



Business Plan

# GreenFleet

An empty taxi is good for nobody

Bergur Ziska

Brian Haunstrup

Johannes Lund

Matias Bjørling

Simon A. F. Lund

<b>EXECUTIVE SUMMARY</b> .....	<b>3</b>
<b>MOTIVATION AND BACKGROUND FOR THE GREEN-TAXI DISPATCH PROJECT.</b> .....	<b>4</b>
<b>THE BUSINESS IDEA</b> .....	<b>5</b>
PROBLEM .....	5
BUSINESS IDEA.....	5
MARKET.....	5
BUSINESS MODEL .....	6
<b>MARKET DESCRIPTION</b> .....	<b>7</b>
THE GEOGRAPHICAL MARKETS.....	7
THE CUSTOMERS .....	7
MARKET SEGMENTATION .....	8
THE COMPETITORS.....	9
TRENDS .....	10
<b>THE PRODUCT</b> .....	<b>12</b>
UNIQUENESS .....	13
IPR .....	13
PRICE, PERFORMANCE AND PRODUCT DEPENDABILITY.....	13
<b>NEED FOR APPROVALS</b> .....	<b>14</b>
<b>MANAGEMENT</b> .....	<b>15</b>
BRIAN HAUNSTRUP.....	16
JOHANNES LUND.....	17
MATIAS BJØRLING .....	18
SIMON LUND.....	19
BERGUR ZISKA .....	20
<b>BARRIERS AND RISKS</b> .....	<b>21</b>
<b>FINANCIALS</b> .....	<b>24</b>
INVESTMENT ANALYSIS .....	24
BUDGET .....	24
CONTINGENCY PLAN - FIRST CUSTOMER RELUCTANT TO PAY UPFRONT.....	28
<b>CONCLUSION</b> .....	<b>29</b>
<b>APPENDIX</b> .....	<b>30</b>
FEEDBACK FROM MAIL SURVEY.....	30
TELEPHONE INTERVIEWS.....	35
<b>SPREADSHEETS</b> .....	<b>42</b>
CASH FLOW .....	43
SALARIES .....	44
<b>MARKET</b> .....	<b>45</b>
PRODUCT UNIT COSTS .....	46

## Executive Summary

### Value Creation

A typical taxi fleet has an overall non-profit driving about 50 %. The Green Taxi Dispatch System is aiming to reduce the non-profit driving of a taxi fleet by making better forecasting of where the taxis should be located in a given timeframe. This way they will be able to pick up customers without striving to far away from their original position. There are several value creations in this business idea. The overall reduced fuel emissions (CO2) is without a doubt beneficial for the local environment thus providing the taxi distribution companies with a more green environmental profile. Furthermore the taxi owners will save on fuel- and maintenance costs.

### Customer

The interesting segments are the medium sized business with the need for our system; they rely on other suppliers for their solutions and can freely switch systems. The more lucrative big business dispatchers have many taxicabs and a **die-hard** need for systems for dispatching and fleet management.

The benefit gained with our solution is proportional to the size of the fleet. But because our expenses also are proportional to the size we initially go for medium sized taxi dispatch services and later large dispatch services.

### Why Buy?

The solution provides the taxi dispatch services with a more green environmental profile which they could use to attract large customers, in example local municipalities, large hotel chains, and big companies who want to make a difference. Furthermore the savings on both fuel and maintenance costs will also benefit the taxicab owners and attract more taxicab drivers and owners to their fleet.

### Team

While our team is rather inexperienced in general business terms we do hold a strong technical insight in software development and geographical information systems. As the business growth more mature it will be beneficial to add some key people in other areas such as sales and marketing.

### Start-up capital

We will be in need for some initial investments either from one or more investors or in form of up-front payment from potential customers. In the first phase we will need approx. 500.000 DKK in establishing a decent office environment and to finance the prototyping the software development. Secondly we need approx. 2M DKK to develop the final product and the hardware for the initial sale.

## Motivation and background for the Green-Taxi dispatch project.

The idea of creating a dispatch system emerged as a natural consequence of the group composition. The group consists of four computer scientist students and a geography student. So the area of integrating data with position was obvious. All participants in the group found the subject interesting and were confident that this would have areas where we as a team could bring new ideas to the table.

Several areas where the usage of GPS could be used for optimization and/or visual presentation, was discussed in the group. Among these was a 3D map where information would be visible in the z-axis, exercise-gadget that would keep track of the training route, dynamic navigation units for vehicles with the opportunity to use GPS information from these in analyses of road conditions, average speed, congestions. A system to help consultants and salespeople with tracking their whereabouts and bundling this with time scheduling, was also on the table. The list was shortened but it gives a good impression on the direction of the group. Working with GPS and eventually some kind of optimization problem was in the interest of the group.

We chose to investigate if there would be a business opportunity in the taxi industry, since the problems associated with optimization, forecasting and analysis caught the interest of our group. In the initial stage of the idea, we had low expectations towards the level of technology used in the taxi business.

We must admit we had low expectations regarding the software and equipment in use. In this assumption we were wrong. Larger dispatch services use complex solutions in order to use a minimum of human resource to manage the taxi dispatch fleet of vehicles. What we thought to have been a good and perhaps new and unique way of dispatching taxis, turned out to be a competitive market with around 10 companies delivering complete solutions to the taxis in Denmark. These systems provide a wide range of tools to manage the daily dispatching.

One of the areas where we saw there could be business opportunity was in taking an environmental and optimization approach to fleet management. It came to our knowledge that around 50% of the distance traveled by a taxi is without customers. Also we noted that the drivers tend to drive non-economical and environmentally irresponsible. There was an interest from a taxi dispatch service in being able to brand them self as being environmental aware.

By offering new tools to optimize the ordering-process and analysis of driving patterns, these latter products would differentiate our company from the rest, and prevent the taxi-companies from changing to other dispatch systems. The idea in the group was to enter the market in Denmark and use this relative small market at a testing ground and later expand to countries in the northern Europe.

## The Business idea

This initial chapter aims to give a brief introduction to the general business idea. Please refer to later chapters for more specific detail.

### Problem

**Insufficient taxi-distribution results in high share of non-profit fares.**

In our research we found out that almost 50 % of the overall taxi-driving is non-profit, either driving to collect specific customers or simply driving and "fishing" for random customers.

An empty taxi is good for nobody. So there is much value in re-distributing and positioning the taxi fleet to address this problem. Furthermore we have identified some problems with the way a fare is being calculated, forcing the taxi driver to drive in a non-economical way - both for business and environment.

### Business idea

**Software-based solution for fleet distribution which aims to reduce the share of non-profit fares.**

The business idea is generally to reduce the non-profit driving, by optimizing the distribution of taxis. We aim to reduce the non-profit driving by making better forecasting of where the taxis should be located in a given timeframe. This way they will be able to pick up customers without striving to far away from their original position.

There are several winners in this business idea. The overall reduced fuel emissions (CO<sub>2</sub>) is without a doubt beneficial for the local environment thus providing the taxi distribution companies with a more green environmental profile - which could attract large customers, in example local municipalities, large hotel chains, and big companies. Furthermore the savings on both fuel end maintenance costs will do the business good.

### Market

**The market for Taxi Dispatch Systems is somewhat saturated but none the less there is a market.**

The great amount of competitors surely indicates that there are pain to be addressed and therefore a market to exploit. Almost every dispatch service is using some kind of GPS-based dispatch system and the software and hardware is most commonly bundled together. This makes it somewhat more difficult only to produce a software-based solution while it may not be compatible with the hardware provided, more on this in the business model. To gain a profitable business we need several big Taxi Distribution Companies in larger metropolitan areas. In Denmark we would be targeting Copenhagen, Aarhus, Odense and Aalborg, In

Sweden Malmö, Göteborg, Stockholm. The big market however could be Germany which holds a broad distribution of big cities.

The big player in northern Europe is Finn Frogne A/S holding approx. 50 % of the market in Denmark.

## **Business model**

### **Production of Complete Taxi Dispatch Systems to the international market**

Our initial analyses indicate that we cannot break into market with this software-application alone, while every dispatch system is bundled together in complete solutions. Therefore we will also do complete solutions. We will buy hardware units (monitor, terminal, GPS etc.) from subcontractors and install our unique software and sell it as a complete solution.

Our hardware production costs will be around 10-12.000 DKK for every installation. Furthermore we have to install a central administration server and link the server and client together.

The selling price will be approx. 75.000 DDK per taxicab and the profit will mainly come from the software development, which is our unique selling point. The solution will be based on a green (environmental) profile and this will also be pivotal in the marketing strategy later on in the process. **We will be competing on value, not price.**

## Market description

### The geographical markets

We will initially focus on the Danish market and the geographical distribution of customers in Denmark.

### The customers

A brief introduction to the taxi business is needed in order to understand who our customers are.

The taxi business is ordered in a three-layered hierarchy of decisive power (as figure 1 tries to illustrate), at the top-level the municipal institutions regulate the behavior and distribution of taxicab drivers.

This is due to the fact that taxicabs are part of the public transportation system in Denmark.

Understanding the municipal institutions power and effect on the taxi business requires a couple of examples of what they regulate.

Taxicab drivers may only take fares via:

- The taxi dispatch service assigns a pickup location for a specific customer.
- Hold in line by a taxicab stand.
- Customers hailing driving taxis.

The municipal institutions regulate the use of taximeters and the geographical placement of taxicab stands and the amount of taxis allowed within their area. They are also the only authority that grants taxicab driver licenses.

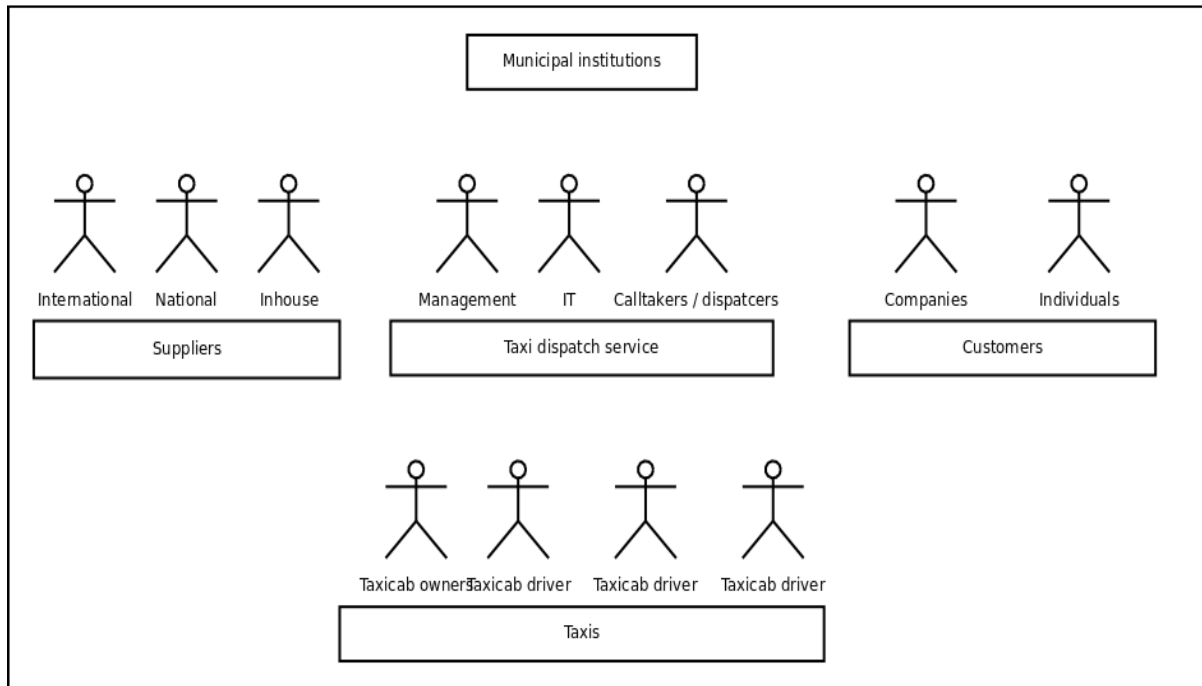


Figure 1

The middle layer consists of the taxi dispatch service and its employees. There are multiple taxi dispatch services in Denmark, more on the actual numbers later. The exact organization of the dispatch services is not regulated. The dispatch service organization is closely related to their size where size is measured in the amount of associated taxicabs.

