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CityMob
Prototype Development of a Commercial City Information Portal for Mobile Phones

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Problem Description

The development of more advanced mobile technology has made it possible to implement many services, which are already available on the Internet, on mobile phones. In addition, new services mobile-specific services are emerging, most notably location-based services.

Making information easily available has been the basis of many successful business-strategies. City guides are a popular service in most of the big cities, offering information on everything from concerts to restaurants in both paper form and on the web. We want to offer this information in application form for handheld devices. To increase the value of the application, we will consider incorporating additional services, such as automatic positioning, user generated content and community.

We will in this master thesis investigate aspects related to the business opportunity for a mobile application providing city information. A business plan is going to be formulated.

A prototype of the system is going to be designed and implemented.

Assignment given: 01. February 2007
Supervisor: Jan Arild Audestad, ITEM

Abstract

The extensive list of cultural offerings in big European cities has resulted in a variety of city guides in magazines and on the Internet. However, users often require information when they are on the run. A city guide available on mobile phones would therefore be advantageous in many situations.

In January 2007, the company CityMob was founded by four students in order to commercialise the idea of a city guide for mobile phones. A working prototype of the system has been designed and implemented. The prototype consists of a J2ME client, which is installable on mobile phones, and communication with an internet server using the mobile data access networks.

Furthermore, business aspects related to the idea has been investigated and market research has been carried out. A business plan, which is based on the findings, has been formulated.

Based on contributions from the prototype and the business plan, CityMob has obtained grants of, in all, 135 000 NOK. Moreover, a collaboration with the Munich located city magazine, Munichx, has been established. On this basis, a foundation for a viable company has been laid. CityMob will, in collaboration with Munichx, launch a final version of the mobile city guide on the German market 22 September 2007.

After the scope of this thesis, several items are left to be resolved before the service is ready for market launch. Firstly, device portability and content provider scalability has not been emphasized while developing the prototype. Secondly, CityMob must enter into additional collaborations in order to provide a complete system.

Preface

This Master thesis describes the work done by Jan Sindre Isene and Petter Johannessen from January 2007 to July 2007. During this period, the authors started the company CityMob in Munich, Germany. The company's continued operation, after the scope of this thesis, has been assured. Additional members of CityMob were Axel Lefébure and Håkon Abrahamsen. We thank them for a successful collaboration.

First and foremost we would like to thank our adviser Jan Arild Audestad at NTNU/Telenor for invaluable guidance. His deep understanding of the telecommunication market is nothing but impressive.

Secondly, we would like to direct our thanks to UnternehmerTUM and their employees. Bernard Doll has been our main councillor and has helped us avoid several initial pitfalls. Tobias Ullman has been our main technical adviser, and has contributed through his knowledge and understanding of mobile applications.

Finally, we thank various people who have contributed to CityMob:

