation uses the resources available right now to decide on the next step. This prevents a business from suddenly stranding e.g. because a partnership deal does not go through, by allowing the business to change it's direction as soon as the negotiations fail.

> "Definition: Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means."[Sar01]

The broadly defined goal also allows a business to pivot if the risk of failure gets too big. An example is the company Tune In Hook Up that started as a video dating service. When the service failed to gain traction, they decided to take their existing video sharing technology and pivot the business to focus broader on video sharing. This became the Company called YouTube that was later sold to Google for $1.65 billion[1].

Using a system like effectuation is good for projects like startups that need to be agile in a changing environment like the one described in this project. It is worth noting though, that this flexibility is not desirable to all projects, eg. it will be hard to run a large construction problem like the Copenhagen Metro as an iterative process since the goal is well-defined and does not leave room for

[1] http://usatoday30.usatoday.com/tech/news/2006-10-11-youtube-karim_x.htm

adaption. At the same time it is extremely expensive to change plans as soon as the digging has started.

2.1.1 Principles of effectuation

Effectuation comprises five principles that together make up what is called effectual logic. The five principles are:

- Bird-in-hand
- Affordable loss
- Lemonade
- Patchwork quilt
- Pilot in the plane

Bird-in-hand Effectuation is not about pre-setting big goals, rather it is about starting with your means. These means are:

- Who I am
- What I know
- Who I know

This allows practitioners of effectuation to focus on what is actually achievable right now. This is known as the bird-in-hand principle.[SR11, 72-95]

Affordable loss By knowing what you can afford to lose, it is possible to make decisions that has an upside even in the worst-case scenario. This contrasts the causal wisdom where a lot of resources are usually spent analyzing the future, before a decision is made. This is known as the affordable loss principle.[SR11, 96-104]

Lemonade Causal thinking focuses on trying to predict the future, in order to minimize the risk and the effect of unexpected outcomes. Effectual thinkers realize that the future can never be predicted, and instead of spending time on a lot of what-if scenarios, they focus on spotting surprises as early as possible, and find ways to incorporate these into their plans.[SR11, 140-150]

Quickly responding to unexpected changes in the environment and leveraging surprises is know as the lemonade principle.

Patchwork quilt Causal business logic often works with an "us against them" mentality, where all other players in a market is seen as competitors. Effectual entrepreneurs try to establish partnerships with interested stakeholders. Few established businesses will be interested in partnering with direct competitors, but strategic partnerships can create completely new markets for the effectual entrepreneur, which could not be utilized without an established partner. Creating new opportunities by building partnerships is the patchwork quilt principle.[SR11, 113-124]

> "Effectuation emphasizes strategic alliances and precommitments from stakeholders as a way to reduce and/or eliminate uncertainty and to erect entry barriers."[Sar01, p.252]

Pilot in the plane Instead of predicting the future, effectual entrepreneurship focuses on controlling the future by doing actions with a known outcome. This pilot in the plane principle allows the effectual entrepreneur to directly control the here and now, as well as the near future, instead of preparing for what might happen in the future.[SR11, 173-186]

2.1.2 The effectual cycle

Effectual business development consists of short iterations that takes an idea towards it's goal one step at a time. Sarasvathy defines the cycle that is repeated in each of these iterations as the effectual cycle[SR11, Part II] which can be seen in figure 2.1 on the facing page. The cycle consists of five steps:

1. Assess available means
2. Set goals

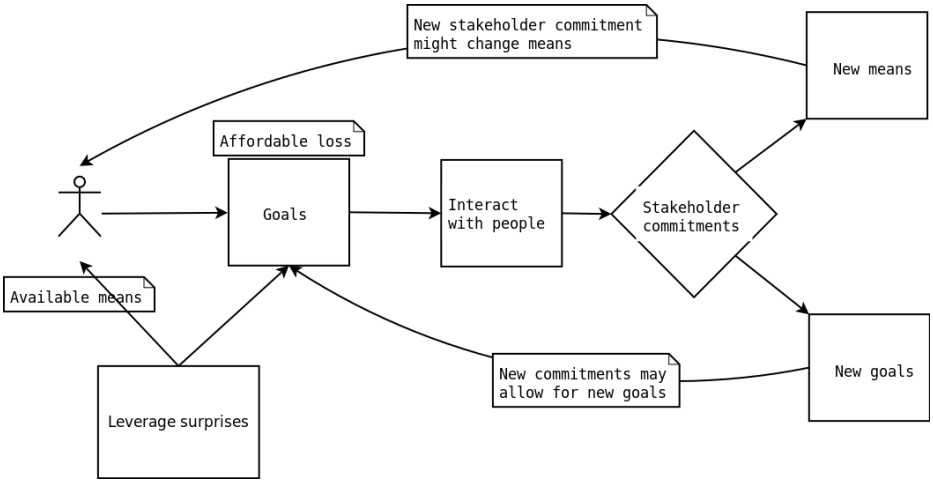

Figure 2.1: The effectuation cycle outlining the steps for each iteration of the effectuation process. [Image courtesy of: http://www.brocooli.com/schematiser-modele-economique/]

3. Interact with people
4. Get stakeholder commitments
5. Investigate possible futures
    - Collect new means
    - Set new goals

In the fifth step a choice is made about how to start the next iteration, based on what has been learned during the iteration. I have named this step 'possible futures' to keep a consistent name for the step through the project.

Available means In the first step the entrepreneur takes a look at his or their current means as defined by the bird in hand principle. This step clarifies what is actually possible at that time.

Goals Based on the available means, the second step focuses on setting some goals for the iteration. These goals must be achievable with the current means, and must be within the entrepreneurs affordable loss. Working directly from the available means, ensures that goal setting and achievement is closely related.

Interact with people In the third step the entrepreneur must interact with people. This is to make sure that the goals achieved will actually be of interest to the target customers and partners.

Stakeholder commitments The fourth step focus on gathering stakeholder commitments. This can be buy-in from customers which proves that a product can actually be sold, or it can be a partnership being formed.

> "Traditionally businesses try to find and predict markets. Effectuation gets stakeholders with strong buy-in, to create a market."[Sar01, p.252]

Possible futures In the fifth and last step of the iteration everything that has been learned from the stakeholder interactions is analyzed. Based on the feedback from the stakeholders the entrepreneur takes stock of the possibilities for moving on. Either new means has been gathered creating new business opportunities, or new goals must be set based on stakeholder feedback.

The goal of this project is widely defined as "helping people have better nights out", without a predefined solution. This makes it a good project to solve using an effectual process, which is the reason that the effectual cycle has been chosen as the method for structuring the development of a solution for this problem.

2.2 Osterwalder's business model canvas

The business model canvas created by Osterwalder[Ost10] makes discussing business models easier in two ways.

1. It defines a common vocabulary for discussing various aspects of a business model.
2. It makes it easy to create a dynamic visual overview of a business model.

When discussing business ideas, it is important to have a well-defined vocabulary. For example a business' "key resources" may mean different things to people in marketing than to people in engineering. Osterwalder provides a well-defined vocabulary making it easier to discuss a business model with people of different backgrounds.

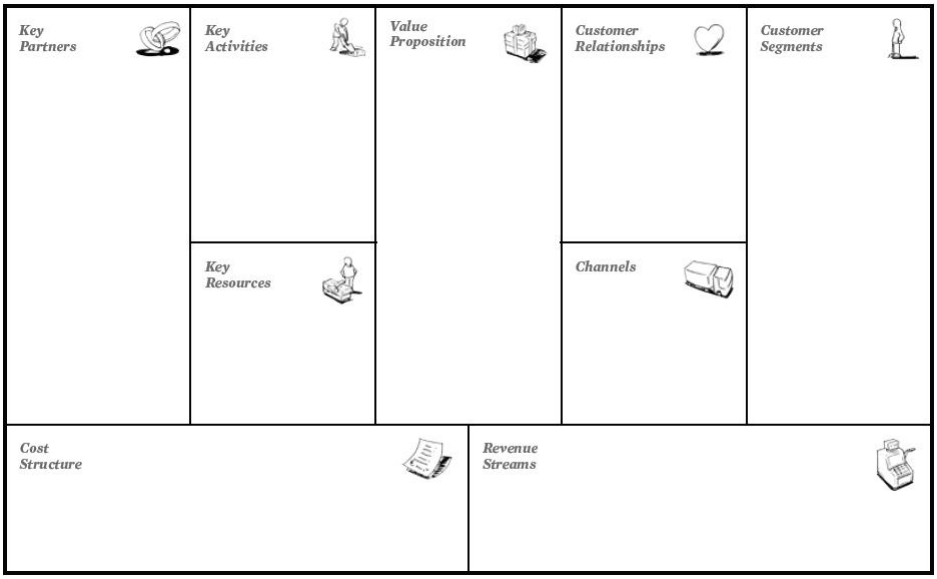

Figure 2.2: Osterwalder's business model canvas. The canvas consists of nine building blocks each containing different aspects of a business model.

Osterwalder's model is based upon the business model canvas shown in figure 2.2. It consists of the nine blocks shown in the figure, and all major business aspects are placed in one block each. This provides a visual overview of the business model, and makes it simpler to see the influence changes to different aspect will have on the business model at large. The following section will give a brief description of each of the nine blocks.

2.2.1 Building blocks

The canvas can be divided in two parts. The left-hand side is the internal business components. This holds the business infrastructure and processes needed to create value for the customers. The right-hand side is the customer-focused blocks which defines the customers the business is creating value for, it also tells how to reach these customers. The central block is the value proposition which is both part of the left- and right-hand side of the canvas, underlining the importance of this block.

Customer segments The customer segments building block defines the target customers for the business. The main purpose of a business is to solve a problem for one or more groups of people. These groups are defined in the customer segments building block.[Ost10, p. 20-21]

Value proposition The value proposition building block describes the bundle of benefits that a business is offering to it's customer segments. Different customer segments has different needs, so it is important to provide value propositions that cater for all customer segments.[Ost10, p. 22-25]

Channels The channels building block defines the business' interface with it's customers. This building block shows how the business expects to communicate with it's customers, and how it will deliver the value proposition. The channels has a many-to-many relationship with the customer segments. This means that each channel can reach more than one customer segment, at the same time one customer segment can be reached through several channels.[Ost10, p. 26-27]

Customer relationships This building block defines the relationship the business will establish with it's customer segments. Like the channels, there is a many-to-many relationship between customer segments and the customer relationships.[Ost10, p. 28-29]

Revenue streams The four blocks described so far is the blocks on the right-hand side of the canvas, the customer-focused side. This is the side where the business provides value to it's customers and it is the interaction between these blocks that is used to define how the business generates revenue, which is summarized in the revenue streams block.[Ost10, p. 30-33]

Key resources key resources are the resources that is absolutely necessary for a business to be able to fulfill it's value propositions. This can be resources like people, machines or intellectual property.[Ost10, p. 34-35]

Key activities The key activities are closely related to the key resources. This block defines the activities required for the business to fulfill it's value propositions. For a production company, the actual production is a key activity.[Ost10, p. 36-37]

Key partners Strategic partnerships can be important to gain access to required resources, or to outsource activities thus allowing the company to focus on fulfilling it's value propositions.[Ost10, p. 38-39]

Cost structure The three previous blocks, together with the value proposition makes up the left-hand side of the business model canvas, defining how the business works internally. The major costs of running the business will be found in these blocks and together they form the cost structure.[Ost10, p. 40-41]

2.2.2 Shortcomings

Osterwalder's canvas gives a good overview of how a business works internally, and it shows the main parts of the business model. It also helps visualize the impact of moving an element to another block or choosing specific blocks to focus on as well as how different blocks influence each other.

What Osterwalder's model does not do though, is to look at the external factors that influence a business. This is part of what differentiates Osterwalder's model from e.g. Porter's five forces. Porter talks about the five external forces in a market[Cha09, p. 276-277, 303, 348-349, 350, 351]:

- Threat of new entrants
- Threat of substitute products or services
- Bargaining power of customers
- Bargaining power of suppliers
- Intensity of competitive rivalry

This is two different ways to look at business models, where Porter bases his model on existing markets, while Osterwalder's model focuses on the business model itself.

This project will be based on Osterwalder's business model generation, rather than Porter's investigation of existing markets, because Osterwalder's dynamic nature makes it a good fit when working with the effectual principles of maneuvering in an ever-changing environment. Since no business can exist without outside influence, existing competition will also be a subject of investigation, even though it is not a part of Osterwalder's model.