The lowest layer consists of the actual taxicab drivers, taxis and taxicab owners. The taxicab owners can also be taxicab drivers.

A taxicab driver can choose to be a taxicab owner or only be a driver for another taxicab owner under a dispatch service.

- A taxicab driver needs a license to drive.
- A taxicab owner must register his or her taxicabs with a dispatch service.

The taxicab registration costs and binding period varies from one dispatch service to another. Pricing is set about 700-1000 Danish kroner for one week. When a taxicab is associated with a dispatch service some other expenditures must be taken into account. The dispatch services usually install hardware specific to their dispatch solution in the car and brand the car with stickers from the dispatch service, this process costs the dispatch service about 75.000 DKK per taxicab for hardware and software. The taxicab owner pays a smaller amount for the actual equipment installation in his or her taxicab. In principle the taxicab owner can switch from one dispatch service to the other with only one weeks notice. But in practice the barrier is a little higher due to equipment installation. A switch also costs the taxicab owner lost revenue due to his or her taxicabs are in the garage getting equipment installed instead of being out on the street taking fares.

The dispatch services income is based on the amount of associated taxicabs. This means that they base their business on volume. The dispatch services are therefore in tight competition with each other to attract taxicab drivers and taxicab owners.

The dynamics are different in other countries because of a variation in legislation which is why we have focused on how to enter the Danish market. In Sweden the taxi business is free and unregulated, this means that the dispatch services in Sweden does not have the responsibility to provide coverage and ability to supply taxis. Thus the need for dispatch services in Sweden is not as severe.

The structure of the Danish taxi business introduces market dynamics that pinpoint our customer and jury. We want to bring a product to the market that minimizes the time and resources wasted when not driving with a customer and driving towards a pickup location. Both dispatch services and taxicab owners are interested in this optimization since it maximizes the contribution margin for the taxicab owners by minimizing expenses. This motivates the dispatch services; if they can provide these advantages they can attract more taxicab owners and increase their income.

## Market segmentation

"Dansk Taxa råd" the authority that grants taxicab driver licenses states that 96% of all taxicab dispatch services are members of their union. The Danish market consists of 56 taxi dispatch services registered with "Dansk Taxa råd".

Details on the Danish market can be found in appendix dispatchservices.xls. The essential numbers are 56 taxi dispatch services with a total of 4167 taxicabs on average this is 75 taxicabs per dispatch service. This number however has a very uneven distribution.

The smallest dispatch service has 7 taxicabs and the biggest has 798 registered taxicabs.



The Danish market can be segmented into small, medium and big dispatchers.

Segment	Range	Dispatch services	Taxicabs	Average
Small	0-40	39	868	22
Medium	40-100	9	382	42
Big	100+	8	2940	368

Figure 2

Some of the big dispatch services have in-house development of their software solutions, others buy them from Danish suppliers and others from international suppliers. We will get back to this when we describe our competitors.

The medium sized dispatchers has a need for more advanced management software with dispatching and fleet management, they buy these software solutions from the big dispatch services or from the established Danish suppliers.

The small dispatchers does not have as much need for high-tech fleet management and dispatch some can management their dispatch by regular phone calls to taxicab drivers.

The interesting segments are the medium sized business with the need for our system; they rely on other suppliers for their solutions and can freely switch systems.

The lucrative big business dispatchers have many taxicabs and a die-hard need for systems for dispatching and fleet management. Some of them however develop their own systems and can be very hard to replace since they act as both potential customer and supplier to the market.

The dispatch services software solutions are long-lived according to our interviews.

The base decision maker for our product is management inside the dispatch service, the taxicab drivers and owners however are also a die-hard indirect jury. If a dispatch service does not cater for their needs then they lose them to competing dispatch services.

It is therefore essential that our product is beneficial to the taxicab owners so the dispatch services can use it to increase their attractiveness compared to their competing dispatch service.

## The competitors

Our knowledge of our competitors is based on interviews with **as many the dispatch services in Denmark as we could get a hold of**, we got contact information from "Dansk Taxi Raad" and initially asked them six simple questions.

- Are there areas were you image that utilizing GPS information would improve your dispatch service?
- Do you already use GPS information?
- Which dispatch software solution do you use today?
- What kind of problems have you experienced with your existing systems?
- If you were to choose one thing to improve in your system, what would it be?

- What do you do when your systems crashes?

We also did a personal interview with a much more detailed set of questions. The questions and results hereof are available in the appendix. To summarize then the results of this was that our biggest national competitor is Finn Frogne AS. Finn Frogne AS supplies all-in solutions for dispatch services and currently has a hold on 50% of the Danish market. The rest of the dispatch services use systems from international suppliers or in-house development.

The in-house development strategy takes a large part of the small and medium sized dispatch services; an example of this is Randers Taxi. Randers Taxi only has about 70 taxicabs in their on dispatch service but their dispatch service solution caters for about 200 additional taxicabs. According to our interview with their CEO then they are developing a closed source and non interoperability minded solution. They simply aren't interested in product integration with other suppliers. This gives the in-house developers strong supplier power.

The biggest international supplier is "Digital Dispatch (DDS)", their strongest selling point is that they sell the most feature rich solution and of course bundles it with the necessary hardware. Running their solution however has high startup costs for the dispatch service and requires that the dispatch service has manpower to administrate the DDS solution. The DDS solution poses a great threat of substitution since it currently features eight different algorithms for dispatching taxis, DDS could simply implement a ninth algorithm with the same goals us.

The general case is that the dispatch services use all-in solutions from a single solution supplier whether they create the solution themselves or buy them from others. The all-in ensures a tight grip from the suppliers, the dispatch services cannot utilize hardware from different vendors or opt-in third party software into there solutions because the suppliers restrict this.

In practice this means that we cannot simply produce a piece of software that interoperates with the rest of their dispatch solution we must also deliver an all-in solution of both hardware and software.

The state of the market shows a high saturation for all segments, the small and medium sized dispatch services buy solutions from the medium sized dispatch services in-house development departments, the big dispatch services buy from the international supplier. This can prove to be a difficult market to enter but it does reduce the threat of new entry.

## Trends

As the previous section describes then the municipal institutions has severe impact on the taxicab business. Recent trends show an increased interest in green technology the recent legislations trends in Denmark are:

- 70 percent fees for taxicab prices above 230.000 Danish kroner.
- Taxicabs must be of energy class C.
- Taxicabs with diesel engines must have a particle filter installed.

These trends prove and actual interest in improving the utilization in the taxicab business.

Another initiative from the municipal is a change in the algorithms in the taximeter. The taximeter defines how much money a taxi driver earns based on the nature of his driving. The algorithms change from the current "brud-punkts takst" to "parallel" without to many technical details this means that the taxi drivers will be rewarded for driving economically were the current model rewards quick acceleration.

These legislation initiatives does however not improve any of the wasted resources spend driving around. This is where our product steps in.

Recent trends in general are shown in utilizing the GPS technology; COWI is doing traffic analysis together with the Danish freight company 3x34 to analyze traffic patterns they aren't optimizing 3x34 driving patterns but selling analyses based of the movement.

## The Product

Today's technology provides several possibilities in terms of vehicle management primarily due to the Global Positioning System (GPS). The question is how many of the possibilities that can be derived from this technology are already being exploited.

One of the possibilities is the taxi business where GPS based vehicle management would be obvious. Today's taxies already have GPS devices installed at it is already used for vehicle management.

By putting an effort into reducing resource consumption we can label our product with what we call a *Green Profile*<sup>1</sup>, signaling that by acquisition of this product the customer is willing to do their part for a better environment. This is our focus and where we excel from existing competitors and gain increased market share.

The rationale is that fewer resources are consumed the less the expenses per vehicle operator that lead to the client being able to grow in size by gaining favor of existing taxi driver not attached to the company.

The product as a whole is a complete fleet management package. The required technology and protocols are well known and has to be included in order to provide an attractive product.

The idea is to implement a software solution that is located on a central server. The server stores GPS data collected from taxies. The data must be delivered at a high frequency to facilitate the possibility of performing forecasting. Besides the positions the system will be able to incorporate environmental information ranging from time of year, traffic information and events taking place nearby. The information gathered and processed will result in directory assistance for the people responsible for the vehicle management. Everything from points of interests that needs to be considered and colored maps to display what regions should be prioritized. Further information would be when a taxi moves from one region<sup>2</sup> to another. The classification of the regions will also be weighted by the number of taxies. Selected information produced by the system can be sent live to the taxi driver allowing the driver to be kept update with today's strategy and also to improve salary.

### Specification

- Terminal hardware for the vehicle for interaction (per vehicle).
- GPS device (per vehicle).
- Credit card payment system.
- Wireless transmission unit (per vehicle)
- Client software.
- Wireless receiver unit.
- Server software.

---

1 We refer to a Green Profile as a term for making our way of making a more environment friendly solution.

2 A region is a subdivision of a city used to efficiently communicate distribution and positioning of the taxies.

## Uniqueness

The Green Profile which leads to less resource consumption. This will be achieved by applying state of the art geometric algorithms. We will excel in this area by having the first version lowering the resource consumption by at least 10%. This is to bring more focus to the environmental consciousness which in itself is a strong label on any brand.

The taxi drivers receive live information as to how they are complying with company determined policy. Thereby they can earn a score indicating how they follow the general philosophy of less CO2 the better.

## IPR

We have a limited range of DK/EPO<sup>3</sup> patents that we need to incorporate in our product.

There is a range of patents that will be used in this system however only a handful that we will incorporate in the product we develop since most patents are already in the hardware that we resell.

The patents can be broken into five subgroups: GPS, Terminal (The interactive device in the vehicle), Credit card payment system, send receive devices for communication and finally the algorithms we use in the software we develop.

Following the patent search is provided by Google patent database.

Some patents used in the hardware devices:

- 6628232: GPS Tracker by Mark W. Hynes, Barry C. Miller, Mark S. Barrett. Filing.
- 5905461: Global positioning satellite tracking device by Timothy J Neher.Satellite-based.
- 4359733: Vehicle position determining system by Gerard K. O'Neill.
- 7124936: Point of sale payment terminal by Randy J. Templeton et al.

Some patents that may be used in the developed software:

- 5461699: Forecasting using a neural network and a statistical forecast by Mansur Arbabi et al.

These patents however are US classifications and are not applicable in Denmark/Europe. This has been verified via the patent search database in "Patent- og Varemærkestyrelse" (hence referenced PV in this document). A corresponding patent exists to the credit card payment system referenced: "Ansøgningsnr. PA 2001 00586" in the PV search database. As for the terminal we may have to make use of a patent owned by our strongest competitor Finn Frogne A/S for terminal installation. This patent is referenced: "Ansøgningsnr. PA 2004 00622" in PV database.