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List of abbreviations

3GPP 3rd Generation Partnership Project

API Application Programming Interface

ARPU Average Revenue Per User

AWT Abstract Windowing Toolkit

B2B Business to Business

B2C Business to Consumer

CDC Connected Device Configuration

CLDC Connected Limited Device Configuration

CPU Central Processing Unit

CVC Corporate Venture Capital

EDGE Enhanced Data for GSM Evolution

GPRS General Packet Radio Service

GPS Global Positioning System

GSM Global System for Mobile communication

HSDPA High-Speed Downlink Packet Access

HTTP Wireless-Hypertext Transfer Protocol

IP Internet Protocol

ISP Internet Service Provider

J2EE Java 2 Enterprise Edition

J2ME Java 2 Micro Edition

JAD Java Application Descriptor

JAR Java Archive

JVM Java Virtual Machine

KVM Kilo Virtual Machine

LBS Location Based Services

LAN Local Area Network

LCS Location Content Service

LCDUI Liquid Crystal Display User Interface

MIDlet Mobile Information Device toolkit

MIDP Mobile Information Device Profile

MMS Multimedia Messaging System

MNO Mobile Network Operator

MVNO Mobile Virtual Network Operator

OS Operating System

OTA Over-the-Air

PDA Personal Digital Assistant

POI Point of Interest

PSTN Public Switched Telephone Network

QoS Quality Of Service

RMS Record Management Store

SIM Subscriber Identity Module

SMS Short Message Service

TCP Transmission Control Protocol

TDMA Time Division Multiple Access

UDP User Datagram Protocol

UGC User Generated Content

UI User Interface

UMTS Universal Mobile Telecommunications System

URC User Rated Content

URL Uniform Resource Locator

VC Venture Capital

WAP Wireless Applications Protocol

WAN Wide Area Network

WLAN Wireless Local Area Network

Part I

Introduction

Introduction

Germany has a total of 13 cities which have more than 500 000 inhabitants. Within the European Union, the corresponding number is 54. Naturally, these populous cities have an extensive list of cultural offerings. In order to keep oneself oriented, people need means of information structuring. This situation has resulted in a variety of city guides on the Internet and in magazines. These establishments provide an organized overview of city content. Typical examples are restaurants, theatres, concerts, festivals and clubs. The information available in regards to such venues include opening hours, location, contact details, critic rankings, prices and similar. The city guides, which are available on the Internet, give user the possibility to search through their content based on their personal criteria. Many people consider these pages to be helpful and utilise them frequently in order to plan their social activities. Some establishments have also build communities around their user bases.

The mobile technology has been significantly improved over the last years. Mobile networks have become packet switched, the bandwidth has increased and the mobile phones have become more advanced and user friendly. At the same time, mobile phone usage has become cheaper. This evolution, along with the fact that western countries have close to 100% mobile phone penetration, have resulted in an expected growth in the mobile phone application market.

The mobility characteristic brings several unique benefits. A mobile phone application offers ubiquitous access, localisation and reachability independent of time and place. In addition, the fact that most people always have their mobile phone at hand, provides convenience.

The origin of this project is the concept of a commercial city information service for mobile phones. The service should provide the same type of information as its counterparts already existing on the Internet. The service should function as a compliment to the web pages and magazines which offer similar information. Furthermore, the mobile service is imagined to be the favoured information source in cases when neither magazines nor computers are available. In order to increase the value of the application, incorporation of additional features, such as automatic positioning, user generated content and community, are considered to be possible extensions.

1.1 Project Outline

This project results from the idea of building and launching a city information service for mobile phones. The service has been named *MyCityGuide* and the company *CityMob* has been founded in order to commercialise the idea. The objective of the project is a successful launch of MyCityGuide on the German market and thereby establish a viable company.

There are four members of this project. All are major students belonging to the Norwegian University of Science and Technology. Two Master thesis have been formulated: Axel Lefebure and Håkon Abrahamsen are writing one thesis together, while this thesis has been composed by Petter Johannessen and Jan Sindre Isene. The combination of the two thesis should lay the foundation, upon which, a successful service can be built.

It is important to note that this project is *not* a continuation of previous work. The idea was devised by Petter Johannessen in December 2006 and the project started from scratch in January 2007. This report therefore describes the entire process from concept, through company founding and prototype development, until a customer is awaiting a finalized version. The final product version is going to be launched on the German market 22 September 2007.

1.2 Thesis Objective

The main objective of this thesis is to create the foundation for a successful launch of MyCityGuide on the German market. This work constitutes of:

- A working prototype of the system should be designed and implemented. The prototype should provide CityMob with a "working model" for demonstration or and thereby contribute to a collaboration with city magazines.

- In order to create a successful prototype, both technological and business aspects need to be analysed. A business plan based on the findings should be formulated. The business plan should shed light over the important component of CityMob's business. Furthermore, attempts to create a viable business model should be performed.

1.3   Thesis Collaboration and Mutual Work

Two Master thesis belong to this project. They have different and complimentary focus. The thesis written by Axel Lefebure and Håkon Abrahamsen has its main focus on user acceptance and system design. Their thesis is called "Development of a City Mobile Application" [1].