The next section will introduce the SLEPT model as a way to analyze the external factors influencing a business. This will be used as a supplement to Osterwalder's model which mostly focuses on the internals of a business model. Osterwalder's business canvas, the SLEPT model and the mentioned competitor analysis will be used to try to cover the entire market the business will be working in.

2.3 External factors

Osterwalder mainly focuses on the internal working of a business model, thus other models must be used for understanding the external factors.

One model used to describe the external factors, is the SLEPT model[Cha09, ch. 4] which is seen in figure 2.3 on the facing page. The SLEPT model consists of:

- Social factors
- Legal factors
- Economical factors
- Political factors
- Technological factors

The actual impact of each factor depends on the business, but each concept will be discussed in general terms.

Social factors The social factors include all of the cultural aspects and demographics influencing a business. A social factor could be the technological readiness of a population, a thing that is important for many tech companies.

Legal factors Legal aspects is all aspects regarding the law regulating the area and market the business is operating in. This includes consumer laws, antitrust laws and employment laws. Privacy and marketing laws are examples of legal aspects that is often very important to online and high-tech companies.

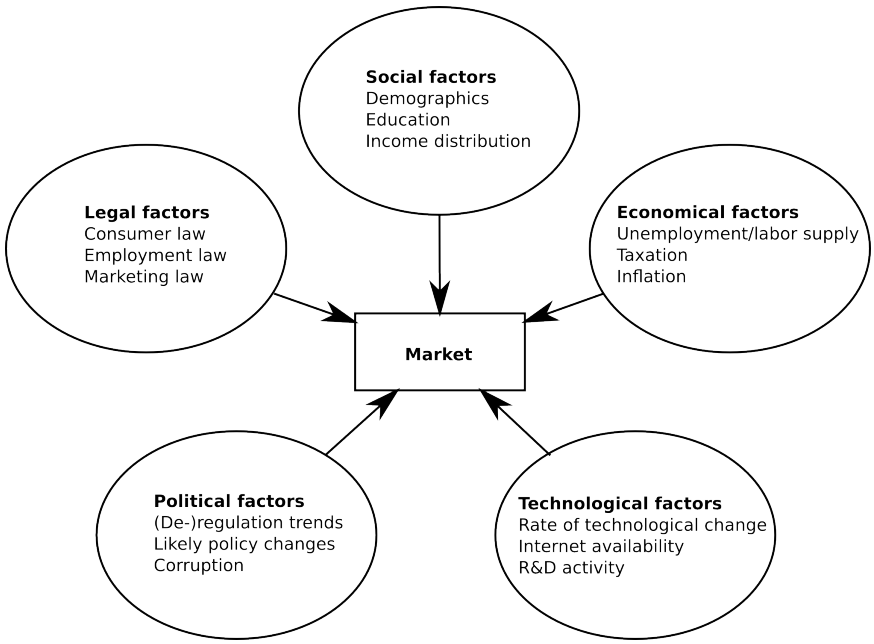

Figure 2.3: Overview of the SLEPT model with the five factors influencing a market, and examples of aspects for each factor.

Economical factors The economical factors include things like economic growth and inflation that influences people's ability to spend money, as well as people's expectations to the economical growth that influences people's willingness to spend money.

Political factors The political aspects focus on the degree and possibility of government intervention. Things like infrastructure investments and education, is important to many companies.

Technological factors Technological aspects includes the amount of R&D being conducted in an area, as well as the rate of technological change. These factors influence the barriers of entry into a technological market, and also plays an important role in outsourcing decisions.

The SLEPT model makes a good addition to Osterwalder's business canvas by contributing a perspective on the external factors to accompany Osterwalder's internal focus, thus including concepts from both models help create a more

comprehensive view of the business model and the market it's performing in.

2.4 Summarizing

This chapter has introduced the basic theory that will serve as the foundation for the next chapter where a business model will be developed. First the chapter introduced effectuation, and the next chapter will consist of three iterations, each going through the steps of the effectual cycle, each iteration will be based on a business model described in Osterwalder's canvas. The goal of each iteration is to improve upon the business model by analyzing the interaction between different aspects of the model, and tweak each element based on the principles of effectuation. The SLEPT model will be used as a supplement to Osterwalder's business canvas to create an overview of the external factors influencing the business.

In the final chapter the business model is used as a base for creating a system design for a product that is ready to be built and taken to market to fulfill the goals of the defined business.

Chapter 3

Design

The previous chapter provided an introduction to effectual entrepreneurship and Osterwalder's business canvas. These two concepts will form the basis for this chapter, which will design a business model for a business with the goal of helping people have better nights out.

This chapter will go through three iterations in which the business model is created. In the first iteration a general idea is outlined. In the second iteration the idea is improved upon, and a system design for a product based on the business model is outlined. In the third iteration the final changes are made to the business model and the main revenue streams are introduced.

Each iteration is based on the effectual cycle introduced in chapter 2.1.2 on page 8 and will consist of three main parts.

First part summarizes the current state of the project, and which means are available. Based on this, some immediately achievable goals are set up for the iteration.

In the second part, the stakeholders are consulted. First input is sought from the target customers on whether the goals are relevant to them and afterwards partners are consulted to figure out what they can offer to improve the product based on the customer feedback.

In the last part, the entire iteration is summarized, and a number of possibilities for taking the business to the next level is discussed. A number of possible ways to improve the business is presented either by suggesting new goals, or by utilizing some new means found during the iteration. In the end one of these possibilities is chosen as the foundation for the following iteration.

Each iteration will be based on a business model canvas. Each time an entity from the canvas is mentioned, it will be referenced by showing it's corresponding number in parenthesis.

3.1 Iteration 1 - Introducing the platform

The goal of the project is to provide people with a way to have better nights out. This first iteration will outline an idea for a platform to help reach this goal.

The structure of each iteration is based on the effectual cycle:

1. Summarize available means
2. Define goals for the iteration based on the means
3. Interact with current or potential customers
4. Obtain buy-in from additional stakeholders
5. Decide on the next steps for the business

The first iteration will be based on the business model canvas of figure 3.1 on the facing page.

3.1.1 Means

First, a foundation for the idea is created by looking at the available means.

Who I am I am a Copenhagener and bargoer. I enjoy exploring the city and find new places where I can enjoy an evening with friends.

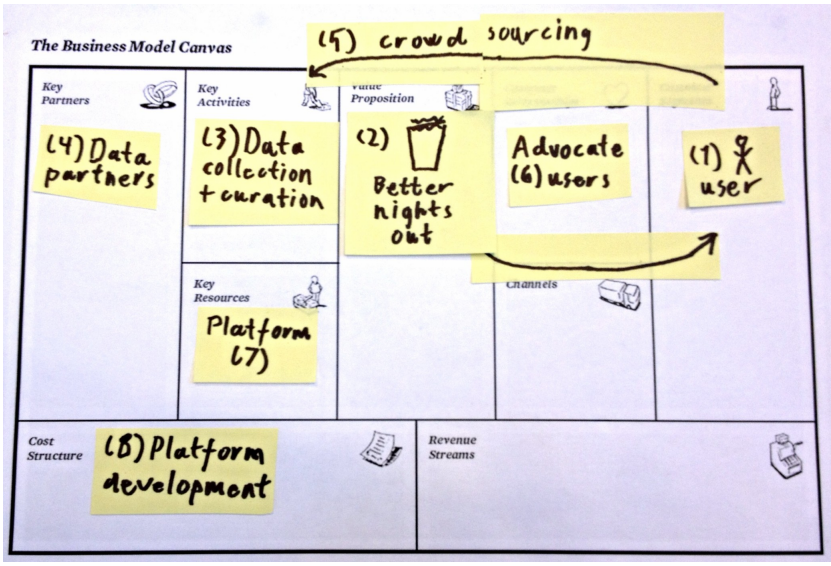

Figure 3.1: Business canvas for the first iteration, the numbers in parenthesis are used as reference through the chapter.

What do I know? I am a developer of web and mobile services, so I will be able to build prototypes to try out new ideas, as well as build fully working products. I also have experience building products that interacts with other services through their APIs (application programming interfaces), which is interfaces services has for external systems to interact with them.

Who do I know? A lot of my friends are also bargoers, as well as avid pool players, table football players or followers of televised sport events. Many of them also enjoys visiting various bars around the city.

Besides people, I follow the scene of social media services many of which are collecting vast amounts of data about business establishments all over the world.

3.1.2 Goals

The means show a lot of available knowledge about bars and clubs. With the overall goal being to help people(1) have better nights out(2), and programming skills as available means, one way of achieving the goal could be to create a platform that acts as a connector between the knowledge available, and the people

seeking this knowledge. Being able to build the initial platform myself means that the largest expense will be in the form of time, making it an affordable loss.

3.1.2.1 Recommender system

The platform will function as a recommender system.

> "Recommender systems are software tools and techniques providing suggestions for items to be of use to a user."[Ric08]

Traditionally recommender systems are either based on collaborative filtering, or content-based filtering. More and more recommender systems are also starting to combine the two approaches to create hybrid systems. [Ric08, ch. 1] [Var99] [Gro10]

Collaborative filtering In collaborative filtering user behavior and preferences are used to predict what users will like based on how similar they are to other users. Amazon's "Customers who bought this item also bought" functionality is an example of collaborative filtering.

Content-based filtering Content-based filtering looks at attributes of the actual items instead of the users. If a user is looking at a music album, a related item could be another album from the same artist, or if a person likes a specific smoking pub which has a pool table, a similar item could be another smoking bar a few streets down with a billiards table.

Building a platform like this requires a lot of data collection(3). This will come from two sources:

- Partner data (APIs)
- Crowdsourcing

3.1.2.2 Partner data

A lot of the required data is already available online, but there are two problems with the current availability.

The first problem, is that the data is scattered across a range of services which functions as data silos. Providing a single platform where all of this data can be found would provide additional value to people who needs the data. This is also a form of partnership with existing competitors, using the patchwork quilt principle of effectuation.

The second problem is that all of these data providers are collecting data for all kinds of businesses all over the world. So an added service would be curating the data to provide only the data of interest to the niche of users wanting to go to bars in specific cities or areas of those cities.

The currently available data can be gathered using APIs provided by data partners(4). An API provides a point of interaction between the data provider, and external developers. The main data providers for this purpose are:

- Yelp
- Foursquare
- Google

Yelp The Yelp API documentation[1] describes two interesting API endpoints, search and business.

The search endpoint makes it possible to search in Yelp's venue database. It is possible to search for terms, categories and locations, and Yelp will return up to 40 venues matching the search terms.

Yelp's business endpoint provides base data about a specific business in Yelps database like:

- photos
- opening hours
- ratings
- user reviews

[1] http://www.yelp.com/developers/documentation

Foursquare Foursquare[2] also provides a range of interesting API endpoints.

The Foursquare venue endpoint is similar to Yelp's business endpoint. On top of data similar to what is provided by Yelp, Foursquare's venue endpoint also provides some basic information about:

- pricing
- specials
- who is currently at the venue

The API also contains some user provided information about the venue in the form of user tips. These tips tells something about what guests think of the venue.

Foursquare also uses a concept called lists. This allows a user to curate lists of venues, e.g. places the user would like to visit, or previously visited venues the user feels are related. This can help provide some information about which places might be similar to each other, which is useful information when suggesting new places to people.

Google Google continuously crawls the internet for all available information. This allows them to find information not provided by the other APIs. Google provides their Places API[3] which has two interesting endpoints.

The Place details is similar to the Fourquare venue, and Yelp business endpoints, in that it provides base information about venues. This includes information about events going on at the location, the opening hours as well as reviews found on the internet, these reviews are also summed up in a rating.

Google also provides image search, a large database of indexed images and photos. Some of these photos are connected to locations or businesses, and Google provides easy access to these images through the Google Places - Place Photos endpoint.

[2] https://developer.foursquare.com/overview/
[3] https://developers.google.com/places/documentation/

3.1.2.3 Crowdsourcing

> "Crowdsourcing is an online, distributed problem-solving and production model."[Bra08]

Like outsourcing, crowdsourcing, is about delegating tasks to third parties, but where outsourcing delegates tasks to one, or a few third parties, crowdsourcing outsources tasks to a lot of third parties, often the entire internet[How06].