## Price, Performance and product dependability

The price per unit is ranges from 9600-11.200 DKK per taxicab including installation. The sales price for the dispatch service is 75.000 DKK per taxicab, server software is included in this price since expected average sales will be 50 units or greater. Further details can be inspected in appendix on **Unit Costs**.

---

<sup>3</sup> Danish Patents Office (Patent- og Varemærkestyrelsen) and the European Patent Office.

The first goal is to deliver a system that performs equal or better than existing solutions.

The product depends on chosen wireless/mobile data transfer providers. Today's existing hardware is very reliable; however for sake of argument our product reliability is also dependant on the hardware.

## **Need for approvals**

In order to enter the market it is necessary to comply with the security and general legislation by using certified hardware: computer, touch Screen monitor, taximeter display, GPS Tracker and credit card system. The software itself does not require any verification since it is legal to produce. However we will likely need to document thoroughly that the software complies with all the security standards regarding handling sensitive information.

Finally since we operate on GPS based data we have to make sure that we do not violate the national legislation on surveillance.

## Management

The management team holds students in computer science and geography/geoinformatics. Although four of the team members are currently studying the former, they each bring a different level of experience, competences and team roles to the project.

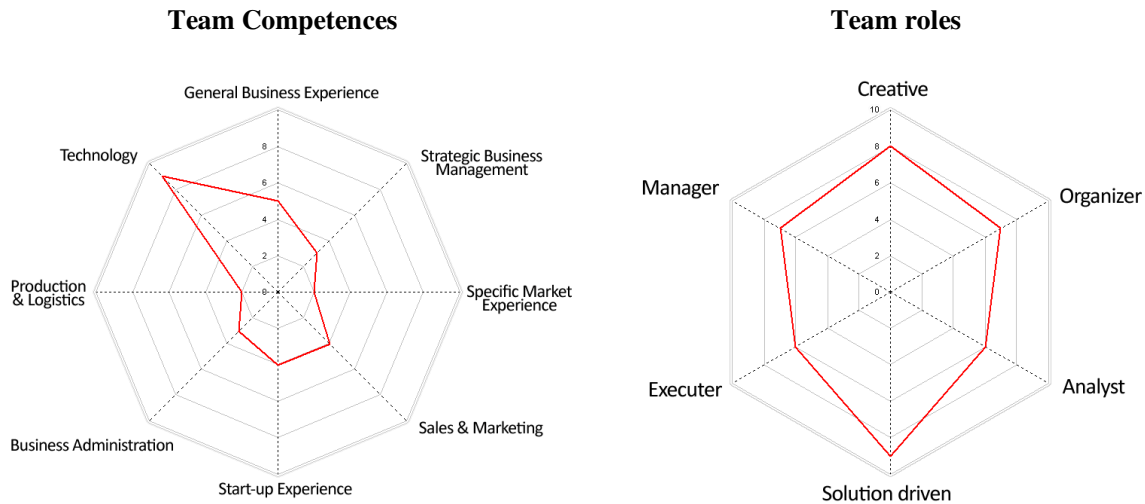


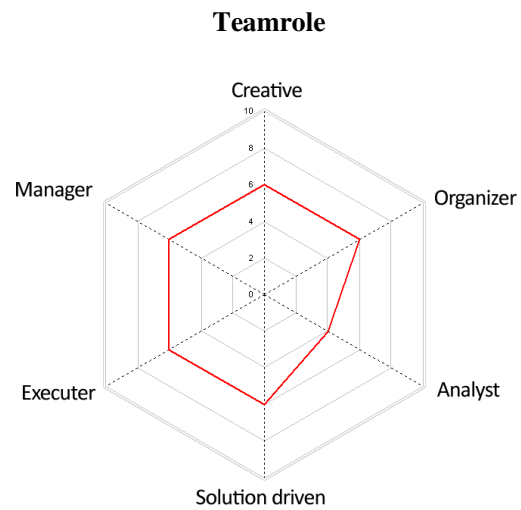
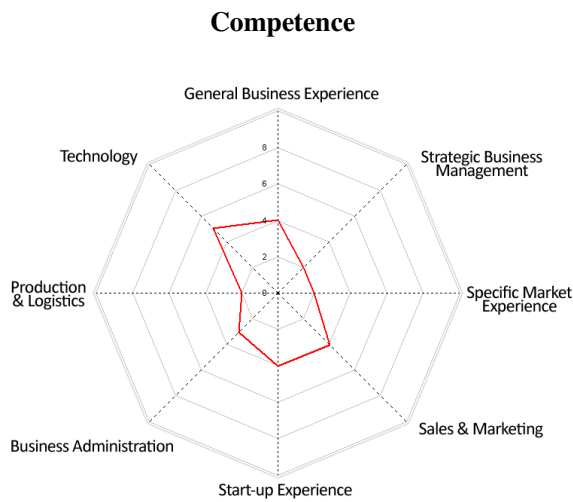
Figure 3: Team competences and team roles

In figure 3 it is obvious that the main strength in the team is technology. That means we will be able to embrace the technical functionality and complexity to process this kind of product. Furthermore it is an indication of the knowledge we hold regarding to existing technology and possibilities in near future. Although we hold some general business experience we clearly need key people in many other areas. Specific Market Experience and Startup Experience is both areas where "learning by doing" - and this could take years - is the only way, whereas Strategic Business Management, Business Administration, Sales and Marketing, and Production & Logistics is learned by students at multiple universities and could relatively easy be included in the overall management.

We also need to look at the distribution in team roles. The roles differ from competences as it says more about mentality than skills. As with technology we are first and foremost a creative and solution-based team. We need to strengthen the areas of management and organization, either by changing focus or bring in people with this kind of mentality. Also we clearly need people to help with analysis and executing - mainly regarding to sales and marketing.

In the following we will briefly present each of the team members.

## Brian Haunstrup



### Personal data

Born: 22.05.1976, Herning

Currently residing: Nørrebro, Copenhagen

### Education

- Multimedia Designer, Academy of Business, Aarhus (2001)
- Bs.Science in Geography & Geoinformatics, University of Copenhagen (2008)  
Currently writing a master thesis in the use of GIS-based consumer services

### Main experience

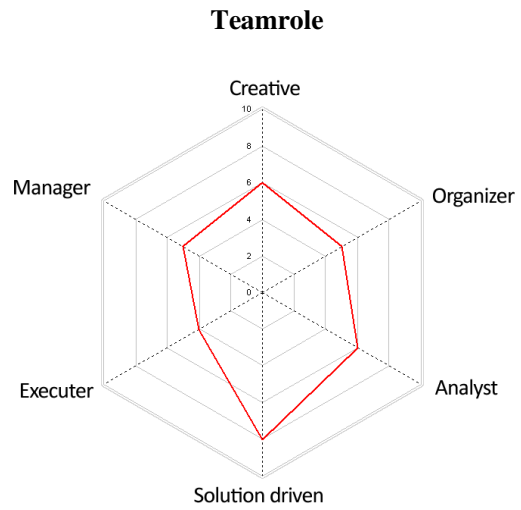
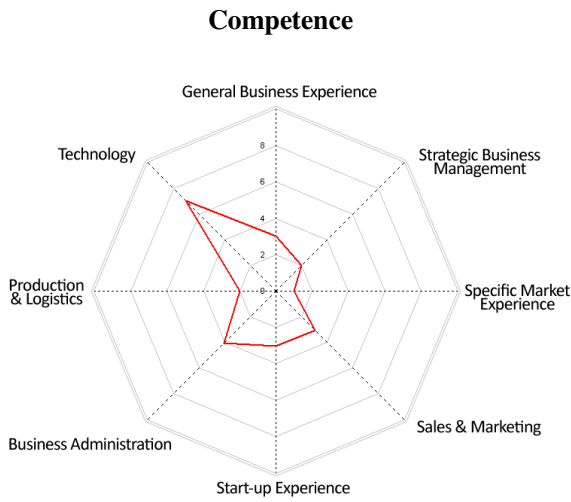
- Designit A/S (2002-2005)  
3 years as webdesigner/project manager
- Klikbart (2008-)  
Personally owned webdesign business

### Area of interest

Business development, graphic design and usability, Geographical Informations Systems (GIS)



# Johannes Lund



## Personal data

Born: 27.04.1982, Roskilde

Currently residing: Nørrebro, Copenhagen

## Education

- Bs.Scient in Computer Science, University of Copenhagen (2009)

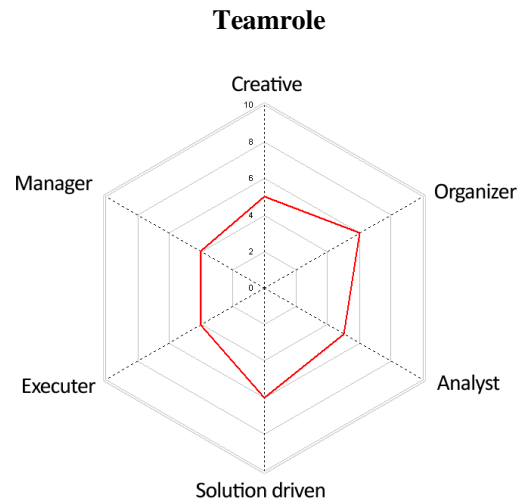
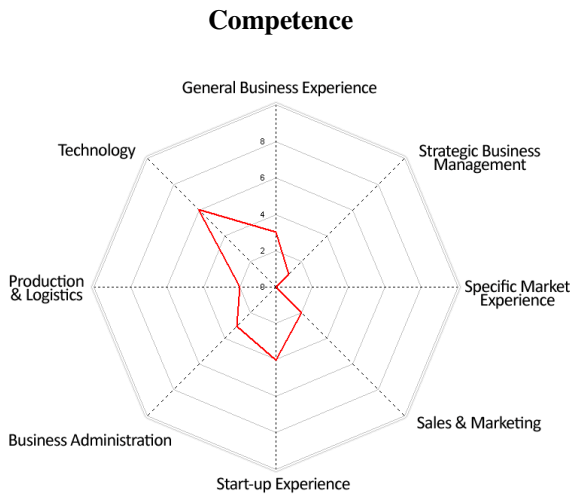
## Main experience

- JL-IT development  
Personally owned consultant company within the area of computer science.
- Insite ApS  
Development and maintenance of web crawling technology. Software development for internal use.