The prototyping development was a substantial part of the project which heavily involved all of the team's core members. A prototype description therefore constitutes a considerable component in both of the two thesis. The prototype is described in Chapter 14. The description has been written by Axel Lefebure but it has been modified in order to correspond to this report. Furthermore, a presentation of the framework, which was used to develop the prototype, can also be found in both thesis. It has been composed by Håkon Abrahamsen and can be found in Chapter 14.

The chapters, which are describing the Java Micro Edition 4, the mobile access networks 5, and positioning techniques 6, have been composed by Jan Sindre Isene. These chapters have been reproduced in Lefebure's and Abrahamsen's report [1].

1.4   Readers Guide

The reader's guide is meant to describe the different parts of this document, as it is rather large and divided into both parts and chapters. This section lists each chapter with a short summary of the content.

Part 1: Introduction. This part contains the introduction, the background and context for this thesis, and the business idea which is the origin of this thesis.

- **Chapter 1: Introduction.** This chapter consists of an introduction to the thesis, an outline of the project and a section which presents the objective of this Master thesis. Furthermore, an explanation of how this thesis relates to the other thesis [1], which belong to the same project, and which chapter they have in common, is given here.

- **Chapter 2: Business Idea.** This thesis and CityMob origins from the business idea of a city information portal for mobile phones. A thorough description of the concept is given in this chapter. The rest of the work found in this thesis results from the attempt to commercialize this idea.

- **Chapter 3: Background and Context.** An outline of the background of this Master thesis and its context can be found in this chapter. It includes a presentation of the project members, the funding of CityMob, and the invaluable incubator UnternehmerTUM.

Part 2: Technology Background. This parts presents the technologies that are most relevant for the realisation of MyCityGuide.

- **Chapter 4: Java Micro Edition.** This chapter describes the programming language, J2ME, which has been been used for developing the MyCityGuide prototype.

- **Chapter 5: Mobile Access Networks.** MyCityGuide utilizes mobile access networks in order to communicate with CityMob's web-server. The possible access networks are outlined in this chapter.

- **Chapter 6: User Positioning.** In order to use location as a context, MyCityGuide must know the location of its users. This chapter presents the different positioning techniques.

- **Chapter 7: The play.Tools Framework.** A framework for mobile application development called play.Tools has been utilized in the developement of the MyCityGuide prototype. A description of play.Tools can be found in this chapter.

Part 3: Business Plan Prestudy. This part consists of analysis of business aspects related to the commercialisation of MyCityGuide.

- **Chapter 8: Network Externalities.** Some of MyCityGuide's features are subject to positive feedback. This fact raises strategic challenges which are presented and discussed in this chapter.

- **Chapter 9: Content Based Charging in the Internet.** This chapter discusses the separation between network and services in the internet and how that influences the value creation logic. Moreover, it explains why it is difficult for internet service providers (ISPs) to levy extra charges depending on the the type of service that run over their networks. This is a very important issue because an implementation of content based charging schemes could give

MyCityGuide much worse terms of living.

- **Chapter 10: Internal Analysis.** An internal analysis of CityMob is given in this chapter. A value configuration analysis is performed and CityMob's primary and support activities have been identified. Moreover, CityMob's strengths and weaknesses are pointed out.

- **Chapter 11: The Mobile Business Landscape.** This chapter presents the peculiar characteristics of the mobile business and categorises the large number of actors which exists in this value network. CityMob's place in the network and its required collaboration partners are given.

- **Chapter 12: Market Research.** In order to get an overview of the market, two market researches have been carried out. The first, was a survey seeking to discover the preferences of MyCityGuide's potential users. The second, was directed towards city magazines. Its goal was to identify possible collaboration partners. The outcomes of both researches are presented in this chapter.

Part 4: Results. This part consists of the results achieved during this Master thesis.