WikiPedia might be the most well-known case of successful crowdsourcing. The WikiPedia project has crowdsourced the process of gathering and curating knowledge in an encyclopedia, and has been so successful that the accuracy can match that of accredited Encyclopedia Britannica[Gil05].

Utilizing crowdsourcing can both allow people to peer review the information already gathered about the venues(5), as well as add additional information not readily available from the discussed APIs, such as features like pool tables or happy hours offered by the venues. Furthermore having users help curate the information gathered by the platform will help create a sense of ownership which can get users to play the role of advocates and promote the service to their friends(6).

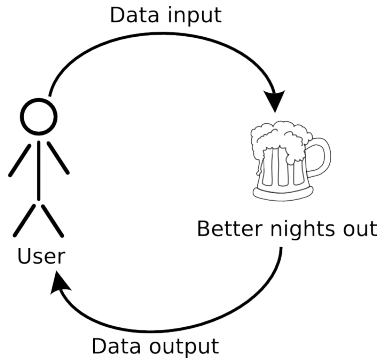

Figure 3.2: Positive feedback loop. When users input more data, the platform's value increases.

Network effects Crowdsourcing will also create network effects, in the form of positive feedback loops. Network effects is the concept of demand-side economies of scale, this means that the value of a product or service is dependent on the number of people using it. In this case the more users is using and contributing to the data gathering, the larger the amount of precise data will be available,

increasing the value of the platform[Var99, ch. 7]. Figure 3.2 on the previous page shows the idea of a positive feedback loop.

3.1.2.4 Platform

It is still too early in the process to make decisions about the interface for offering the venue suggestions, and a lot of possibilities is available, these will be discussed in the implementation chapter in section 4.3 on page 51.

The initial goal is to concentrate all of the data gathering around a platform(7). This makes it possible to start collecting data while keeping the initial costs down since the platform development(8) will be the only initial cost.

3.1.3 Interact with people

Interviews Since the project is still in the idea generation phase no prototypes have been created yet, but interaction with people is still crucial. Therefore a couple of interviews has been made with people from the target customer segment.

Generally the interviewees were interested in trying out new places, but usually ended up going to the same places, because of the inherent risk of trying something new that might not be as good. When they did try new places, recommendations from friends would usually be one of the main convincing factors.

The full records for each interview can be found in appendix B on page 67.

Keyword research To investigate whether people are actually using the internet to search for nightlife venues a keyword research was conducted. Google's Keyword Tool[4] was used to check a range of nightlife related keywords together location names from Copenhagen. This gave search phrases like "Bar Vesterbro". For the keywords researched, a total of 110400 searches is conducted on a monthly basis from Danish IP addresses. This shows a great interest in searching for nightlife venues online proving that a market exists, and shows that the technological readiness of the market is high enough, which is an important social factor.

[4] https://adwords.google.com/o/KeywordTool

3.1.4 Stakeholder commitments

Data providers

By providing access to their public APIs, all of the data partners described in section 3.1.2.2 on page 20 has by default provided their buy-in, by promising to deliver the required data.

Competitors

During the market analysis, seven competitors were identified, the two main ones being the Danish companies CrowdIt, who is owned by Carlsberg, and Barsektionen, both focusing on the bars in Denmark.

The fact that competitors exist means that other people believe a market exists, and the size of some of the competitors helps underline this point, so even though existing competition can make it harder to break into a market, it also means that a market exists.

A more in-depth look at the competitors can be found in appendix C on page 73.

Some strategists differentiate between a Blue and a Red Ocean strategy. In the blue ocean no market exists. This means that demand for a product must first be created before it can be captured, but it also means that there is no existing competition. In a red ocean competitors are already fighting for an existing market, and each competitor must find a way to differentiate himself to capture parts of the market. With the existing competition, this is definitely a red ocean. [Mau05]

3.1.5 Possible futures

This section has introduced the basic idea for a platform whose purpose is to collect and curate information about venues where people can go out, like bars, clubs and similar.

It would be possible to start out with the idea in it's current form, but the competitor analysis has shown that the idea in it's current state is not unique. Interacting with users though, has hinted on some ways to differentiate from the competitors in this red ocean, by providing a better value proposition.

3.1.5.1 New goals

The current goals seek to comprise all venues where people are going out. A change of goal that could move the business towards a blue ocean would be to make a more narrow focus and try to find a niche to aim for. Two possible areas of focus could be:

- Events at bars
- Niche bars

Events at bars Instead of focusing on the venues, the focus could be on events at the venues. Soccer is an example of a sport a lot of people are going out to watch, especially at bigger events like the world championship of soccer, so one way to differentiate could be to help people find the best places to watch their games.

Niche bars Another way to differentiate the idea would be to focus on a niche, like the many beer bars opening up as the craft beer market matures. There are a lot of beer enthusiasts in Denmark, and one way to focus on these people would be to keep up-to-date information about the beer selection in the beer bars, especially about which beers the different bars have on tap at any given time, a selection that for some bars can change several times in a night. This could help beer enthusiasts in their search for better beer.

3.1.5.2 New means

During the research for this section a lot of new means was made available, like further insights into the partner APIs as well as knowledge about what competitors are doing, and even more important, what they are not doing. This has revealed some possible additions to the current idea that can add unique features and a stronger value proposition.

Interacting with the target customers showed that an important factor when choosing a venue is friends, either in the form of friend recommendations, or because you are going out with those friends. The Facebook APIs contains a lot of data about people, and this data can be utilized to put a stronger emphasis on social relationships. At the same time it can provide a basis for utilizing

real-time data, instead of only basing recommendations on the historical data discussed through this iteration.

3.1.5.3 Next step

It is not possible to try out all possibilities, so the next iteration will focus on improving the value proposition by focusing more on social and real-time data, which the customers expressed specific interest in during the interviews. Even though the market is a red ocean these additional insights makes it possible to differentiate from the competition and provide a better value proposition.

3.2 Iteration 2 - Getting personal

The first iteration introduced a platform for collecting data about venues for going out, places like bars, pubs and clubs. The focus was on base data about the venues like opening hours, and which services they offered, eg. if a venue has a pool table, table football or similar.

Interacting with potential customers made it clear that the idea could be improved upon by a change in the use of the available means. This will provide some changes to the focus of the business model which can be seen in the updated canvas in figure 3.3 on the following page.

3.2.1 Means

Who I am This group of means did not change in the first iteration.

What I know The first iteration provided some further insights into crowdsourcing and network effects that will prove valuable for this iteration. Since this iteration will have a larger focus on the users, my knowledge about Search Engine Optimization (SEO) will prove to be a valuable skill in order to reach these users.

Who I know The first iteration gave a lot of additional insights into the capabilities of the partners chosen. An important aspect is the social data

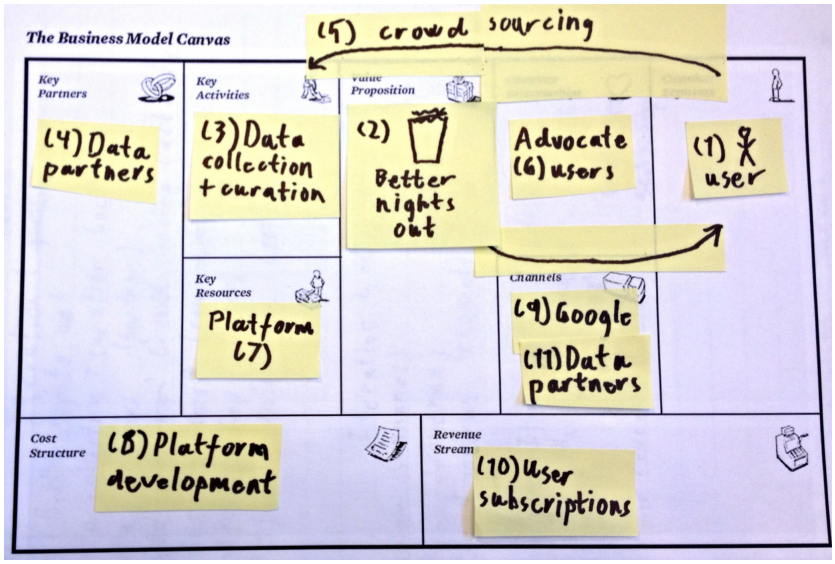

Figure 3.3: Business canvas showing the business model for the second iteration.

available, mainly through the Facebook API. This can provide an increased focus on the user(1) and the data providers(4). Both of these are directly related to the value proposition offered(2) which is strengthened as a positive side effect. New aspects has also been added to the business plan. With the inclusion of SEO as a skill Google will be considered a branding partner, thus it is now added as a marketing channel(9).

3.2.2 Goals

3.2.2.1 Providing the service

The first iteration focused on a platform for gathering and curating data. But to bring the intended value to the users a user-faced layer is required. This can be done in various ways.

Looking at the available means, a way to reach the users is to utilize "what I know". With experience in web development and development for mobile devices, and the fact that mobile phones and mobile data connections is becoming ubiquitous with data usage for mobile devices in Denmark exceeding 6.9

petabyte in 6 months[Erh12], it makes sense to make the data accessible from these devices, also because users are likely to use the service when they are out and only have these small devices available. This data usage shows that the required infrastructure is well established, which is an important political factor for the business.

For this chapter the term app will refer to the user facing solution, but whether it will be an actual dedicated mobile app or a website is an implementation specific discussion and will be a topic for discussion in section 4.3 on page 51. Since most smartphone users already use their phone for finding real-time location-based information[Int12], this is a good way to reach the users.

> "74% of [american] smartphone owners use their phone to get real-time location-based information, and 18% use a geosocial service to "check in" to certain locations or share their location with friends"[Int12]

Providing access to the data from the platform, the users can provide revenue to the business, either as a one-time payment, or on a subscription basis for recurring income(10). The app also provides a way for the user to contribute data back, this can come in different forms:

- Venue reviews
- Usage data
- Help with data curation

All of these strengthens the network effects.

Reviews Reviews makes it possible for users to share their insights and opinions with each other. Besides improving the data quality, contributing knowledge helps strengthen the users' feeling of ownership for the platform, as discussed in section 3.1.2.3 on page 23.

Usage data 18% of American smartphone users use their smartphone for geosocial services like check-ins[Int12]. Access to this data can tell a lot about the individual user, instead of only looking at the users as one homogeneous group. This makes it possible to provide mass customization, which gives a tailor-made experience to each user. This increases the perceived usefulness, the

perceived ease of use, and thus the perceived enjoyment of the app [KKS08]. Usage data can both be gathered directly and indirectly.

Direct usage data is what the user actually tells. If a user checks in at a venue, the direct data gained is that the user is at the venue right now. When a user leaves a review, it gives some direct data about the venue, like a rating, but it also means that the user has been to the venue at some point in time.

The indirect usage data is gathered by looking at the direct data at a higher abstraction level. If a user mainly checks in at venues in Nørrebro, and repeatedly leaves positive reviews at smoking places, this indirectly hints that the user prefers smoking places in Nørrebro. Looking at an even higher abstraction level it is possible to find similarities between people and places. If there is a large overlap between where two people checks in, the two are likely to share some preferences, and places where only one of them checks in could be good suggestions for the other, as shown in figure 3.4.

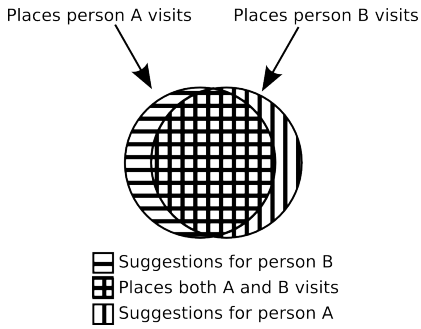

Figure 3.4: If two people visit a lot of the same places, additional places person A visit is likely good suggestions for person B to visit.

Using these insights into the indirect data can both provide suggestions for which people have similar interests, but also which venues have similar offerings. This is exactly the kind of data the recommender systems discussed in section 3.1.2.1 on page 20 requires for mass customization.

Personal curation Another way to find similarities between venues is to allow users to curate their own collections. Foursquare allows users to create lists like "Guide til København's Bodegaer"[5]. Lists can also be used for pub crawls, either user-generated, or tailor-made by the platform to people based on their common preferences. The personal curation will make people feel a greater sense of ownership of the platform.