## Area of interest

Management, software development and system architecture

## Matias Bjørling



### Personal data

Born: 04.05.1984, Næstved

Currently residing: Amager, Copenhagen

### Education

- Stud.Bs.Scient in Computer Science, University of Copenhagen (2009)

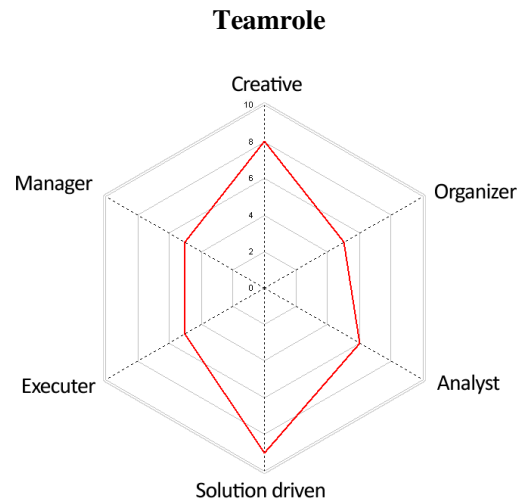
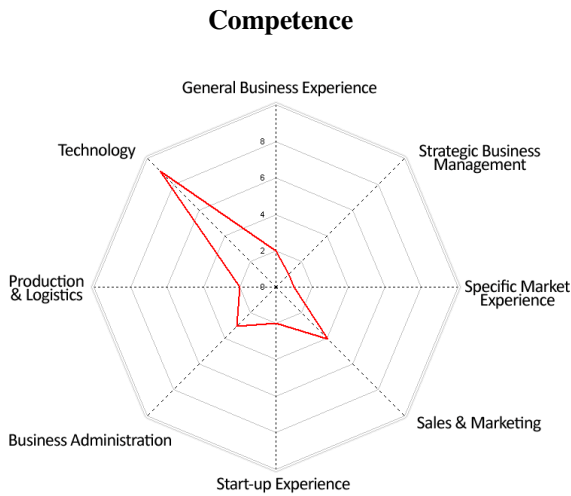
### Experience

- Developer at Emun (October 2004 -)  
Working as software consultant in own company
- Developer at T-Systems Nordic (2007 - 2008)  
Part-time developer for customer oriented projects
- Technical Support at Theilgaard Mortensen (2005 - 2007);  
Development, database management and migration of public dentist software system databases

### Area of interest

Software development, database systems and tuning

## Simon Lund



### Personal data

Born: 24.10.1983, Hvidovre

Currently residing: Nørrebro, Copenhagen

### Education

- Stud.Bs.Scient in Computer Science, University of Copenhagen  
Currently writing a bachelor thesis in distributed systems on GRID computing.

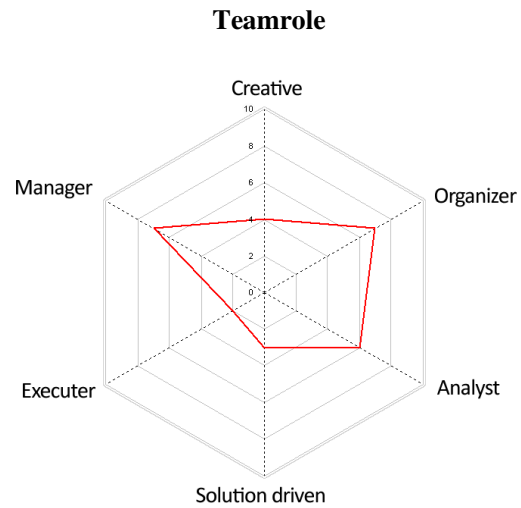
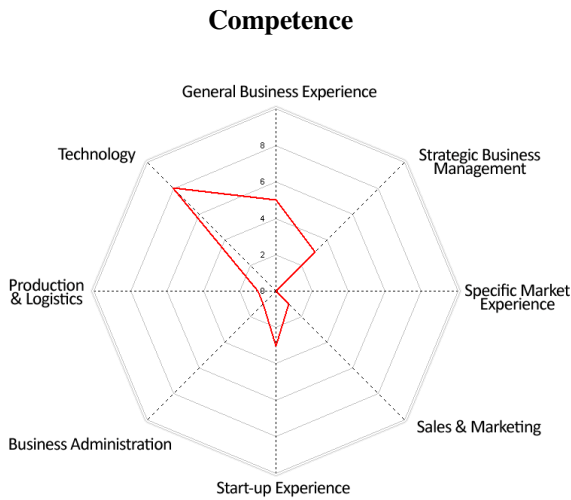
### Experience and competences

- SoftCom Solutions (2005-)  
Lead Developer, System design and implementation
- Socialt Udviklingscenter SUS (2004 - 2008)  
IT consultant, network and server
- BellCom Opensource A/S (2001)  
Webdeveloper

### Area of interest

Software development and system architecture.

## Bergur Ziska



### Personal data

Born: 14.10.1977, Klaksvík, Faroe Islands.  
Currently residing: Copenhagen

### Education

- Stud.Cand.Scient, Computer Science, University of Copenhagen (2009-)
- Bs. Scient, Computer Science, University of Copenhagen (2009)
- Highschool, Sorø Akademi's Skole, Denmark. (1997)

### Main experience

- Ejvind Hald & Co (2004 -)  
Developer and consultant in ...
- Various labor oriented jobs (- 2004)

### Area of Interest

Software engineering and programming

## Barriers and risks

We have multiple threats and need a plan for managing them as they come. The major threats are listed here:

Area	Concern	Precaution
Competition from other taxicab fleet systems	Finn Frogne A/S et al. acts on the new market entry and hurry to update their systems.	<ul style="list-style-type: none"> <li>• Bind our customers to the product.</li> <li>• Use their marketing to boost our product.</li> <li>• Be a step ahead strategy</li> </ul>
The taxi dispatch application is too expensive to build	The fleet management systems require many features.	<ul style="list-style-type: none"> <li>• Talk with customers about their needs and if some features can be omitted until later.</li> </ul>
Partner	Our partner dismiss the relationship	<ul style="list-style-type: none"> <li>• We must make it easy for the partner to help us and the partner may get a good deal from final product.</li> <li>• Get investors in from the start and quick after launch</li> </ul>
Long depreciations on existing dispatch software systems	Large periods between sales	<ul style="list-style-type: none"> <li>• We must find investors early to build up equality capital for two years</li> <li>• Expand to countries within the EU to increase the amount of potential customers.</li> </ul>
Sales/Order sizes	Large orders, few missing sales have a large impact	<ul style="list-style-type: none"> <li>• Expanding to other markets will reduce the risk of going bankrupt due to a few missed sales in a small market with long.</li> </ul>

Figure 4

The initial threat involving the startup of the company is acquiring capital. The fleet system takes a long time to develop and in this period we need external funding. As described in the financial section, getting the first customer on board early in the process will prove vital, both related to financing and domain specific knowledge. The founding teams lack of domain specific knowledge can prove a serious problem if we are incapable to get a partner onboard very early. To manage this, the selected dispatch service has to be interested in exchanging their dispatch system within two years of starting the cooperation with us.

Getting our first customer may be a large problem. We are new in the market, without a product, with no domain specific knowledge and possibly no capital. In this position we need to find a willing customer with whom we could engage in a partnership. This customer has to be a medium sized dispatch services provider, before the fleet system to have a measurable effect and for the revenue to be large enough to keep our equity positive until the next sale.



Figure 5: SWOT analysis describing what help our startup and which poses a threat to the business.

The time between possible sales is anticipated to be multiple years. This is closely related to the depreciation times mentioned and pose a large problem, both in relation to keep our equity positive and in relation to the first customer. The budget collapses if the period between the sales is just a few months longer. It is expected that the customers know this and will there for have little trust in new companies, since they without investors could go bankrupt leaving the dispatch service without support on their newly installed system. In relation to capital, attracting investors will be easier when the first customer has shown enough interest in the company to place the order. For customers to have interest in our solution they need to have some security that will exist years after the system has been installed.

Competitors in the market also pose a large risk. We steal customers from these, thus we expect these established companies to quickly adopt our technology to counter this. The area of which we would be different from the existing products is in software no patterns would protect us from this.

There is no niche in the taxi dispatch market in which established suppliers wouldn't be present. Our product will optimize the distribution of taxis and we have to develop a dispatch system which will compete with existing systems.

It will be crucial to the launch, that we find a partner and an investor within the first months or ideally before the startup of the company. The small customer base and the reliance on few large orders, poses a large risk and will be a large barrier for getting investments. We will need to have all of the most common

features available in order to achieve sales which could lengthen the development time significantly, partially due to our limited domain knowledge. This will raise the risk for the investors.

## Financials

### Investment Analysis

We have estimated the time to create the green dispatch system to take around 1½ year to complete. In this time period we will rely on the founder's initial investment of 500.000 kr., Friends, Family and Fools (FFF) and outside investment. We have estimated the company to be running 4 months on the initial investment, giving enough time to develop a prototype, locate investors and potential customers. Early in this phase we will engage in a working relation with one of the potential customer, whom within the next one to two years expects to change their dispatch system.

In relation to the usage of our dispatch system as mentioned in the previous sections, the dispatch service should have a reasonable size. We have estimated this to be over 40 taxis since a dispatch service at this size will support a large enough residential area for us to draw statistical information. In average the medium customer has 42 taxis in their fleet, which is used to indicate a sale to this size customer in the budget.

To cover a part of the startup costs we will ask the first customer for an upfront payment of 500.000 Kr to be part the development of the system. In return our first customer will get exclusive rights to the product in their area of operations and a 1 Million kr. discount on the finished product. They run a risk both in choosing a newly started company and in paying in average 16% up front.

Due to the long development time of our dispatch system, the initial investment of the founders and first customer will not be sufficient to cover the estimated expenses. As a consequence hereof we need external investments. The needed seed capital along with the first sale will ensure our equity the following year until the second estimated sale.

After the first two customers have bought we estimate a large customer. At this point we will have data to support our green approach and with a proven and stable product, the larger dispatch services would be interested. We will at this point be an established player in the market and the possibility of choosing us as their supplier will be greater.

### Budget

We have estimated the startup expenses to 153.000 kr. including setting up and office for the 5 founders. This includes the servers, computers, software licenses, furniture etc. as listed in the budget spreadsheet. We have estimated the salary pr. founder as 20.000 kr. a month and with the rent, this leads to approximately 4 months of work for the initial invested 500.000 kr. until we will need additional cash transferred into the company. Here we will rely on either the first customer to pay some in advance or an investor or a combination. Getting the first customer aboard early on would be a huge help in developing the product. Along with the extra funds, the feedback from our first customer will be valuable to us.

We have estimated 2 medium sales within the first 3 years. This we find reasonable due to the long depreciation time described earlier and the long-term nature of dispatch systems. We have chosen the particular sales figure due to our categorization of the dispatch services in Denmark. As earlier described



we focus on the medium and large customers, with average fleet sizes of 42 and 368 respectively. We base our sales figures on these averages to get a realistic estimated cash-flow.

In the middle of 2012 we will start expanding to Sweden and Germany. We will at this point in time have two medium and one large dispatch system running our system. To handle the expansion we initially hire in the sales department followed by management. The travels expenses will rise, due to both sales and technical personal needing to service the new markets. Setting up offices in the target countries will follow the first sales. Service contracts with local technical contractors will be setup in this period also to manage support of the customers. This is also the period where we as the founding team will be able to give our self a raise, which is reflected in the salaries of the budget.

In the nature of an IT company, Research and development is a fundamental part of the production. R&D is there for not at part of the budget since this is included in the wages of the System developers and the founders.

### Capital needs

We have estimated the time until the first sale to be 1½ year from startup. Running the company in this time period will cost roughly 2.5Mill kr. minus the 500.000 kr. initially invested, we are short just over 2Mill kr. at the time of the first sale.