[5] https://foursquare.com/nulstrup/list/guide-til-k%C3%B8benhavns-bodegaer

3.2.2.2 Social data

Offering an app gives a direct connection between the users and the platform, both directly, but possibly also by connecting to their existing accounts at data partners' services. This makes it possible to gather social data about the users through the same channels already in use for collecting venue data.

One of the concerns expressed by the interviewees in section 3.1.3 on page 24 was the risk of trying out new unknown places which might not be as nice as the ones they would normally visit, a concern that could be lessened by friend recommendations, which talks for the importance of social data.

Figure 3.5: Example of a user object in the Facebook Graph API. The User has a connection to a friend represented by another user object, as well as to a photo object.

Facebook Graph API Facebook user data is available through what they call the Graph API[6]. In this API Facebook creates a social graph consisting of objects and connections as shown in figure 3.5. In this graph metaphor everything is nodes, or objects as they are known in Facebook terminology; users, friendlists and pictures are all examples of types of objects. The metaphor also provides edges, called connections in Facebook terminology, which shows which objects are connected. For example a user has a connection to each of his friendlists, and to each of his photos.

The information provided by the Facebook Graph API can help show the relationship between people. Section 3.2.2.1 on page 29 about usage data, discusses how suggestions can be made by looking at similar interests between people. Knowing about the relationships between people can help make better venue suggestions, since friends usually have some things in common. If two people are friends and also likes to visit the same kind of venues, this gives even better information to use when making venue suggestions.

Another advantage of knowing about the relationship between people is that suggestions can be made based on where your friends are right now. This will be discussed further in section 3.2.2.3 on page 33.

[6] https://developers.facebook.com/docs/reference/api/

Besides the social data, the Facebook Graph API also contains some additional interesting objects.

Checkin objects provides information about where people are usually going as well as which venues are popular. As explained in section 3.2.2.2, the checkin endpoint has been deprecated, but it can still provide some interesting historical data.

A Facebook page is used to allow access to Facebook for brands, for example bands or bars. In the Graph API these pages are represented by page objects. A page for a bar will contain it's location as well as a list of people who have checked in at, or liked the bar, which is useful information when trying to figure out people's preferences. The endpoint also provides links to pictures and videos recorded at the bar which can work as social recommendations for the venue.

Some venues might set up a group instead of a page. The group object provides data similar to the page object.

Events are both related to a location as well as to the people attending, which provides more data about people's preferences.

Facebook Open Graph Besides the Graph API Facebook also has the Open Graph. This is an API used to push data into the Facebook Graph. The Open Graph operates with actions performed on objects, for example a user can "listen" to a "song", "like" an "article" or "visit" a "venue". In Facebook terminology this is called a story, and is posted to the user's Facebook timeline. Facebook allows attaching a location to a story to allow friends to see where the user is taking the action. Attaching locations to stories is the replacement for the now deprecated Graph API "checkin" object.

Posting stories to users' timelines can be used by the user as a way to tell his friends "hey guys, I'm at this place, come join". When a user posts a story from an app in this way it functions as a personal endorsement of both the app and the venue, towards the user's friend, this helps spread the word of the app which improves the network effects, because the usage of social data means that the value of the app will increase with the number of your friends using it. This turns the data partners into marketing channels(11).

3.2.2.3 Real-time data

So far the discussion in this report has focused on gathering historical data. When a user posts a review, this is stored for later use, which might be days or weeks later, but it is worth considering that when a user writes a review or makes a check-in, it means that the person is actually at the venue at that time. This can hint about how many people are at a specific venue at any given time, which can be used when making venue suggestions to other users. If a venue is well visited at a given time, and if the reviews being written are positive, there is likely a good party going on, which will be worth promoting to people looking for a place to go.

In addition to reviews, having users upload images creates even better real-time data as it will help others get an impression of the current atmosphere at the venue.

When combining the real-time data with the social data explained earlier, the app will be able to create real-time venue suggestions based on the location of the user's friends which again improves the network effects.

3.2.2.4 Google

Creating an app also makes it possible to start spreading the word about the platform. The point of this is to bring in more users and, again, increase the value of the platform for everybody using it.

Today most people searching for information, starts their search on Google who had more than 100 mio visits per months from Denmark in 2011[adim12]. This makes the Google search engine a really important marketing channel. To really get good results with this form of marketing, it is important to have good placement on the Google search result pages (SERPs), requiring the mentioned skill of search engine optimization (SEO).

Information about getting to the top of SERPs is readily available, Google even has their own Youtube channel where they publish videos helping webmasters create more user- and search engine friendly websites[7]. Some of Google's major ranking factors are:

- Often updated information

[7] http://www.youtube.com/feed/UCWf2Z1NsCGDS89VBF_awNvA

- Relevant content
- Location

Often updated information Google likes fresh and updated content, which is already a goal for the platform.

Relevant content Content should fulfill a few requirements to be considered relevant in the eyes of Google. Firstly relevant content is content that people are actually searching for. This is what the platform is trying to supply, which is why the 'interact with people' step of each iteration is so important. Another factor of relevance is what people are talking about online. This means that links to the content, and shares on social media sites are both very important when it comes to Google rankings. This point just goes to underline the importance of convincing the users to act as advocates for the platform(5), and hopefully the sense of ownership they get from helping with data curation will also make them more likely to share that data.

Location Google does it's best to try to not only read, but actually understand a user's search terms. Modern browsers both on desktops and in mobile phones makes it possible for Google to get a rough idea about where the person conducting the search is located. When Google infers that a person is looking for something location-specific, like a local business, they use this location to try to present results that are in the vicinity of the searcher.

The implementation chapter discusses further how these SEO concerns affects the actual implementation in section 4.5 on page 56.

3.2.3 Interact with people

The interviews in the first iteration showed that friend recommendations is a big factor when deciding whether to try out new venues. To see if that effect could be transferred to an app a prototype was created with a test search result screen as seen in figure 3.6 on the next page. The screen contains 5 different proposed search result each with different information to see what information would trigger a reaction from the test person.

Two of the results show basic information like name of the venue, distance and a number of reviews or friend recommendations, but the results which

included images caught the major amount of the attention. The last two results contained images of people, but the test subjects was quick to differentiate the three stock photos in result four from the Facebook profile photos of their friends in the bottommost result. The recognizable friend photos made the bottommost result the favorite choice of the testers since it was found to be most trustworthy, showing that the social input is really important.

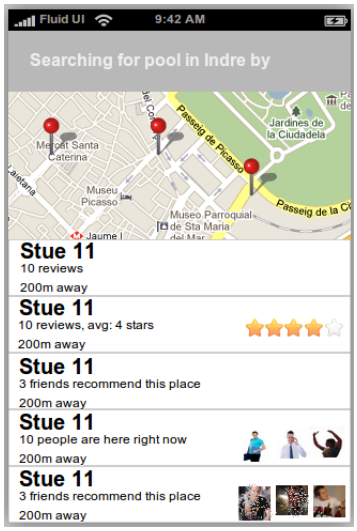

Figure 3.6: Prototype for a search result screen showing different possible result outputs to investigate what catches the user's eyes. The results with images got the most attention, but people was able to recognize the images of their friends in the bottommost result, from the stock photos in result four.

3.2.4 Stakeholder commitments

This iteration has introduced two new potential partners. Before they can be considered actual stakeholders, they must provide their consent. These two are:

- Data partners
- Advertisement partners

Data partners The partners have given their implicit consent by making all of the discussed data publicly available, they have also defined their terms for

the partnerships in their existing terms of conditions. Expecting the partners to provide all of the data necessary for the platform would be a dangerous strategy though, and this problem will be discussed in section 4.2 on page 48.

Advertisement partners Besides functioning as data providers, both Google and Facebook runs services where they push data back to their users. This means both services also benefit from getting data back from the app. Both services show the users where their data comes from, which allows them both to act as advertising platforms.

3.2.5 Possible futures

So far two main parts of the product has been defined.

- Platform for data collection and analysis.
- Frontend app for offering venue suggestions to users.

With this foundation there is a few possible ways to move on to the next iteration.

New goals At the end of the first iteration one of the possibilities for continuing development with new goals was to focus on smaller niche bars like beer bars or cocktail places. This is still highly relevant, and will only require slight changes to the app to put more emphasis on the venues' offerings instead of the venues themselves.

The other suggestion was to focus on events like concerts or sports. Like with the niche bars the development done during this second iteration has only served to improve the value that can be provided using this idea.

Both ideas can either serve as backup plans if the business needs to change direction at a later stage, or they can be integrated in the current platform in a later version when the base product has been released, but none of these will become a focus in the paper.

The venues is the main focus for the product, but so far they have not been explicitly involved. With this iteration's increased focus on gathering data about

the bar goers the concept can be expanded to provide a platform for collaboration with the venues themselves. This can both provide additional feedback on the likes and wants of the users in general, but by providing data to the venues it can also provide a possible revenue stream. Adapting the goals to include the venues will be the focus of the third iteration.

3.3 Iteration 3 - Turning it into a business

With the goal of helping people have better nights out, the first iteration outlined a platform for gathering data about local venues for going out. In the second iteration this was improved by adding an app to provide users with proper access to the collected data, and to provide users with personalized recommendations for where to go.

This iteration will look at adding a second customer segment to the business model, namely the owners and employees of the venues, from here on just described as the venues. The updated business model can be seen in the canvas in figure 3.7 on the next page

Since the iteration will be based on adapted goals, no new means is introduced.

3.3.1 Goals

After the second iteration the main revenue stream is the users of the app, but this is problematic since Smartphone users are very price sensitive. According to Gartner 90% of all apps downloaded in 2012 was free apps[Gar12], thus an alternative revenue stream is required.

To solve the revenue problem, the venues will be added as a new customer segment(12). Giving the venues access to the data collected about people's habits will help them adjust their offerings to fit the wants of their customers. This will help the venues increase their profits, thus giving them an incentive to pay for the data. This makes it possible to remove the users as a revenue stream(10), and replace them with the venues(13) by offering the venues higher revenue(14).

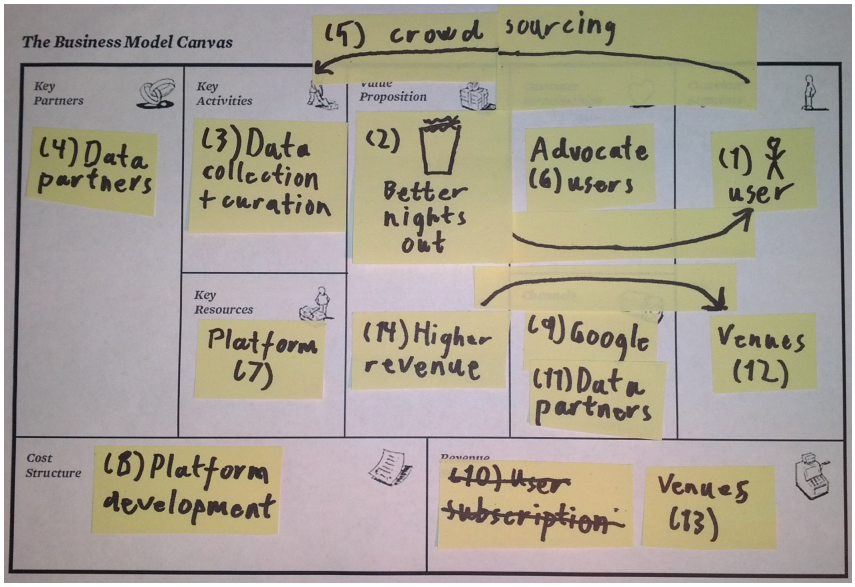

Figure 3.7: Business canvas describing the business model for the third iteration.

3.3.1.1 Multisided business

Introducing the venues as a secondary customer segments, turns the business into a multisided business, a business that provides benefits to two or more interacting customer segments, while profiting from the interaction. Multisided businesses has demand side economies of scale, this means that the more people use the app, the more valuable the service will be to the venues, this is a cross-side network effect[Eis06].

Since the value offered to the venues' side of the business grows with the number of users on the app users' side, it is important to increase the amount of app users. In multisided businesses this is usually done by offering the service at a discounted rate to the user-side. To correspond with the statistics from Gartner [Gar12] the service should be offered for free.