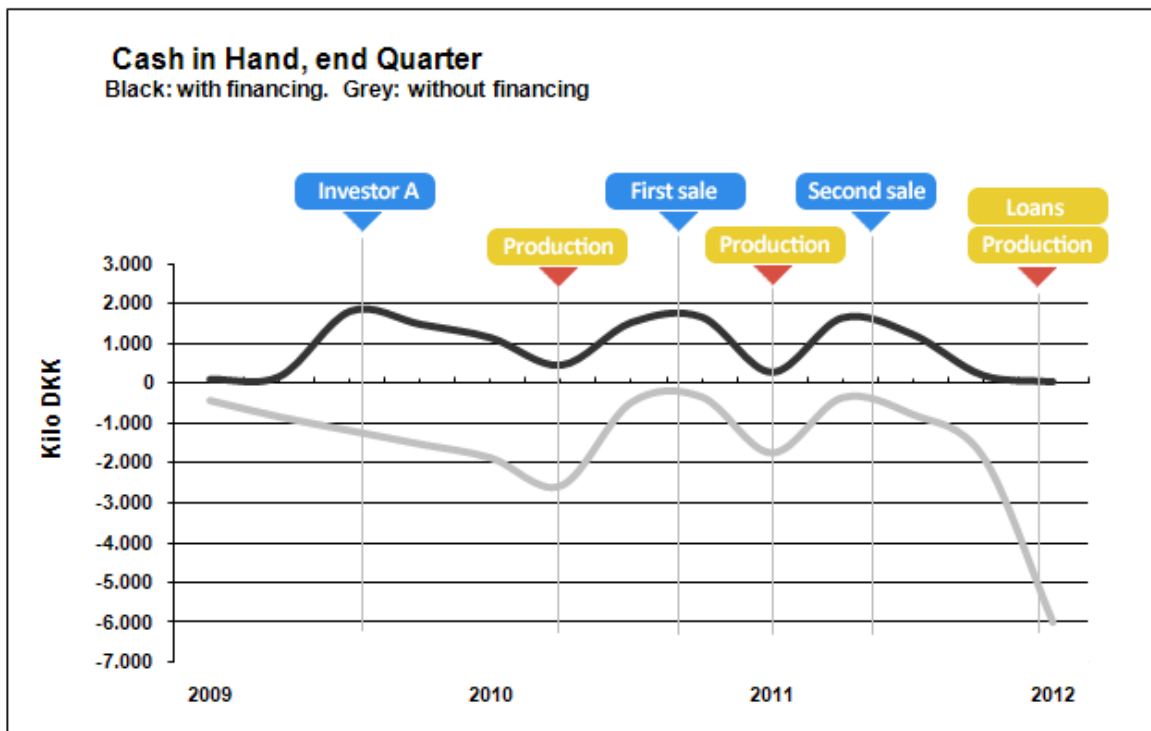


Figure 6

Our capital needs for the first 3 years are well illustrated on figure 6. It shows the cost of purchasing the needed equipment prior to the sales and resulting revenue. It is visible that we need the initial capital from the investor to ensure positive cash-in-hand prior to the sales. As illustrated we expect to have insufficient

cash-in-hand to handle the expenses prior to our first large customer. By acquiring loans to purchase the equipment we will keep our equity positive. We don't expect acquiring this loan to be a problem, since we will have a signed contract for the entire system.

Deals could be made with the subcontractor to pay the shipment over two or more quarters to even out the expenses. Also payments from the customer could be handled in rates.

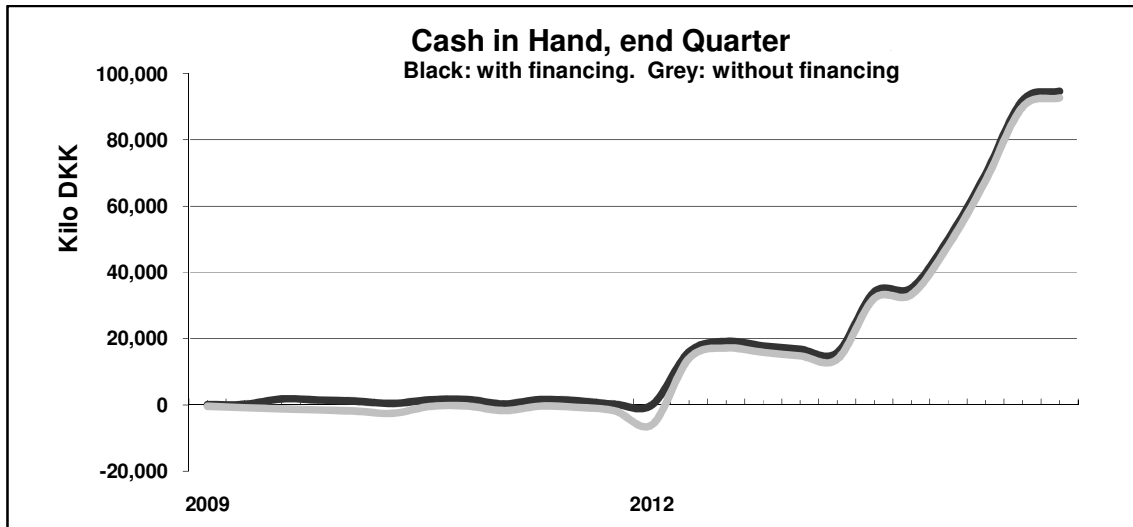


Figure 7

Over the 6 year period in the cash-flow we have estimated the result of our investments in sales and management and by our expansion to Germany and Sweden. This is shown in the figure 7.

## Break even

In early 2013 we estimate break-even. After our first big customer we estimate sales to increase due to reference and market position. We also invest largely to establish ourselves in foreign markets which will have a large cost. Due to the profit from the large sale, it will be possible to finance this without help from investors.

## Ownership

The company will be founded as a Limited Company; each founder will invest 100.000 kr. of his own money to meet the required 500.000 kr.

The first 4 months we rely on the capital invested by the founders, but hereafter we will rely on a business angel or investor to fund the missing 2 Mill. The capital will be spend on product development and thus fall in the seed or pre-seed capital category, where Seed Capital Denmark, Vækstfonden or similar organizations could be possible investor candidates. We hope to have a customer onboard before initiating final negotiations with our investors. This would reduce the risk dramatically thus raising the capital transferred into the company.

Regarding the first customer, it isn't in the interest of the company to offer shares as part of the agreement to fund the development of our green dispatch system. Management problems could arouse

due to situations when we start selling to competitors. By offering other ways to compensate for running the initial risk, the first customer would be offered price cuts and exclusive rights.

There are two possible exit strategies for our company investors. If the company grows rapidly, achieving sales in the neighboring countries, we would be able to buy out our investors with a ROI at a factor 10, within 4 years. Another exit strategy for our investors would be to be bought by a larger international competitor.

For either of the two possible scenarios to occur it is therefore important for the company to succeed in expanding in the European market. If the predicted sales numbers hold, even with minor revenue than anticipated, the company would be an interesting investment opportunity for larger players.

## Contingency plan - First customer reluctant to pay upfront

If there are no interested customers willing to pay upfront we will be able to keep equity if we can get an investor onboard a quarter earlier, as displayed in the cutout from the cash-flow underneath. It would be necessary to take a short term loan to cover expenses related to hardware, which is highlighted in red. This will result in higher risk and therefore a higher loss of shares, but a contingency plan none the less.

<b>Cash flow</b>		<b>2009</b>				<b>2010</b>			
Kilo DKK		1	2	3	4	1	2	3	4
Item	Quarter no								
<b>CASH IN</b>									
From sales		0	0	0	0	0	0	2.520	630
From investor A		0	2.000	0	0	0	0	0	0
1st Customer		0	0	0	0	0	0	0	0
FFF		0	0	0	0	0	0	0	0
Loans		0	0	0	0	0	60	0	0
<b>CASH IN</b>	<b>500,0</b>	<b>0</b>	<b>2.000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>60</b>	<b>2.520</b>	<b>630</b>
<b>CASH OUT</b>									
Salaries		300	300	300	300	300	300	300	420
Rent		25	25	25	25	25	25	25	30
Production		0	0	0	0	0	360	90	0
Travels		0	0	0	0	0	0	0	0
Production tools		0	0					0	0
Initial investments		77	77						
IPR (R&D, patents)		0	0	0	0	0	0	0	0
Repayment incl interest		0	0	0	0	0	0	0	0
Other		15	15	15	15	15	15	15	21
Tax					n/a				0
<b>CASH OUT</b>		<b>417</b>	<b>417</b>	<b>340</b>	<b>340</b>	<b>340</b>	<b>700</b>	<b>430</b>	<b>471</b>
<b>Net cash flow</b>		<b>-417</b>	<b>1.584</b>	<b>-340</b>	<b>-340</b>	<b>-340</b>	<b>-640</b>	<b>2.090</b>	<b>159</b>
<b>Cash in Hand, end qrt</b>		<b>84</b>	<b>1.667</b>	<b>1.327</b>	<b>987</b>	<b>647</b>	<b>7</b>	<b>2.097</b>	<b>2.256</b>
Cash in Hand ex. investments		-417	-833	-1.173	-1.513	-1.853	-2.553	-463	-304

Figure 8

## Conclusion

To sum up there is a substantial market for taxi dispatch systems, but the market is saturated with high entry barriers. Our unique selling point will be the software, which will be difficult to sell as a third-party solution for existing hardware configurations. Therefore to get into the market, we need to bundle it with hardware, an unfortunate necessity and time-consuming task.

Furthermore we are solely depending on few but major sales to have a business - a clear disadvantage when negotiating terms with potential investors/customers. Either we sell and have a business or we go bankrupt. There doesn't seem to be a middle way in this scenario.

However, the pain and the value proposition presented seem reasonable. Our research shows that the share of non-profit driving is high, so addressing the problem would be logical. Interviews also indicate that a greener environmental approach could be adapted by the customers.

In conclusion we must admit that the outlook for a sound business seems somewhat blurry.

## Appendix

### Feedback from mail survey

#### Taxa 4x35 / BVH Taxa

1. *Er der områder hvor i kan forestille jer, at brug af GPS information vil kunne bidrage til bedre disponering?*

Alle Taxi selskaber i København bruger i dag GPS assisteret tur formidling (disponering). Hos Taxa 4x35 sendes nærmeste ledige vogn, kombineret med længst tid ledig, til kunden (med undtagelser). Ved afsendelse forespørges vognene om aktuel position.

Hos konkurrenterne sendes den vogn der har været længst tid ledig i den zone/distrikt kunden bestiller vogn til, vognens udstyr melder sig selv til zone.

2. *Bruges GPS information i jeres eksisterende system?*

Ja.

3. *Hvilke disponeringssystemer bruges i dag?*

Blandt andre:

Taxa 4x35: DDS A/S, <http://www.digital-dispatch.com/>

Dan Taxi, Vest Taxa og Taxi Nord: Finn Frogne A/S: <http://www.frogne.dk/>

4. *Hvilke problemer har i oplevet med jeres system/systemer?*

?

5. *Hvis i skulle vælge en ting, hvad vil i så helst have forbedret i jeres nuværende system/systemer?*

?

6. *Hvad gør i når jeres disponeringssystem går ned?*

Hvis du tænker på afsendelse af ture og turformidlingssystemet går ned, så iværksættes en nødplan hvor afsendelsen foregår via LMR radioen og mobiltelefoner.

#### Sønderborg Taxa

Vi har et moderne trafikdirigeringsanlæg, som tildeler turene til nærmeste vogn. Computeren har hele tiden GPS koordinat på alle vogne. Systemet er udviklet af TaxaData APS i Randers. Vi oplever af og til server nedbrud som medfører, at kontoret ikke er i kontakt med vognene via den normale software. Hvis der er mobildækning sendes turene ud til vognene som SMS beskeder. Hvis der ikke er mobildækning har vi desværre ikke mulighed for at gøre noget.