> "With two-sided network effects, the platform's value to any given user largely depends on the number of users on the network's other side. Value grows as the platform matches demand from both sides."[Eis06]

3.3.1.2 Free as a business model

Providing services for free is a business model that has helped many companies become successful, e.g. Google who provides a free search engine to get people to see the advertisements that is their main source of income.

Providing the app for free to the users can also create a snowball-effect where users keep attracting more users which will both benefit themselves, because of the positive feedback loops, as well as the venues, because of the cross-side network effects.[And08, how, fre].

3.3.1.3 The offering

An important question is what to actually offer the venues. Two things come to mind:

- Data access
- Push to users

Data access One possibility is to provide access to users' usage data, to offer the bars insights into people's preferences and habits. This allows the venues to adjust their offerings, if e.g. a lot of people are looking for cheap beer at 5 pm on Thursdays, this might be a good time to host a happy hour, to lure in people who will hopefully hang around after happy hour ends as well.

Push to users Another possibility is to allow venues to offer special deals. If the real-time data says that a lot of people are out in the area around a venue, but the bartender can see that his bar is rather empty, he can create a one-time offer that is pushed to users of the app based on some criteria like their location.

Having a direct connection to the customers gives the venues using the service a business advantage. This will create a network effect by making it more important for competing venues to use the service to lower that advantage. This is will mean both a network effect increasing the number of venue customers, as well as a cross-side network effect benefiting the app users because of the increasing amount of offers available.

3.3.2 Interact with people

The keyword research in appendix A on page 61 included some key phrases for cheap drinks like "billig bar København". These key phrases had more than 500 monthly searches total which shows an interest in having cheaper nights out. The competitor Drinkster who is discussed in appendix C on page 73 is in the business of selling discounted alcohol at bars in Denmark. Their iPhone app has around 8500 downloads[8] and their Android app has 1000-5000 downloads[9], none of these are exact download numbers and are not based on official data from the company, but they still hints at the app being very popular.

3.3.3 Stakeholder commitments

To prove the feasibility of selling to the venues it is important to get buy-in from some of them. At this time, the project is still only on the idea state, and a working prototype of the app with some live usage data is desirable as a proof of the idea to increase the chance of convincing the venues to buy the service. The time frame for the project does not allow for creating a production ready app, thus this is an idea for further work.

3.3.4 Possible futures

So far the project has focused on idea generation for the business model. To take the business to the next level it is time to focus on the implementation which will be the subject of the rest of the paper.

[8] http://xyo.net/iphone-app/drinkster-danmark-1EkNuVo/?country=DK
[9] https://play.google.com/store/apps/details?id=com.drinkster

Chapter 4

Implementation

The first chapter of the project introduced some basic theories for creating and improving business models. The second chapter outlined a basic idea for solving the central problem of improving people's nights out, and a business model was created. This idea and the corresponding business model was then improved upon through a set of iterations.

In this third and final chapter the defined business model is summarized and a full system is designed to fill the needs of the described business model. The overall system can be seen in figure 4.1 on the following page and includes both internal components as well as interfaces for interacting with external services and customers.

The system design defines 6 major building blocks. The details of these blocks and the interaction between them will define the major outline for this chapter, which will describe the blocks one at a time.

1. Platform - The major platform of the service, defined in the first iteration in section 3.1.2 on page 19 and extended throughout the following iterations.
2. Data providers - The major data partners for supplying venue data to the application, as defined in the first iteration in section 3.1.2.2 on page 20.

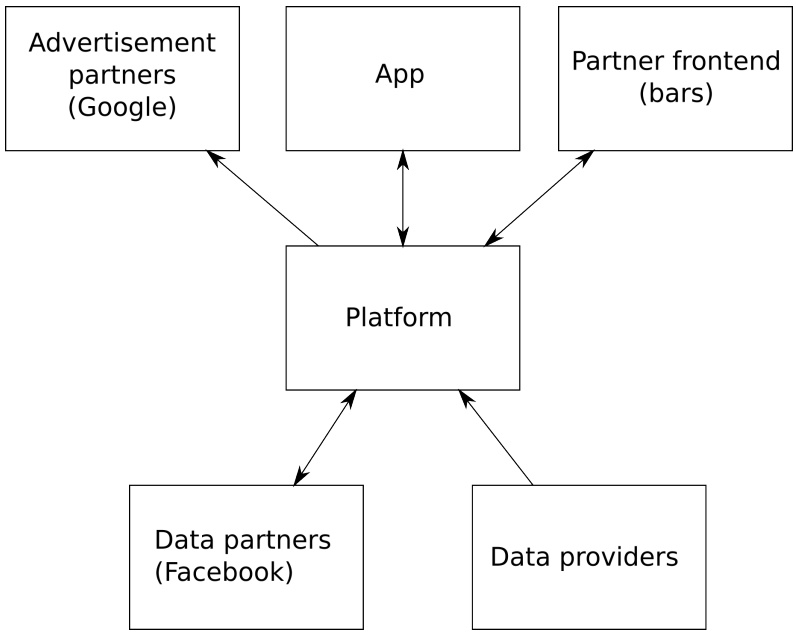

Figure 4.1: Overall view of the system design. The arrows shows the direction of the flow of data between all involved services.

3. App - The user facing app. This is the main interface for communicating directly with the users, as defined in the second iteration in section 3.2.2.1 on page 28.

4. Data partners - The major partners for social and real-time data, as defined in the second iteration in section 3.2.2.2 on page 31.

5. Google - This block describes the interaction with advertising partners, focusing on the example of Google and SEO laid out in the second iteration in section 3.2.2.4 on page 33.

6. Partner frontend - The frontend for venue customers to communicate with the platform, as defined in the third iteration in section 3.3.1 on page 37.

4.1 Platform

The platform is the central part of the system. This is the main key resource of the business, where all of the data is stored, and all the algorithms are running,

both for the recommender systems doing personalized venue recommendation, and for the data processing for the partners.

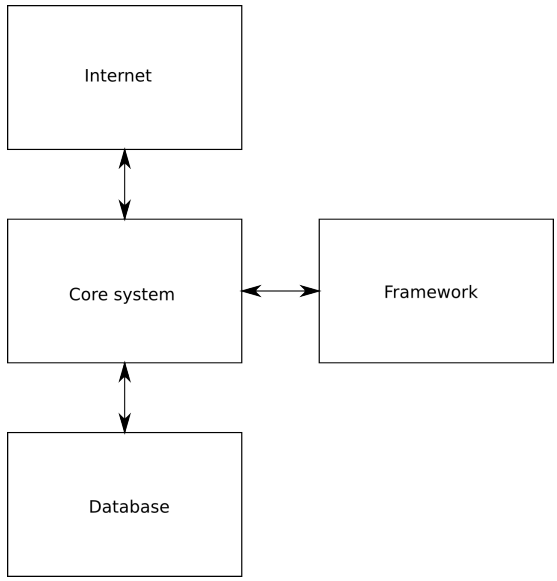

Figure 4.2: The platform consists of the core system with all the business logic. The core system is built on a framework that provides additional functionality to build web platforms to speed up production and reduce maintenance costs. The core system also communicates with the database.

4.1.1 Main components

The overall structure of the platform can be seen in figure 4.2. It consists of three major components:

- Core system
- Database
- Framework

The figure only displays the software layer of the implementation. The full system will also need a web server and various caching layers.

The important part to note in the figure, is the framework. There are three classic ways to build web-facing software:

- From scratch
- Using a framework
- Using a Content management system (CMS)

Building the software from scratch provides the highest amount of flexibility, but requires development of a lot of boilerplate code, like handling and routing HTTP requests.

A web framework is a collection of programming libraries that handles basic tasks like caching and HTTP request handling. The job of a framework is to take care of all the generic problems that most applications encounter, thus it allows the development team to focus on the unique problems their software tries to solve.

Content Management Systems (CMSs) comes in all shapes and sizes but most of them are built with a specific structure in mind. This can make them less flexible when working with very specific tasks, like the algorithms for a recommender system that should be integrated in the platform.

Using a framework saves development time since basic tasks are handled by the framework. At the same time all of the libraries in the framework are maintained by the framework developers, reducing maintenance costs for the developers. Another feature of frameworks are that they are usually used and thus tested for bugs by a lot of people, a feature that will be discussed in more depth in section 4.1.3 on page 46. This project will be built using a framework.

There are a lot of frameworks available depending on the choice of technology, a few examples include:

- Django for Python
- Laravel for PHP
- Rails for Ruby

The frameworks offers functionality to complement the technology stack they are built for, so the choice of framework should be taken based on the chosen technology, a decision which is too implementation specific to be relevant to this paper. The same goes for the choice of database.

4.1.2 Core system design

The main part of the design in figure 4.2 on page 43 is the core system. This system will be built using a Model View Controller (MVC) pattern as shown in figure 4.3.

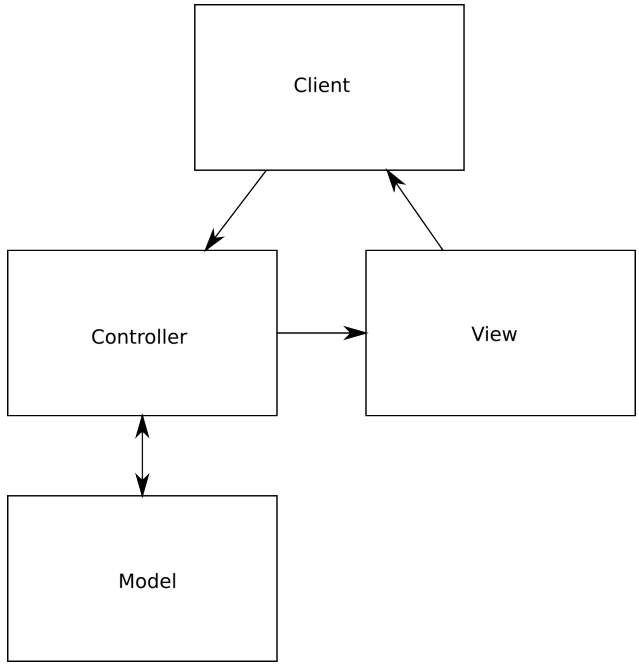

Figure 4.3: The Model View Controller (MVC) design pattern has 3 parts; the business logic and database layer found in the model, the controller which handles the user input and the view that is returned to the user.

A system based on the MVC pattern consists of three parts:

Model The model is the main business logic, this is where all required data is fetched from the application's data storage and all required data processing is done before the data is returned to the controller and put into the correct view.

View The view receives data from the controller, and takes care of putting it into the structure that will be returned to the client by the controller.

Controller The controller is the main entry point of all requests from the client. The job of the controller is to be the mediator between the client and the application. It needs to understand the request sent by the client, get the required data from the model, send the data to the view and then return the view populated with the data.

Using the MVC pattern splits the application logic into specialized segments. This provides the advantage of decoupling the views from the application logic, making it easy to structure the data in exactly the format the client requires.

As seen in figure 4.1 on page 42 the platform needs to be able to provide different interfaces to different people. The partner frontend could be an HTML-based interface for the partners to work with in a browser, while the users of the app might need a different HTML-based interface, or maybe a REST-based web service providing the data in a JSON or XML format for use in a mobile app. The MVC pattern makes it easier to provide all of these different views without changing the business logic.

4.1.3 Further choices

Very few explicit technology choices will be made in this report, but some fundamental considerations must be done in preparation for the actual product development process.

Parts of the software stack discussed so far will mainly be black boxes, since it is software provided by external vendors that the platform developers will not be changing. This is things like the database and the framework. Since the platform developers will not be working directly with the code of this software, some things that must be considered in this regard is:

Reliability The software can not be allowed to break during service, as this will make the platform inaccessible.

Vendor Lock-in Vendor lock-in describes how hard it is to change from one vendor of e.g. database software, to another vendor.

Costs All software choices have some costs. This can both be in the form of money for licenses and servers, but it can also be in the form of time for learning

about the technology and maintaining the software.

Security The platform will be storing a lot of both business critical and personal data. The data itself will be discussed further in section 4.2 on the following page, but it is crucial that this data will never be available to unauthorized instances.

Open or Closed source software When using open source software, the source code is available to the developers, whereas when using closed source, only the ready-to-use software package is made available. This distinction has an impact on some of the above considerations.

For open source software it is possible for "bad guys" to analyze the source code of the software to find flaws that can be exploited, but at the same time, it is possible for other developers to do the same. This allows more people to find and remove security problems using the concept of "two eyes see better than one". This means open source projects with a healthy community working together, like the Linux kernel and the Apache web server, is under constant scrutiny by security researchers, providing stable, well-tested and secure software. This is the same reasoning used for crowdsourcing data curation to improve data quality.

Having access to the source code of software also reduces the chance of vendor lock-in. If the vendor e.g. takes their software in a direction that users does not see as beneficial to the software project, the users can fork the project and work on their own version, like when some of the people working on the MySQL database software decided to fork the project and work on their own fork called MariaDB.

Whether to use open or closed source software must be decided on a case-by-case basis, but whenever a widely used open source alternative with a healthy community is available this will be the preferred choice for this project. This is to reduce the danger of vendor lock-in, increase security and to make it possible to change the source code to fix bugs or add business critical features, should this ever be necessary.

If components is created to solve generic problems during the project they might be released as open source projects to contribute back to the open source community, but business critical components like algorithms will not since they are considered a competitive advantage.

Costs When choosing software to build a project on, the costs is very important but it is important to be aware that costs are more than just the licensing costs, the skills of the developers are also important factors. Some tests might show that a NoSQL database like CouchDB performs better at certain tasks than a relational database like MySQL, but if the team already has experience working with MySQL and can implement a satisfactory solution in a quarter of the time it would take them to learn CouchDB, the MySQL solution will be the preferred solution. This is to keep the project moving forward, because of the reduced development costs and time.

For this project well-known technology is preferable, to keep the development moving forward and to reduce maintenance costs and the risk of downtime as it is easier to fix problems that might show up.

Development method Effectuation provided a model for improving the business model through short rapid iterations. A similar concept exists in software development, named agile development. Like effectuation, agile development focuses on short sprints, the agile name for an iteration. Agile development focuses on specific business needs, and the output of each sprint is always a predefined set of features implemented in the product. The agile development sprints fits nicely with effectuation's iterations, and the agile development's focus on finishing specific usable features makes sense with effectuation's focus on achievable goals, thus this implementation will be done using agile development methodologies.

4.2 Data providers

The system shown in figure 4.1 on page 42 contains two kinds of partners, data partners which will be explained in section 4.4 on page 52, and data providers. The major difference between the two is the direction of the data flow. The data providers are connected with a one-way data flow, inputting data into the platform without pulling anything out. The main partners in this category are the partners discussed in section 3.1.2.2 on page 20, which also mentions the actual API endpoints used from each partner. This section will delve a bit more into how the platform interacts with the APIs.

4.2.1 Getting the data

Each of the data partners provides a web service where they have their venue data available. A challenge with combining data from several unrelated services is that there is not one unique identifier that makes it possible to lookup a venue across all of the different services. One way to make this process less error prone is to connect the user's request with a data object from a partner as early as possible. This process is shown in the sequence diagram in figure 4.4.

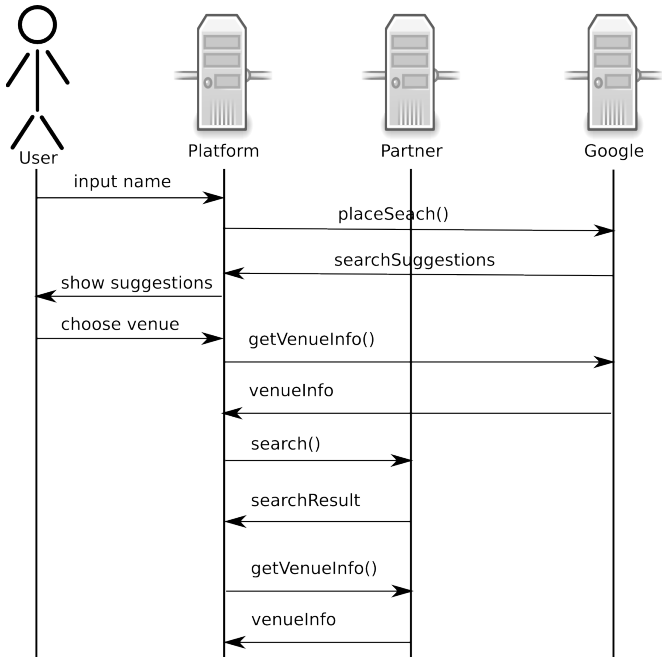

Figure 4.4: Lookup process for getting venue data from partner web services. When the platform needs to get information about a venue it makes a search request, in the search result the partner ID of the venue is found and a venue lookup is made to the service providing the ID. When venue data has been collected from one partner, additional information is available making it easier to do an automated search in other partners' databases. In this figure Google is used as an example, but it could be replaced by any data partner.

What happens is that, as the user types in the name of a venue, a search is conducted using the partner API. A search is done with the partner's search API using the user's location and the user's venue name input as parameters.

The partner returns a list of venues that are then used as suggestions to the user, e.g. as autocomplete suggestions or displayed on a map. A prototype for the autocomplete functionality can be seen in figure 4.5. An important factor to reduce the error rate, is to know the area the user is searching for a venue in, how to obtain this location will be discussed in section 4.3 on the facing page.

When a user selects a venue suggestion from the suggestions returned from the partner, a connection is made by the app to a partner venue object. This makes it possible to look up information about the venue using the partner's venue API. This will provide information like the official name of the venue, as well as a more precise coordinate set than the user would be able to supply. Using this information the venue can then be looked up at the other partners' web services for additional data collection.

As more venues get added to the database, these will also be used as suggestions to the user. If a user tries to add a venue already in the platform database, he would instead be allowed to update the existing information.

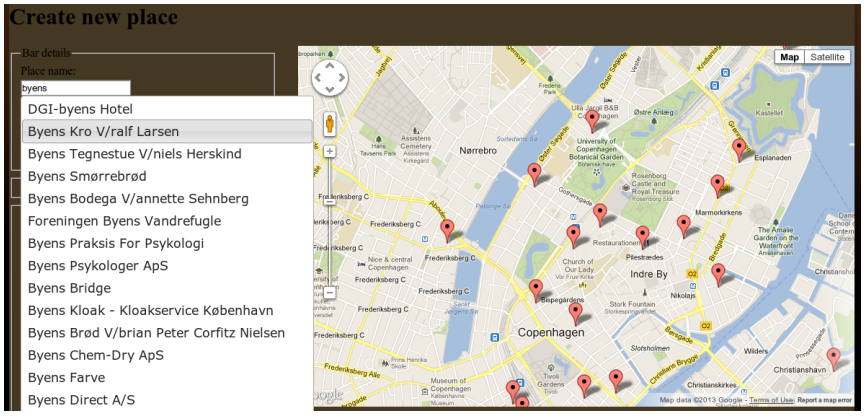

Figure 4.5: Prototype of venue search functionality. The dropdown list shows autocomplete suggestions for the name typed in the search field. The map shows the location of all of the venues in the autocomplete list. In this prototype the venues in the autocomplete list is not filtered by the type of business, rather all results Google knows about is shown.

4.2.2 Problems

Twitter is an example of a service providing an open API who has previously decided to suddenly change their terms of service resulting in a lot of companies being put out of business. This does not mean that external data sources should be avoided though, only that they should not be the only foundation for the business.

This problem is minimized by collecting data from several different web services, so if one decides to close down or change their terms of service disallowing the current use of the data, the data will still be available from other sources.

As more users come to the platform and more data starts coming in via crowd-sourcing, the data providers will continually play a less significant role, which automatically reduces the necessity of having these partners, and thus reducing the loss should they go away.

4.3 App

The app has been used as the common name for describing the user-facing part of the platform, allowing users to interact with the platform. In this section some specifics will be discussed, firstly whether the app should be in the form of a website or native apps for the various platforms

The first step for this app will be a website based on the HTML5 standard, this provides a range of benefits compared to native apps.

Basing the app om HTML5 with a responsive design makes the app cross-platform, making it possible to reach the largest amount of people with the least amount of work. It will also mean that the app will be available to both people searching from their smartphones, e.g. people who are already out and is looking for a new bar to visit, but it is also available from laptops and desktops, e.g. for people sitting at home planning a pub crawl or similar. The cost of development is kept low because of my own experience in web development mentioned in the means for the the first iteration in section 3.1.1 on page 18. This matches the principle of choosing known technology when possible, as discussed in section 4.1.3 on page 48.

Some problems regarding websites are often mentioned when comparing them to native apps, namely:

- Apps has better access to sensors in the phone (gps, accelerometer, etc)
- Apps have better response time

In this case these problems are negligible. The HTML5 Geolocation API provides access to the browser's location. On smartphones this location is provided by the GPS, so the most important sensor is available to a website as well. Regarding response time HTML5 provides a Local Storage API. This allows the app to store data locally on the device, so the website does not have to poll the server for it all the time increasing responsiveness. Some functionality, like providing venue suggestions, requires interacting with the webserver, but this is the same for both native apps and websites.

A part of the website will be implemented in client-side code, namely JavaScript, allowing the website to update the data it shows by interacting with an API at the platform. Having the API will make it easier to provide native apps at a later time, as a lot of the work for making the apps communicate with the server is already implemented. Starting with a website also makes it possible to start collecting usage stats, native apps can then be built for the various platforms based on actual user demand.

An issue when interacting directly with the users, is that the platform will be storing personal data, this makes it crucial to be aware of who has access to the data, how they access the data and the granularity of the data access. This is especially related to interacting with the venue partners, thus these issues will be discussed in the partner frontend section 4.6 on page 57.

4.4 Data partners

Data partners are a subset of data providers, the difference being that the application only pulls data from data providers, but both pulls data from, and pushes data to data partners. At this time Facebook is the only data partner, so they will be used as the example in this section.

Section 4.2.2 on the preceding page discussed some possible issues with basing the platform too tightly on data partners, this is especially true when also pushing data back to the partners. To minimize these problems the platform implements the mediator design pattern as shown in figure 4.6 on the next page. All interaction with the app will us the platform as an intermediate which handles all necessary publishing to partners. This allows the platform to store all necessary data to the database as well as publishing it to the partners.

Figure 4.6: The mediator design pattern. All interaction between the app and the partners are handled by the platform working as a mediator between all colleagues.

Facebook uses OAuth to let users allow external apps to act on their behalf, this means that when users create an account with the app they must authorize it to their existing Facebook account before the stories can be posted to their timeline.

Facebook defines a vocabulary of meta data that can be added to webpages that Facebook uses when posting to the Open Graph. Similar to Google's schema.org which will be explained in section 4.5 on page 56 the Open Graph meta data is used to tell Facebook what a page is about, in graph terms what kind of object the page is. When setting up a Facebook app it is possible to define the different kinds of objects the app is working with, as well as which actions can be taken on the objects. Facebook uses this to populate the stories posted by the app to the users' timelines.

For testing purposes a Facebook app called "LocalPub" was created, together with an action called "visit", and the object type "bar". When posting a story from the testpage at `http://localpub.dk/schemaorgexample/` this then showed up in my Facebook timeline as "Jesper Jarlskov visited a bar on LocalPub." as shown in figure 4.7 on the next page.

As the screenshot shows the story includes both the story itself, as well as which app posted it, and a link to the page containing the object. This allows users to promote what they are doing, while promoting the app.

Figure 4.8 on page 55 show the interaction happening when a user makes his first checkin. First the user must authorize with Facebook. Based on the app settings the user must give the app the required permissions. For posting stories the app only needs the "publish_content" permission. Facebook returns a secret token for the app to use. The token is reusable, thus the user only needs to do the authorization once. When the user makes a checkin, a request is sent to the app which then saves the checkin to the database. If the user has provided a Facebook token the checkin is then posted to the user's Facebook timeline as a story as shown in figure 4.7 on the next page.

If the platform is later expanded to include events at the venues as proposed in

Figure 4.7: Screenshot of Facebook story posted to my timeline from the example page at. http://localpub.dk/schemaorgexample/. The screenshot shows both a link to the page where the story was created as well as a link to the app pushing the story to Facebook.