## **Aarhus Taxa**

1. Vi bruger det i stort omfang i dag
2. Ja
2. OTT
3. Meget sjældne fejl på sattelliterne
4. Pas
5. Manuel tilmelding i zoner

## **Helsingør Taxa**

1. vi benytter allerede GPS
2. ja
3. TDS
4. småfejl (som i alle andre programmer/systemer)
5. -
6. går sjældent ned; kører så på 'tale'.

## **Randers Taxa / TaxaData Aps**

Hej Simon,

Vi arbejder med trafik dirigerings udvikling både til Inhouse og eksternt salg. Frogne er ikke den eneste leverandør, men den største! Du vil kunne finde ca. 10 forskellige trafik dirigerings systemer i DK, hos forskellige taxa centraler.

"forecasting" : Du vil givetvis kunne estimere i Kbhv. hvor gade ture udgør ca 50 % af alle kørte ture, men i provinsen udgør gadeturene kun ca. 10 %, nytteværdien af forecasting vil her være begrænset og ganske usikker.

Vores trafik dirigering er en sammensmeltning af telefoni og data, hvilket lagres historisk og bruges bla. til planlægning af bemanning af centralpersonale m.v.

mvh

Randers Taxa / TaxaData ApS

Direktør Lars Korreborg

-----Oprindelig meddelelse-----

Fra: Simon Andreas Frimann Lund [mailto:saf1@saf1.dk]

Sendt: 9. marts 2009 16:04

Til: Lars Korrebrog

Emne: Re: SV: Spørgsmål til centralsystemer

Hej Lars,

Jeg takker for dit hurtige svar.

Vi har indtil videre fået det indtryk af markedet at der kun er en leverandør (Frogne) men kan forstå på dit svar at der også er centraler der foretrækker inhouse udvikling. Er det en hypotese du kan bekræfte eller afkræfte?

Vi har arbejdet med at udvikle et system til "forecasting" af taxa efterspørgsel baseret på GPS historik. Således at vi med høj præcision kan fortælle hvor der på givne datoer i løbet af året vil være efterspørgsel på taxaer.

Dette kan bruges til effektivt at bemande centraler og taxaer på vejene alt efter efterspørgslen.

Vil et sådan system integreret i jeres egne systemer være interessant?

Eller er den slags analyser allerede standard?

på forhånd tak

Simon A. F. Lund

Lars Korrebrog wrote:

> > Hej Simon

> >

> > Vi henviser til vor hjemmeside...

> >

> > <http://www.randerstaxa.dk>

> >

> > Hvor du kan få svar på dele af dine spørgsmål.

> >

> > Debatten/brugen af GPS/Geo-data er vidtfavnende...



> > Vores dattervirksomhed TaxaData ApS udvikler og producerer Taxa udstyr og

> > som sådan åbner vi ikke op for vore løsninger i den kommercielle del.

> >

> > mvh

> >

> > Randers Taxa / TaxaData ApS

> > Direktør Lars Korreborg

> >

> >

> > -----Oprindelig meddelelse-----

> > Fra: Simon Andreas Frimann Lund [mailto:sagl@sagl.dk]

> > Sendt: 9. marts 2009 14:07

> > Til: lk@randers-taxa.dk

> > Emne: Spørgsmål til centralsystemer

> >

> >

> > Til rette vedkomne,

> >

> > Vi er gruppe studerende fra Københavns Universitet, der er interesseret

> > i de muligheder der er ved brug af GPS data, i forbindelse med

> > disponering af Taxi.

> > Grundet vores baggrund, Datalogi og Geografi, har vi mangler i vores

> > viden om hvorledes taxi disponering foregår, samt hvilke eksisterende

> > løsninger der eksistere og hvad disse allerede understøtter af

> > funktionalitet.

> > Det vil være en stor hjælp for os, hvis i vil svare på følgende seks

> > spørgsmål.

> >

> > - Er der områder hvor i kan forestille jer, at brug af GPS information

> > vil kunne bidrage til bedre disponering?

> > - Bruges GPS information i jeres eksisterende system?

> > - Hvilke disponeringssystemer bruges i dag?

> > - Hvilke problemer har i oplevet med jeres system/systemer?

> > - Hvis i skulle vælge en ting, hvad vil i så helst have forbedret i

> > jeres nuværende system/systemer?

> > - Hvad gør i når jeres disponeringssystem går ned?

> >

> > På forhånd tak,

> > Simon A. F. Lund

> >

> >

> >

> >

> >

> >

## Telephone Interviews

### “Storkøbenhavns taxanævn” (Copenhagen Taxi committee):

1)

#### **Hvem betaler benzin / diesel / vedligeholdelse.**

Vognmanden betaler alle udgifter.

1300 vognmænd

- Henviser til Beretning for 2008.

#### **Er der GPS i bilerne nu? positioneringssystem i forvejen.**

Ikke helt afklaret. Tror vi skal snakke med nogle vognmænd, da de nok har større kendskab til dette.

Ifølge årsrapporten er der GPS i alle taxaer, hvordan information herfra bruges af de forskellige centraler er uvist indtil videre.

#### **Hvordan/hvem bestemmes hvor der skal placeres taxa-holdepladser?**

Kommunalbestyrelse bestemmer pladserne. Taxa selskaberne.

#### **Krav om at taxaer skal holde og vente bestemte steder?**

En taxa må ikke holde og ”fiske” efter kunder uden for taxaholdepladser. Hvis de har lyset tændt og holder stille, skal de holde på en taxa-holdeplads.

#### **Hvilke aktører er der i markedet (taxaselskaber, vognmænd, chauffører) ?**

Kommune / taxa-nævn (kun København)

Centraler (DANTAXI, Amagerbro-taxa, eks. )

Vognmænd, chauffører

#### **Hvordan er strukturen i Sverige, Norge, Finland, Tyskland?**

Tyndt befolkning årsag til svensk model.

Sverige regulerer ikke antallet af vogne. Konkurrence imellem professionelle og vognmænd/

Norge har delvis regulering af antallet af taxa.

#### **Hvilke andre taxa-nævn Eksistere i Danmark? Hvem styre disse nævn?**

Kommuner administrere uden for København.(Køreområderne er blevet større efter kommunesammenlægningen)

#### **Øvrig information**

Henrik Nielsen, Dantaxi – Vognmand og teknisk direktør 70257701

Indtjening. 1600-1700 kr. for en dag. (9-17)

Nogle chauffører tjener omkring 350-400.000 om året.

50% af indkørsel udbetales til chaufføren. 4000-5000 12 timer fra 17-05.

Skal skilte med priserne.

Taxacentraler har fællescentral. Aftaler om at køre på kryds og tværs, gældende i f.eks.

Nordsjælland, hvor taxaer der f.eks. aflevere kunder i andet kørsels distrikt, kan tage en tur i dette distrikt, selvom vognen ikke er tilknyttet dette distrikt.

Firma, Frogne Ishøj. Frogne.dk

Alle bestilte ture går igennem en central.

Det er ikke tilladt at bestille en tur direkte ved en vognmand. Dette skal gå igennem en central.

Udbud af kørsel. Rabatter gives til selskaber (storkunder) af centralerne.  
Konkurrence imellem centraler, er primært at kunne leverer taxaer hurtigt, samt udbud af selve kørslen (pris).  
Inddeling af køre områder. Inddeling i distrikter.

2)

**Har i overvejet at skifte fra brydpunktstakst til paralleltakst?**

Ja. Da Nordsjælland pr. 1 Maj 09 bliver en del af storkøbenhavns taxanævn, er vi i gang med at undersøge takstfordelingen ved brug af paralleltakst i hele området. Det skal undersøges hvordan de forskellige kørselsmønstre i København og Nordsjælland bedst forenes. Dette vil tage omkring et år at fastlægge, hvorefter det vil blive besluttet om paralleltakst-systemet skal benyttes. Det er klart at de miljømæssige hensyn er en del af denne debat.

**Føre i statistik over omkostninger forbundet med skift i disponeringssystemer?**

Nej. Vi har ikke nogen information omkring dette.

**Ville i være interesserede i at støtte et udviklingsprojekt økonomisk, der havde til formål at nedbring CO<sub>2</sub> udslippet fra taxi, ved at ændre disponeringsmetoden?**

Nej, Vi er en kommunal institution og vi har ikke mulighed for at støtte sådanne projekter. Dette er optil markedet selv at gøre dette.

## **Telephone interview with Henrik Nielsen, Technical Director of DanTaxi.**

Spørgsmål og svar fra Henrik Nielsen, Dantaxi.

Baggrund, 32 år inden for branchen.

Direktør for TaxaMotor op til sammenlægning med Codan Taxi.

Selv udviklet system brugt i taxamotor, produceret af Palas informatik, gammel leverandør. Laver bl.a. System for DSB.

*Spørgsmål og svar:*

**Hvordan er arbejdsgangen fra en bestilling til taxaen er der?**

Der er flere metoder hvorpå en taxa kan bestilles. F.eks. Box/ringe til operator/ringe og blive guidede igennem menu. Uanset om turen bestilles igennem en operator eller anden metode. Bestillingen bliver lagt i en database, og derfra udsendt til den chauffør i det distrikt, der har ventet længst på turen. Der bliver ikke taget højde for hvilken taxa der er tættest på, inden for distriktet, da det forsøges at fordele turene fair imellem chaufførerne. Problemet er at der ofte er flere chauffører end der er kunder, hvorved en "tætteste" på fordeling, vil kunne resultere i at chaufføren f.eks. Fisker hvor der er gode ture. Der arbejdes på en model, hvor tættest på bruges i tidsrum hvor der er flere kunder en taxi, da det her vil være hensigtsmæssigt hurtigt at få kunderne ind i vognen og af sted. I dette tilfælde vil alle chauffører få ture, hvorved de ikke vil føle at de bliver forskelsbehandlet.

**Hvem betaler for installation af udstyr i en taxi?**

I Dantaxi er det centralen der betaler udstyret der installeres i taxaen, hvilket er normalt i følge Henrik. Vognmændene betaler for den tid det tager at installere systemet.

**GPS i alle taxi i landet? Eller kun København?**

Ja, i København, men det er ikke alle taxi der har GPS. Henrik brugte landtaxi som eksempel, hvor det meste sker over en mobiltelefon. Det er dog mere reglen en undtagelsen at der er GPS i bilerne. Information fra GPS bruges i en GIS applikation, hvor positionen fra taxien bruges til at bestemme hvilket distrikt vognen er i. GPS information sendes til centralen ved turens start og slutning, samt hvert 2/5 min. Det er således til dels muligt at plotte en rute for taxien efter en tur er kørt. Andre hændelser logges også, så som overfaldsalarm, hvorfra GPSdata logges kontinuert herefter. Ser en chauffør en der venter på en taxa, hvor han allerede køre end tur, har chaufføren mulighed for at "logge" dette ind til centralen. Dette bruges dog ikke meget.

#### **Bestemmer centralerne hvilket udstyr der skal være i bilerne?**

Ja, Da udstyret i bilerne er tæt bundet til det brugte disponeringssystem, (hvilket er gældene for frogne, og andre ifølge Henrik). Skal et disponeringssystem udskiftes, skal udstyret i bilerne også skiftes!

#### **Hvad er omkostningerne for en chauffører, for at være en del af Dantaxi?**

Det koster 1080kr/uge for at have en vogn tilmeldt Dantaxi.

#### **Hvor stor betydning har disponeringssystemet?**

Stor! Der er ca. 100 bestillinger i timen. De har mulighed for at kommunikere med vognene via telefon eller radio, men dette er ikke hensigtsmæssigt!