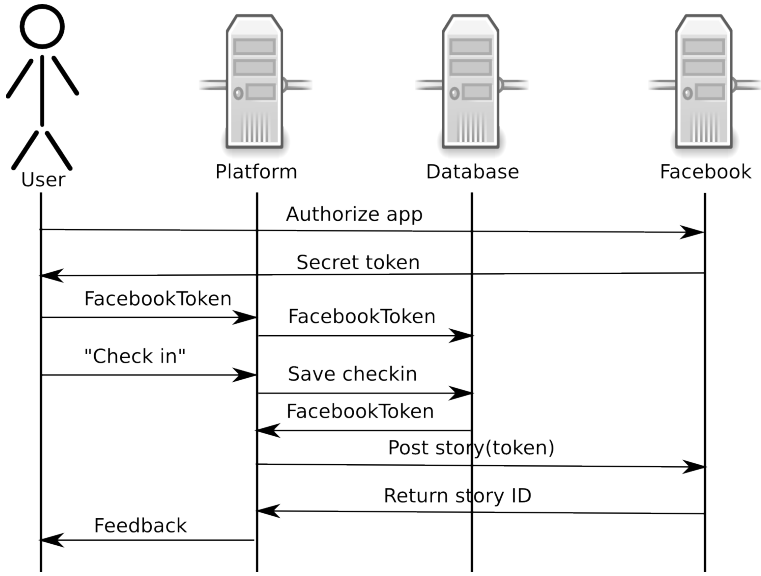

Figure 4.8: Diagram showing the sequence of events for a user's first checkin. First he must authorize with Facebook to allow the app to post on his behalf. Facebook returns a secret token for the app to identify with the user's account. Afterwards the user makes the actual checkin. A request is sent to the platform who saves the checkin to the database and then sends the actual story to Facebook.

section 3.2.5 on page 36 it would also be possible to allow people to checkin to the events, thus promoting both the ongoing event, the venue and the app to their friends.

4.5 Google

Google is different than the data partners in that the platform is not able to push data to Google. The data can be prepared in a format easily digestible by the Google web crawlers, but it is up to Google to choose if and when to gather the data, as well as how to use it.

Figure 4.9: Screenshot of the SERP when searching for "Domino's Amagerbrogade" showing how much screen real estate can be owned by a single search result using schema.org structured data.

One way to control the data Google finds, is to provide it in a machine readable format. The major search engines Google, Bing and Yahoo! has collaborated on a language for this structured data, called schema.org[1]. Schema.org provides a way to structure data to tell Google what different parts of it means. If the app has a page describing a bar, the page can be marked up as a LocalBusiness[2]. This makes it possible to tell Google the coordinates for the business for use in the location based search explained in the second iteration. It should also display the opening hours, to allow Google to tell the searcher whether or not the venue is open at the time the search is conducted. When Google has additional information available about a search result, they will sometimes spend screen

[1] http://schema.org/
[2] http://schema.org/LocalBusiness

real estate to show it, as seen in figure 4.9 on the preceding page where a search result for "Domino's Amagerbrogade" turns up both a search result with address, a map, opening hours and the scores of the reviews Google knows about. Having more prominent displays in the SERPs increases the chance of users clicking through to your site.

Figure 4.10 shows a small example search result of an example page marked up with schema.org markup. The snippet is taken from Google's rich snippets tool and Google decides on a case by case basis how much of the available data to use in their snippets. In this example they only show the venue rating in the snippet but they are experimenting a lot with various snippets like their authorship markup, which suggests that structured data is something they will emphasize more in the future. The example page can be found at http://localpub.dk/schemaorgexample/ where the markup can be seen by looking at the pages source. The full list of data Google finds in the example page can be seen in their rich snippets testing tool on http://www.google.com/webmasters/tools/richsnippets by inputting the url of the test page. The source is also included in appendix D on page 77.

Figure 4.10: Example snippet of a search result marked up with schema.org markup from Google Rich Snippets testing tool.

4.6 Partner frontend

Venue customers will need access to completely different data and features than regular app users, thus they need their own entry point for accessing the data they require. Since not all venues will have computers available for staff, the services will need to be accessible from all kinds of devices, thus the service will be available through a responsive web interface for the reasons discussed in the app implementation section 4.3 on page 51.

The third iteration introduced two possible features to offer the venues, but since there has been no interaction with the venues, it is still too early to discus the actual implementation of the partner frontend, as it should be created in cooperation with the customers to make sure it can meet their needs.

No matter how the final implementation ends up, there is a few issues to be

aware of. One thing is privacy concerns. If venues, or anyone else, gets access to the usage data of the app, they will need to be able to sort and filter the data. This should be done in a way that doesn't make it possible to relate the data to any actual persons. For people to keep using the app it is important to make sure that they know that no third party will ever have access to personal data. It is crucial to keep the users' trust in the app.

Another legal issue relates to the pushing offers to the users. If this feature is offered it is crucial that it follows countries' laws for marketing. In Denmark "markedsføringsloven" governs how marketing campaigns can be targeted. Several parts of the law applies to a service like the one suggested including, but not limited to §4 stating that an advertisement must be clearly marked as such, and §6 stating that companies must not contact individuals for marketing purposes without the person's prior consent. This means that besides creating the services in collaboration with the customers, it is also important to get the advice of a lawyer. This also goes for when writing the terms of services for the app.

Chapter 5

Conclusion

The first chapter introduced three models which has served as the basis for the business development throughout the project; effectuation, a process for decision-making utilized by entrepreneurs, Osterwalders' business model canvas, a way to visually represent business models and the SLEPT model for analyzing external factors influencing a business.

In the second chapter a business model was taken through three iterations of the effectual cycle, where it was adapted to fit experiences gained by studying the market and interacting with potential partners and customers.

The market analysis done in the second chapter was then used to create a system design for an online recommender system to solve the business' main goal, helping people have better nights out, by providing users with personalized suggestions for venues to visit based on their preferences and their social relationships.

Interacting with potential customers has shown a desire for access to a system as the one suggested and it is still the author's belief that the idea has potential for getting a part of the large amounts of money danes spend on nightlife, so the next step will be to build a prototype and start gathering experience from the platform in a working environment. The platform will be built in close cooperation with the customers.

Appendix A

Keyword research

As part of the investigation into the demand of an online platform for finding information about the nightlife a keyword research has been conducted. The goal of the research is to find out whether Danes actually go online to find information about bars and clubs.

A list of bar related keywords was made, as well as a list of areas and names of large streets in Copenhagen, the two were merged so each keyword would be used in two search phrases:

- keyword location
- location keyword

One keyword was the word bar, a location could be Vesterbro. This would give the two search phrases:

- Bar Vesterbro
- Vesterbro Bar

The full list of locations can be found in appendix A on page 64 and the full list of keywords can be found in appendix A on page 65. The keyword lists both only contain a subset of the keywords related to the business and should not be seen as exhaustive, rather as tests to prove the feasibility of the project.

All of the key phrases was run through Google's Keyword Tool on `https://adwords.google.com/o/KeywordTool` which shows the average amount of searches for key phrases.

According to Google's Keyword Tool the key phrases including a location has a total of 110400 searches from Danish clients, an average of 4745 searches for each key phrase that had been searched for. Table A.1 contains a list of all the chosen key phrases for which Google has stored data about number of searches from people in Denmark.

Key phrase	Mobile	Desktop	Total
bar nørrebro	590	1000	1590
bar nørrebrogade	480	720	1200
bar vesterbro	590	880	1470
bar vesterbrogade	480	720	1200
bar istedgade	170	260	430
bar østerbro	210	320	530
bar østerbrogade	170	320	490
bar indre by	58	110	168
bar københavn	8100	14800	22900
bar strøget	110	110	220
bar amager	170	260	430
bar amagerbrogade	110	170	280
bar frederiksberg	390	590	980
bar islands brygge	16	36	52
bar valby	91	110	201
pool bar københavn	46	58	104
bordfodbold københavn	36	110	146
sportsbar nørrebro	28	36	64
sportsbar vesterbro	12	16	28
sportsbar østerbro	22	36	58
sportsbar københavn	260	480	740
sportsbar amager	0	12	12
sportsbar frederiksberg	28	36	64
sportsbar valby	0	0	0
værtshus vesterbro	28	58	86
værtshus østerbro	22	36	58
værtshus københavn	170	260	430

værtshus frederiksberg	28	46	74
værtshus valby	5	12	17
pub vesterbro	46	91	137
pub vesterbrogade	46	91	137
pub københavn	720	1600	2320
pub frederiksberg	110	170	280
irsk pub københavn	58	170	228
engelsk pub københavn	16	46	62
dansebar vesterbrogade	22	22	44
dansebar københavn	91	73	164
diskotek københavn	1300	2400	3700
diskotek frederiksberg	16	16	32
natklub københavn	480	1000	1480
club københavn	2400	8100	10500
nightclub københavn	320	720	1040
dance københavn	880	2900	3780
disco københavn	73	140	213
billig bar københavn	110	170	280
billig øl københavn	36	91	127
billige øl københavn	22	58	80
billige drinks københavn	36	36	72
drinks nørrebro	12	22	34
drinks vesterbro	28	36	64
drinks københavn	140	210	350
drinks frederiksberg	12	12	24
billard nørrebro	0	5	5
billard vesterbro	5	5	10
billard københavn	170	320	490
billard amager	36	91	127
billard frederiksberg	12	16	28
nørrebro bar	590	1000	1590
nørrebrogade bar	480	720	1200
vesterbro bar	590	880	1470
vesterbrogade bar	480	720	1200
istedgade bar	170	260	430
istedgade club	36	73	109
københavn bar	8100	14800	22900
københavn sportsbar	260	480	740
københavn pub	720	1600	2320
københavn diskotek	1300	2400	3700
københavn natklub	480	1000	1480
københavn club	2400	8100	10500
københavn nightclub	320	720	1040
amager bar	170	260	430

amager pub	28	46	74
amager billard	36	91	127
frederiksberg bar	390	590	980
frederiksberg pub	110	170	280
Total	36277	74123	110400
Gennemsnit	4742.64	4743.64	4744.64

Figure A.1: Table showing number of searches for a range of nightlife related key phrases. First column contains the phrase, second column contains the amount of searches from desktop computers and laptops, the third line contains the number of searches from mobile devices, and the last column contains the total amount of searches.

Locations

The full list of locations searched for:

- nørrebro
- nørrebrogade
- vesterbro
- vesterbrogade
- istedgade
- østerbro
- østerbrogade
- indre by
- københavn
- strøget
- amager
- amagerbro
- amagerbrogade

- frederiksberg
- islands brygge
- valby

Keywords

The full list of keywords searched for:

- bar
- poolbar
- poolbord
- pool bar
- rygerbar
- bar ryger
- bordfodbold
- bordfodbold bar
- sportsbar
- værtshus
- pub
- irsk pub
- engelsk pub
- dansebar
- dansegulv
- ølbar
- diskotek
- natklub
- club

- nightclub
- dance
- danceclub
- dance club
- disco
- billig bar
- billig øl
- billige øl
- billige drinks
- drinks
- drinktilbud
- øltilbud
- shots
- billige shots
- billard
- billardbord
- billard bord
- billadborde
- billiard bord
- billiardbord
- billiardborde
- tilbud øl
- billigt øl
- pool bord

Appendix B

Iteration 1 Interviews

To investigate the feasibility of the ideas proposed in the first iteration in chapter 3.1 on page 18 a couple of people in the target segment has been interviewed about their general habits for choosing which bars to go to when going out.

Each interviewee was asked three general questions:

1. When you go out, do you usually go to the same few places or do you try out a lot of new venues?

2. How do you choose where to go out? Location, friend recommendations, specific features like pool table or something else?

3. How do you learn about new places to go to?

The point of the first question is to get a feel for the feasibility of the overall idea, while the purpose of the third question is to get a better insight into the user's actual behavior, and to look for new ideas to incorporate. The second questions spans over both purposes.

Andreas

Andreas is 27 and born and raised in Copenhagen

Jesper When you go out, do you usually tend to go to the same places, or do you often try out new venues?

Andreas Often the same places

Jesper And how do you usually decide on the place? Is it based on features like pool table and dies available, or is it more based on the location or where your friends are going, or something else?

Andreas Mood, previous experience, friends and prices i guess

Jesper If you were to try out a new place, where would you usually learn about it?

Andreas Friends showing me or talking about a new bar.

Rikke

Rikke is 26. She is born and raised in Copenhagen.

Jesper When you go out, do you usually go to the same few places or do you try out a lot of new venues (bars/pubs etc)?

Rikke Same few places.

Jesper Ok, so how do you choose where you want to go out each time? Is it based on features like pool table, based on the bar's location, based on where your friends are, or something else?