#### **Hvilken finansieringsmodel bruges for jeres disponeringssystem? leasing/køb? Herunder evt. Service aftale?**

Leasing, eller hvad der nu er mest oppe i tiden/billigst.

#### **Gør i brug af analyser af kørselsadfærd og positioner for bestillinger, i jeres disponering?**

Nej, ikke generelt. De har lavet nogle små udtræk, f.eks. En top 10 over distrikter og lignende. Information fra deres system bliver ligeledes ikke brugt på nationalt plan, eller kommunalt plan, til f.eks. Placering af taxiholdepladser eller lignende. Dispatch system, fra Frogne, viser bestilte ture, således at chauffører f.eks. Kan vælge at vente på denne, i stedet for at køre tilbage.

#### **Hvilket mønstre viser erfaringen der er?**

Først og sidst på måneden har betydning for kørsel. Ligeledes er udbetaling af børnepenge også en faktor der kan ses i antallet af kørsler. Skiftende vejr har også betydning for kørslen. Specielt på dage hvor der er byger eller lignende, hvor folk kan bliver overresket over vejret, er der flere kørsler. Dette er dog ikke tilfældet, hvis der f.eks. Er lovet heldagsregn, da folk har haft mulighed for at planlægge.

#### **Indenfor hvilke områder er der konkurrence imellem taxicentralerne?**

Primært konkurrer centraler indbyrdes på at have mange chauffører under sig og i mindre grad på pris til storkunder. De vigtigste elementer til at få en stor chauffør skare er ifølge Henrik følgende:  
– Positiv intern tone overfor vognmændene. (f.eks. Er "Kun Dansker chauffører" IKKE god tone)  
– Udstyr der på centralen og i bilerne. Retfærdigheden. Gennemsigtige forhold(MEGET vigtigt)  
– Gode erhvervsture, f.eks. DSB, SAS Mærsk,.. lignende.  
Forskellene imellem centralerne er grundlæggende pris/kvalitets bestemt, hvor kvaliteten er møntet på udstyr/tone og prisen er det ugentlige gebyr for at være en del af en central. (overfor vognmænd/chauffør).

#### **Hvordan er løn niveauet imellem chauffører? Spændet fra mindste til største lønninger? pr. Time.**

*Endetalsundersøgelse: (Københavns taxinævn)*

240 pr. Time i gennemsnit. Store variationer, selv imellem chauffører der køre samme tidspunkter. Her spiller Heldfaktoren selvfølgelig ind, men også at have en god "næse" for at finde ture er et væsentligt element.

### **Hvordan fungerer et Taxa meter?**

Der er to typer taxameter. Brudpunktstakst, hvor der er to tilstande; Køre eller vente. Her udregnes prisen enten som ventetid, pris/min. Eller som køretid pris/km. Dette bestemmes af hastigheden, hvor f.eks. 25Km timen betegnes som "vente tid". Der er således en fordel ved at køre hurtigt, da forholdet imellem tid/turens pris er bedre hvis der køre hurtigt!

En anden metode er "Parallel taxa" taxameter, hvor ventetid og køretid beregnes samtidig, og begge indgår i den samlede beregning af turen. Her er det ingen fordel af køre hurtigt frem for at overholde færdselsreglerne, ligesom det er nemt efterfølgende at beregne hvor stor del af prisen for turen, hvor vente- og køretid. Dette benyttes i Aalborg og Århus, samt Sverige, men ikke i København. Dette skyldes at det skal bestemmes kommunalt, hvorledes taxameterne indstilles. Selve taxameteret er elektronisk og en del af kørecomputeren, hvorved selve opdateringen fra "Brudpunktstakst" til "Parallel", blot er en opdatering.

### *Information*

Antal systemer: Omkring 10 i Danmark.

Fogne – stor leverandør i Danmark.

4x35 bruger et engelsk system,

Capsch et østrisk system.

TDS et Norsk firma,

lille dansk firma Euro sys, meget lille firma.

Stor taximesse i tyskland, hvert Andet år. (08' var den sidste) Alt hvad der kan kravle og gå af taxiudstyr.

Dele af deres (TaxaMotors) udstyr er blevet modaniseret, men de har dele der går tilbage til 80'erne ,....

## **Mails correspondence between Henrik Nielsen and us.**

1)

Hej Henrik,

**Endnu engang vil jeg takke for tiden du afsatte i går, Mandag. Dine svar har givet os alle i gruppen væsentlig større indsigt i taxi-markedet.**

**De har også spundet en del spørgsmål af sig, som vi håber du vil være behjælpelig med.**

**Jeg har prøvet at gøre dette så kort som muligt. Du fortalte at de forskellige distrikter er opdelt i zoner.**

**Skyldes dette gammel arv, eller er der problematikker forbundet med dynamiske zoner, der tager udgangspunkt i kundens placering?**

Det skal være et gennemsigtigt, retfærdigt system for føreren. Derfor!

**Er zone-opdelingen bestemt af kommune eller fastlægges disse af de enkelte centraler?**

**- Såfremt dette bliver bestemt af centralerne, hvilke kriterier er stillet til en zone?**

Vi laver selv distrikterne. Typisk er de arealmæssigt små i tæt bebyggede områder (~ mange ture/areal) og større og større jo længere væk man kommer fra centrum.

**Er der en sammenhæng imellem zoner og taxi holdepladser?**

Ikke normalt. Føreren vælger selv, om han vil køre rundt i distriktet eller holde stille. Dog kan man vælge at lave 'radio-holdepladser' f.eks. ved hospitaler, hvorfra der 'går' attraktive, lange patientture. Herved bliver det den fysiske placering i køen på holdepladsen, der afgør hvilken vogn der skal have næste tur.

**I tilfælde af særlige begivenheder, er det muligt at få oprettet midlertidige taxi-holdepladser? Såfremt dette udnyttes denne mulighed?**

Ja. Men det sker sjældent...

**I relation til at give taxikørsel en grønnere profil, er vi interesserede i at vide hvor meget chaufførene kører rundt efter ture. Da de ikke må holde og "fiske" turer uden for holdepladserne, vælger chaufførene så at køre rundt for at finde kunder?**

Ja. Og det er jo også en kvalitet for kunderne, at man kan gøre sig håb om at stoppe en ledig taxi på gaden. Det kan også spare de tomme 'fremkørsels-km' til en kunde, der har bestilt vognen. Dantaxi plejer at være et af de bedste selskaber til at minimere tomkørsel. Vi ligger typisk omkring 53% besatte km. Amager-Øbro plejer at ligge i den anden ende af skalaen med 44-45 %.

**I gruppen opstod en usikkerhed omkring, om forholdende imellem software og hardware, da jeg desværre ikke formåede at formulere spørgsmålet præcist.**

**Vi vil derfor gerne vide, om det eksistere end kontraktlig binding af disponeringssoftware og den installerede hardware i bilerne eller om bindingen er af teknisk karakter? (kryptering, selvudviklede protokoller eller lign.)**

Den er af teknisk karakter.

**Vi er ligeledes interesserede i, om du har kendskab til modeller/løsninger/muligheder der vil gøre disponeringen mere fair end den allerede er? Hertil vil vi høre om du har erfaring med indkørselsbestemt fordeling af kunder, frem for antallet af ture? (Som jeg fik indtryk af var metoden i brugte til fordeling af bestilte ture).**

Chauffører er provisionslønnede – og ofte typer, der 'er deres egen lykkes smed'. De ønsker lige vilkår og muligheder – men bestemt ikke nogen indkomstudligning.

**Til sidst, er vi interesserede i hvad et disponeringssystem koster? I dette henseende, hvor store omkostningerne der er forbundet med overgangen imellem disponeringssystemer.**

Det kan man ikke uden videre sige – det afhænger af mange ting. Men priser på 75.000- 125.000 pr. bil inkl. mobiludstyr og centralsystem vil nok ikke være helt af vejen....

**På forhånd tak,  
Johannes Lund**

2)

Hej Henrik,

Vores kursus er ved at slutte og har i det henseende en sidste forespørgsel, som jeg håber du kan hjælpe mig med.

**Hvormeget koster en taxa i brændstof/vedligeholdelse pr. km ?**

Brændstof ca. 60 øre/km – 100.000 km /år Vedligeholdelse ca det samme

**Vil i være interesseret i et system, der kunne mindske de spildte kørsels kilometer?**

- **Hvor stor en sækning vil være interessant?**

Ja, det er klart – men modstridende er stadig, at det er vigtigere at chauffører/vognmænd følger, at de selv bestemmer. Og at det er klare, enkle regler, der benyttes til dispatch.

**Vil i være interesseret i at omlægge kørselsbetaling, således at dette inkluderer en 'grøn'-bonus? - Denne skulle beregnes ud fra kørselsmønster, således at chauffører der køre miljøvenligt bliver belønnet?**

Ja, det kunne være interessant for større vognmænd, der beskæftiger chauffører

**Såfremt i kunne markedsføre jer, som værende "grønne"/"det miljø ritgite taxa-valg", tror du, at dette vil give jer en fordel i forbindelse med stor-kunde aftaler?**

Ja – helt klart

På forhånd tak

Mvh,

Johannes

## **Mails correspondence with Færdselsstyrelsen, Bilteknisk afdeling (Road Safety and Transport Agency):**

Til rette vedkommende,

Vi er en gruppe fra København Universitet der er i gang, med at undersøge hvilke muligheder der er for brug af GPS data i taxa branchen.

Efter at have kigget rundt på jeres hjemmeside har vi ikke kunne finde noget information om evt. krav til udstyr/software til brug inden for området.

Vi håber i kan vær os behjælpelig i denne situation, da vores viden inden for dette område ikke er stort.

Vi vil gerne vide, om der er krav om godkendelse:

- af udstyr til brug i taxa/transport- biler?

- af software der bruges til disponering af taxi/vognmænd?

Mvh,

Johannes Lund



-----  
Hej Johannes Lund,

Du spørger ret generelt og det gør det svært at give et præcist svar.

Når du siger taxa-udstyr er det nærliggende at nævne taxameter og kørebog. Taxameter skal naturligvis være godkendt, og der er også for nogen år siden blevet åbnet op for muligheden for at benytte elektroniske kørebøger i stedet for at skrive km-tal mv. ind manuelt. Disse ting fremgår af bekendtgørelse om særlige krav til taxier, som du kan læse her:

<https://www.retsinformation.dk/Forms/R0710.aspx?id=22551>

Hvad angår software til disponering er der ingen godkendelseskrav. Her må markedet styre, hvad der sælges.

Har du flere spørgsmål er du velkommen til at vende tilbage.