Rikke Preferably where my friends are, but if you can play pool as well, that's also an advantage.

The location is only important if me and my friends really want to find something close by.

Jesper If you were to try new places do you usually hear about them from the same friends, or how do you learn about new places to go?

Rikke From my friends.

Sara

Sara is 25 and born in Fredensborg. She has been living in Copenhagen since 2007.

Jesper When you go out, do you usually go to the same places a lot, or do you try out a lot of new bars/pubs etc?

Sara I usually go to the same places, unless someone I know recommends something else! I would love to try out new bars but when you don't know what they're like, it's sometimes better to got to the ones you know you will enjoy.

Jesper Ok, so how do you choose where you want to go out each time? Is it based on features like pool table, based on the bar's location, based on where your friends are, or something else?

Sara If I can have cheap beer and dance, it's a dream location.

But I guess it depends on who I go out with, if it's a group of girls, we'll go somewhere with cheap drinks and then somewhere we can dance.

And if I'm out with guys and girls, I prefer the places where we can talk, I don't really think about the pool tables, but the guys probably do. I think about the location when it's cold or rainy, then I prefer that it's near a metro or near my home, but when it's summer I don't care, I can go anywhere.

Jesper Ok, so your main concerns are price, who you are with, and the location?

Sara price, if I go out often. But I don't mind spending a little more once in a while. I'd like to try some of the cool cocktail bars, but I think it's a bit to expensive for the people that I go out with!

And yes location, if it's cold or rainy

But the most important is absolutely who I am with. I would go anywhere if the company is good!

Jesper If you mainly go to the same bars, how do you hear about new interesting places you might want to try, like the cocktail bars you mentioned?

Sara Some friends have recommended the cocktail bars.

It's actually in general my friends who recommend new places. I think I'm the one who recommends the restaurants and cafes, but not where to go out for a beer.

Sometimes I use the internetpage aok to see what they recommend.

Thomas

Thomas is 27 and comes from Svebølle near Kalundborg, but has been living in Copenhagen since 2006.

Jesper When you go out, do you usually go to the same few places or do you try out a lot of new venues?

Thomas I usually go to places that I have been to before. Sometimes, though, I try new places, this is usually places I have had recommended to me from friends.

Jesper How do you choose where to go out? Location, friend recommendations, specific features like pool table or something else?

Thomas In my circle of friends we love competing in various games, thus pool, dies, fussball and darts is rated highly. A central location is also a bonus when choosing a bar. We also has some nights where we only go for bars with good special beers. It depends on the night.

Jesper How do you learn about new places to go to?

Thomas I usually hear about new places from my friends. I rarely get any news about places etc. As far as I know there is no useful alternatives to this kind of news.

Appendix C

Competitors

An important aspect when analyzing a market is to look at the competitors. How many exists, how do they each try to differentiate and so on.

Seven competitors has been identified:

- Alt om København (AOK)
- Barsektionen
- CrowdIt
- Drinkster
- Foursquare
- Google Places
- Yelp

AOK's main focus is news about events in Copenhagen, and Google Places is basically a specialized interface for local business searches. They both cover the same segments, but their focus are different, thus they are not considered main competitors. The same goes for Drinkster which is a Groupon-inspired business

focusing on offers in bars and clubs. Drinkster are more a possible partner, than a competitor.

Figure C.1 on the facing page show a table of features offered by the different services. Based on these features the remaining competitors can be split into two groups.

- Foursquare & Yelp
- Barsektionen & CrowdIt

Foursquare and Yelp are both Silicon Valley startups working with recommendations for local businesses. They have a really broad focus trying to help everybody find anything they need, as long as it's local. They don't have the focus on bars and bar specific features as barsektionen and CrowdIt has, but try a lot more to take advantage of social recommendations. They both allow users to add new venues, review and recommend existing places and they use their data about user relationships to promote search results.

Barsektionen and CrowdIt are two Danish competitors. They both focus on bars and related venues in Denmark, and they both allow for some kind of feature search, where you can search for places with a pool table, playing dice or similar. CrowdIt is developed by Tuborg, thus it's focus seems to be narrowed down to places selling Tuborg/Carlsberg products, which limits the number of venues, but they will likely have a lot of resources available if Tuborg decides to put more focus on the product.

Table C.1: Table containing a feature overview of the four main competitors.

Service	Barsektionen	CrowdIt	Foursquare	Yelp
Add places				X
Add places				X
Available from phone	iPhone app	App only	App+web	App+web from mobile
Create your own lists		Pub crawls	X	
Drink offers	X	X	X	X
Focus	Bars / deals / caféer	Bars selling Tuborg	Everything everywhere	Everything everywhere
Friend recommendations			On venue pages only	
GPS search		X	X	X
Map search	X		X	X
Non real-time popularity			On venue pages only	
Prices				Price ranges
Real-time friend search				Timeline
Real-time offers				
Real-time opening hours				
Real-time popularity			Only really popular	
Search based on friends' history			Shows up in results	
Search for city/area	X		Badly	X
Search for features	X (Not smoking)	X		
Search for offers (happy hour)		X		
Similar to where you've been			X	
Transport	X	X	X	X
User recommendations			On venue pages only	X

Appendix D

Schema.org example markup

```
<!DOCTYPE html>
<html lang="en">
    <head prefix="og: http://ogp.me/ns# fb: http://ogp.me
        /ns/fb# place: http://ogp.me/ns/place#">
        <meta charset="utf-8"/>
        <title>Schema.org LocalBusiness example</title>
        <script src="schemaorgexample/facebook.js"></
            script>
        <script src="//ajax.googleapis.com/ajax/libs/
            jquery/1.10.0/jquery.min.js"></script>
        <meta property="fb:app_id" content
            ="574582432585960">
        <meta property="og:type" content="localpub:bar">
        <meta property="og:url" content="http://localpub.
            dk/schemaorgexample">
        <meta property="og:title" content="Byens Kro">
        <meta property="og:image" content="http://
            localpub.dk/schemaorgexample/schemaorgexample/
            byens-kro.jpg">
        <meta property="bar:location:latitude"  content
            ="55.681606">
```

```
    <meta property="bar:location:longitude" content
        ="12.579196">
</head>
<body>
    <div id="fb-root"></div>
    <div itemscope itemtype="http://schema.org/
        LocalBusiness">
        <h1 itemprop="name">Byens Kro</h1>
        <span itemprop="legalName" style="display:
            none;">Byens Kro V/ralf Larsen</span>
        <div itemprop="aggregateRating" itemscope
            itemtype="http://schema.org/
            AggregateRating">
            Rated <span itemprop="ratingValue">5.5</
                span> out of <span itemprop="
                bestRating">6</span> based on <span
                itemprop="reviewCount">2</span>
                reviews.
        </div>
        <img itemprop="logo" src="schemaorgexample/
            byens-kro-logo.jpg" style="display:none;"
            alt="Logo for the venue Byens Kro">
        <span itemprop="description">Small Danish
            bodega in the centre of Copenhagen, with a
             focus on a nice atmosphere and great beer
            .</span>
        <br>
        <img itemprop="image" src="schemaorgexample/
            byens-kro.jpg" width="600" alt="Image
            showing the interior of the pub Byens Kro,
             in Copenhagen">
        <div itemprop="address" itemscope itemtype="
            http://schema.org/PostalAddress">
            <span itemprop="streetAddress">Montergade
                8</span>
            <span itemprop="addressLocality">
                Copenhagen</span>
        </div>
        Phone: <span itemprop="telephone">33125589</
            span>
        <br>
        <h4>Opening hours</h4>
        <div itemprop="openingHoursSpecification"
            itemscope itemtype="http://schema.org/
```

```
        OpeningHoursSpecification">
        <link itemprop="dayOfWeek" href="http://
            purl.org/goodrelations/v1#Monday" />
        <link itemprop="dayOfWeek" href="http://
            purl.org/goodrelations/v1#Tuesday" />
        <link itemprop="dayOfWeek" href="http://
            purl.org/goodrelations/v1#Wednesday"
            />
        Monday-Wednesday
        <meta itemprop="opens" content
            ="14:00:00">14:00 - <meta itemprop="
            closes" content="03:00:00">03:00
    </div>
    <div itemprop="openingHoursSpecification"
        itemscope itemtype="http://schema.org/
        OpeningHoursSpecification">
        <link itemprop="dayOfWeek" href="http://
            purl.org/goodrelations/v1#Thursday" />
        <link itemprop="dayOfWeek" href="http://
            purl.org/goodrelations/v1#Friday" />
        <link itemprop="dayOfWeek" href="http://
            purl.org/goodrelations/v1#Saturday" />
        Thursday-Saturday
        <meta itemprop="opens" content
            ="14:00:00">14:00 - <meta itemprop="
            closes" content="05:00:00">05:00
    </div>
    <h3>Reviews</h3>
    <hr>
    <div itemprop="review" itemscope itemtype="
        http://schema.org/Review">
        <span itemprop="reviewBody">Really nice
            place. Friendly staff, cozy atmosphere
             and great beer at a cheap price.</
            span>
        <div itemprop="reviewRating" itemscope
            itemtype="http://schema.org/Rating">
            Rated <span itemprop="ratingValue
                ">6</span> out of <span itemprop="
                bestRating">6</span>
        </div>
    </div>
    <hr>
    <div itemprop="review" itemscope itemtype="
```

```
                http://schema.org/Review">
                <span itemprop="reviewBody">A bit smoky,
                    but well worth it if you're looking
                    for a great time out.</span>
                <div itemprop="reviewRating" itemscope
                    itemtype="http://schema.org/Rating">
                    Rated <span itemprop="ratingValue
                        ">5</span> out of <span itemprop="
                        bestRating">6</span>
                </div>
            </div>
            <hr>
            <div itemprop="geo" itemscope itemtype="http
                ://schema.org/GeoCoordinates" style="
                display:none;">
                <span itemprop="latitude">55.681606</span
                    >
                <span itemprop="longitude">12.579196</
                    span>
            </div>
            <input type="button" value="Create a story
                liking this venue. The story is only
                visible to you!" onclick="post();">
            <div id="result"></div>
        </div>
    </body>
</html>
```

Bibliography

[adim12] Foreningen af danske interaktive medier. Danskernes brug af internettet 2012. 2012.

[And08] Chris Anderson. Free! why $0.00 is the future of business. *Wired Magazine*, 2008.

[Bra08] Daren C. Brabham. Crowdsourcing as a model for problem solving. *Convergence: The International Journal of Research into New Media Technologies*, 2008.

[Cha09] Dave Chaffey. *E-business and e-commerce management*. Pearson Education Limited, Essex, England, 2009.

[Eis06] van Alstyne Eisenmann, Parker. Strategies for two-sided markets. *Harvard Business Review*, 2006.

[Erh12] Erhvervsstyrelsen. Telestatistik første halvår 2012. 2012.

[fre]

[Gar12] Inc. Gartner. Market trends: Mobile app stores, worldwide, 2012. 2012.

[Gil05] Jim Giles. Internet encyclopedias go head to head. *Nature*, 2005.

[Gro10] Lev Grossman. How computers know what we want - before we do. *Time Magazin*, 2010.

[Hor12] Horesta. Omsætning restauranterhvervet. 2012.

[how]

[How06] Jeff Howe. The rise of crowdsourcing. *Wired*, 2006.

[Int12] Pew Internet. Three-quarters of smartphone owners use location-based services. 2012.

[KKS08] Arnold Kamis, Marios Koufaris, and Tziporah Stern. Using an attribute-based decision support system for user-customized products online: an experimental investigation. *MIS Q.*, 32(1), March 2008.

[Mau05] W. Chan Kim & Renée Mauborgne. *Blue Ocean Strategy*. Boston, Massachsetts, 2005.

[Ost10] Alexander Osterwalder. *Business Model Generation*. John Wiley & Sons, Inc, Hoboken, New Jersey, 2010.

[Ric08] Francesco Ricci. *Recommender Systems handbook*. Berlin, Germany, 2008.

[Sar01] Saras D. Sarasvathy. Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 2001.

[SR11] Nick Dew Robert Wiltbank Anne-Valérie Ohlsson Stuart Read, Saras Sarasvathy. *Effectual Entrepreneurship*. Routledge, London, England, 2011.

[Var99] Carl Shapiro & Hal R. Varian. *Information Rules*. Harvard Business School Press, Boston, Massachusetts, 1999.