Med venlig hilsen,  
Martin Hellung-Larsen, Civilingeniør  
**Færdselsstyrelsen, Bilteknisk afdeling**  
**Road Safety and Transport Agency**  
Adelgade 13  
DK-1304 København K  
Tlf.: +45 33954353  
Fax: +45 33381426  
e-mail: [mhl@fstyr.dk](mailto:mhl@fstyr.dk)  
[www.fstyr.dk](http://www.fstyr.dk)

# Spreadsheets

**Cash flow**

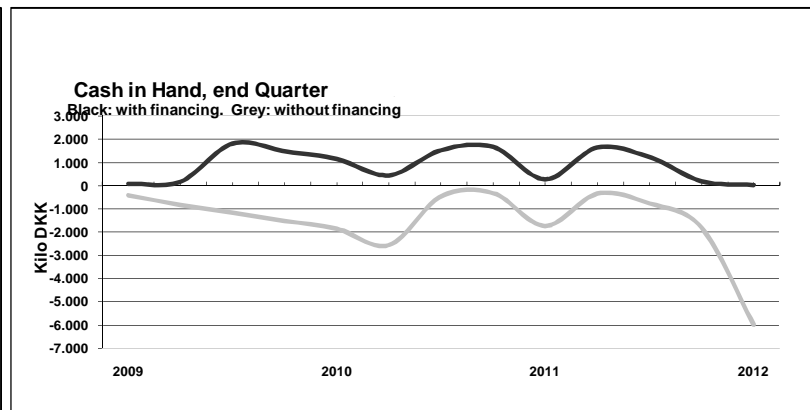
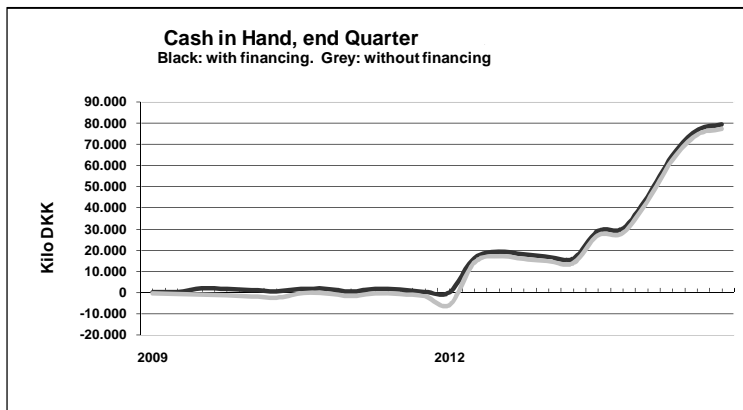
**Salaries**

**Market**

**Product unit costs**

### Cash flow

Kilo DKK	2009				2010				2011				2012				2013				2014				
Item	Quarter no	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>CASH IN</b>																									
From sales		0	0	0	0	0	0	2.520	630	0	2.520	630	0	0	22.080	5.520	2.520	3.150	5.670	23.340	8.040	22.710	27.600	28.680	8.310
From investor A		0	0	2.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1st Customer		0	500	0	0	0	0	-1.000																	
FFF		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loans		0	0	0	0	0	0	0	0	0	0	0	0	4.000	-4.000	0	0	0	0	0	0	0	0	0	0
<b>CASH IN</b>		<b>500,0</b>	<b>0</b>	<b>500</b>	<b>2.000</b>	<b>0</b>	<b>0</b>	<b>1.520</b>	<b>630</b>	<b>0</b>	<b>2.520</b>	<b>630</b>	<b>0</b>	<b>4.000</b>	<b>18.080</b>	<b>5.520</b>	<b>2.520</b>	<b>3.150</b>	<b>5.670</b>	<b>23.340</b>	<b>8.040</b>	<b>22.710</b>	<b>27.600</b>	<b>28.680</b>	<b>8.310</b>
<b>CASH OUT</b>																									
Salaries		300	300	300	300	300	300	300	420	930	930	930	930	1.200	1.200	1.760	3.030	3.030	3.220	3.220	3.460	3.770	4.010	4.360	4.870
Rent		25	25	25	25	25	25	25	30	40	40	40	40	50	50	75	130	130	140	140	150	165	175	190	210
Production		0	0	0	0	0	360	90	0	360	90	0	0	2.826	707	360	450	735	2.988	1.067	2.916	3.533	3.671	1.101	90
Travels		0	0	0	0	0	0	0	20	30	30	30	30	30	70	80	100	150	150	200	200	150	120	100	100
Production tools		0	0					0	0				0	0											
Initial investments		77	77																						
IPR (R&D, patents)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Repayment incl interest		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other		15	15	15	15	15	15	15	21	47	47	47	47	60	60	88	152	152	161	161	173	189	201	218	244
Tax				n/a					0				0				0			5.436					10.689
<b>CASH OUT</b>		<b>417</b>	<b>417</b>	<b>340</b>	<b>340</b>	<b>340</b>	<b>700</b>	<b>430</b>	<b>491</b>	<b>1.407</b>	<b>1.137</b>	<b>1.047</b>	<b>1.047</b>	<b>4.166</b>	<b>2.087</b>	<b>2.363</b>	<b>3.862</b>	<b>4.197</b>	<b>6.659</b>	<b>10.224</b>	<b>6.899</b>	<b>7.806</b>	<b>8.177</b>	<b>16.658</b>	<b>5.514</b>
Net cash flow		-417	84	1.660	-340	-340	-700	1.090	139	-1.407	1.383	-417	-1.047	-166	15.993	3.157	-1.342	-1.047	-989	13.116	1.141	14.904	19.423	12.022	2.796
<b>Cash in Hand, end qrt</b>		<b>84</b>	<b>167</b>	<b>1.827</b>	<b>1.487</b>	<b>1.147</b>	<b>447</b>	<b>1.537</b>	<b>1.676</b>	<b>269</b>	<b>1.653</b>	<b>1.236</b>	<b>190</b>	<b>23</b>	<b>16.017</b>	<b>19.174</b>	<b>17.832</b>	<b>16.785</b>	<b>15.797</b>	<b>28.913</b>	<b>30.054</b>	<b>44.957</b>	<b>64.381</b>	<b>76.403</b>	<b>79.199</b>
Cash in Hand ex. investment		-417	-833	-1.173	-1.513	-1.853	-2.553	-463	-324	-1.731	-347	-764	-1.810	-5.977	14.017	17.174	15.832	14.785	13.797	26.913	28.054	42.957	62.381	74.403	77.199

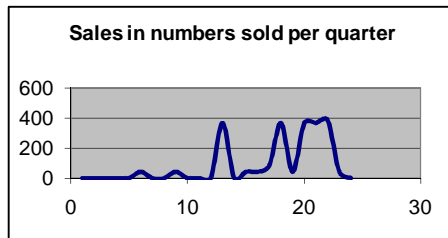


Total invested 0 Kilo DKK  
(Equity capital)

Market entry scenario

Sales price pr Taxi 75.000 DKK

Unit sale	2009				2010				2011				2012				2013				2014							
	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt				
Denmark																												
Sweden						42				42				368					42			42				368		
Germany																												
Netherlands																			42							368		
Belgium																												
Luxembourg																												
Remaining Europe!																												
	0	0	0	0	0	42	0	0	0	42	0	0	0	368	0	42	42	84	368	42	368	368	368	386	42	42	0	0
Cash out, production	0	0	0	0	0	450.240	0	0	0	450.240	0	0	0	3.532.800	0	450.240	450.240	806.400	3.532.800	450.240	3.532.800	3.532.800	3.532.800	3.705.600	450.240	450.240	0	0
Cash in, sales	0	0	0	0	0	0	3.150.000	0	0	0	3.150.000	0	0	0	27.600.000	0	3.150.000	3.150.000	6.300.000	27.600.000	3.150.000	27.600.000	27.600.000	28.950.000	28.950.000	3.150.000	0	0
Registered sales	0	0	0	0	0	3.150.000	0	0	0	3.150.000	0	0	0	27.600.000	0	3.150.000	3.150.000	6.300.000	27.600.000	3.150.000	27.600.000	27.600.000	27.600.000	28.950.000	3.150.000	0	0	0
80% Paied due time	0	0	0	0	0	0	2.520.000	0	0	2.520.000	0	0	0	0	22.080.000	0	2.520.000	2.520.000	5.040.000	22.080.000	2.520.000	22.080.000	22.080.000	23.160.000	2.520.000	0	0	0
Deptors, paying 1 qt. late								630.000		0	0	630.000		0	0	5.520.000		630.000	630.000	1.260.000	5.520.000	630.000	5.520.000	5.520.000	5.520.000	5.790.000	0	0
80% Creditors paied due	0	0	0	0	0	360.192	0	0	0	360.192	0	0	0	2.826.240	0	360.192	360.192	645.120	2.826.240	360.192	2.826.240	2.826.240	2.964.480	360.192	360.192	0	0	0
Creditors(late payment to subcontr.)							90.048	0		0	90.048	0		0	706.560	0	90.048	90.048	161.280	706.560	90.048	706.560	706.560	741.120	90.048	90.048	0	0
Net cash flow from sales	0	0	0	0	0	-360.192	2.429.952	630.000	-360.192	2.429.952	630.000	0	0	-2.826.240	21.373.440	5.159.808	2.069.760	2.414.832	2.682.480	22.273.248	5.123.712	19.177.200	23.928.960	27.578.888	8.219.952	0	0	0
End yr.:	2008	2009	2010	2011	2012	2013																						
Deptors	0	0	0	630.000	630.000	5.790.000																						
Creditors	0	90.048	0	90.048	706.560	90.048																						
NET	0	90.048	0	-539.952	76.560	-5.699.952																						





Organisation		Head count 2009				2010				2011				2012				2013				2014				
		1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	1. Qt	2. Qt	3. Qt.	4. Qt	
Management														1	1	2	4	4	4	5	5	5	6	6	7	8
Sales department									1	2	2	2	2	2	2	4	8	8	8	8	10	10	10	11	13	
System Development										5	5	5	5	5	6	6	6	8	8	7	7	7	7	9	10	
Information Gathering																1	3	3	5	5	5	7	7	8	8	
Founders		5	5	5	5	5	5	5	5																	
Admin										1	1	1	1	1	1	2	3	3	3	3	3	3	3	3	3	
People		5	5	5	5	5	5	5	6	8	8	8	8	10	10	15	26	26	28	28	30	33	35	38	42	
<b>Salaries</b>																										
Management	150 Kilo DKK	per quarter																								
Sales dept.	120 Kilo DKK	per quarter																								
System Development	120 Kilo DKK	per quarter																								
Information Gathering	80 Kilo DKK	per quarter																								
Admin	90 Kilo DKK	per quarter																								
Founders	60 Kilo DKK	per quarter																								
<b>CASH BURN on HEADS</b>		2009				2010				2011				2012				2013				2014				
Kilo DKK		300	300	300	300	300	300	300	420	930	930	930	930	1.200	1.200	1.760	3.030	3.030	3.220	3.220	3.460	3.770	4.010	4.360	4.870	
Rent in 1000		25	25	25	25	25	25	25	30	40	40	40	40	50	50	75	130	130	140	140	150	165	175	190	210	
Rent per head	5 Kilo DKK	per quarter (Estimated expenditures to rent office and/production facility per employee per quarter)																								

## Product unit costs

Item no.		DKK			Price per vehicle (Bill of Materials = BOM)			
		No. per prod.	1 - 10 pc	11 - 50 pc	51 - 500 pc	40 - 50 Pc	50 - 100 pc	100 - 500 pc
1.	Computer	1	3.000	2.800	2.500	3.000	2.800	2.500
2.	Touch Screen monitor	1	1.500	1.400	1.300	1.500	1.400	1.300
3.	Taxameter Display	1	200	170	100	200	170	100
4.	GPS system	1	1.700	1.500	1.300	1.700	1.500	1.300
5.	CreditCard system	1	1.500	1.350	1.200	1.500	1.350	1.200
6.	Installation	1	4.000	3.500	3.200	4.000	3.500	3.200
7.		1	0	0	0	0	0	0
8.		1	0	0	0	0	0	0
9.		1	0	0	0	0	0	0
10.		1	0	0	0	0	0	0
11.	Test	0	200	180	150	0	0	0
12.	Packaging	0	200	180	150	0	0	0
	<b>Unit price</b>					<b>11.900</b>	<b>10.720</b>	<b>9.600</b>