- **Chapter 13: Business Plan.** Based on the analysis and investigations which are presented in Part 3, a business plan for CityMob's operation is formulated. This business plan is meant to be a stand-alone document independent of other chapters. It therefore, to some degree, overlap with some sections from Part 3. Furthermore, it has its own appendix at the end of this chapter.

- **Chapter 14: MyCityGuide Prototype.** This chapter presents the prototype of MyCityGuide. Its design and features are based on the technology study given in Part 2, and the business investigations presented in Part 3. A demo-video and prototype souce code can be found in the external appendix.

- **Chapter 15: Pilot Customer - Munichx.** The city magazine Munichx was during the market research identified as CityMob's first choice for a customer. In May 2007, after developing the MyCityGuide prototype and after formulating the business plan, CityMob and Munichx agreed on a collaboration. This chapter outlines this process and the agreement.

Part 5: Prospect and Conclusion

- **Chapter 16: Items to be Resolved before Market Launch.** MyCityGuide will be launched in Munich on 22 September. This chapter states the status of the project and presents the work that needs to be done after the scope of this thesis.

- **Chapter 17: CityMob Framework and Execution Plan.** In order to deal with the shortcomings of the MyCityGuide prototype, a solution concept called CityMob Framework has been worked out. This framework is presented in this chapter along with an execution plan for CityMob.

- **Chapter 18: Conclusion.** This chapter summarises the important results of this Master thesis and concludes upon the work which has been done. Furthermore, the contributions from the main objectives, the prototype and the business plan, are identified.

Appendix This appendix can be found at the end of this report.

- **Appendix A: Prototype - Class Diagrams.** This appendix contains the entire class diagram for the remote server classes and the class diagram for MyCityGuide.

- **Appendix B: The Client - Class Diagrams.** The class diagram of the client side of the MyCityGuide prototype is shown in this appendix.

- **Appendix C: Proposal for SMS Payment.** In this appendix, the best price offer CityMob received on premium-SMS it will be shown and the following revenue sharing model with the 3rd part provider.

- **Appendix D: Project Plan for CityMob.** This appendix presents CityMob's expansion plan.

- **Appendix E: List of Potential Customers in Germany.** Through a market research, all city magazines in Germany, and thereby potential customers of CityMob, have been identified. An exhaustive list is given in this appendix.

- **Appendix F: Customer Collaboration Agreement.** A first draft of the agreement with pilot customer Munichx and CityMob is presented in its original form (German) in this appendix.

- **Appendix G: Team Collaboration Agreement.** The members of CityMob agreed in an early phase upon a set guidelines for our cooperation. This agreement is presented in its original form (Norwegian) in this appendix.

External Appendix. This appendix contains documentation which is either considered not suitable or to comprehensive to be included in the report. It is handed over to NTNU in the form of a ZIP-file.

- **CityMob Story.** The CityMob story is a video presentation of CityMob. It's

goal is to let viewers experience the CityMob's company culture.

- **Prototype Video.** In order to show the interactivity of the MyCityGuide prototype, a demo video has been made. The demo shows typical usage of the prototype. It includes commentaries in English.

- **Business Presentations.** During the work on this Master thesis, numerous presentations have been made. A selection is included here.

- **Prototype Source Code.** The prototype was implemented in J2ME. Because the source code is to comprehensive for the internal appendix, it is attached here. It includes documenting commentaries.

- **Corporate Design.** Corporate design is the official graphical design of the company used on letterheads, envelopes, forms, folders, brochures, presentation, web pages etc. The house style is created in such a way that all the elements are arranged in a distinguished design and pattern.

- **Market Potential Calculations.** In order to get an understanding of the market potential in Germany, calculations have been performed in Excel sheets. They can be found here. The text is in German.

This chapter gives a thorough explanation of the business idea which resulted in this thesis. The mobile information portal, which is to be developed, has been named MyCityGuide. This name is frequently used throughout this report.

The original service concept was somewhat modified in January 2007. The idea of only using content, which is going to be created by the company itself and supplemented by user inputs, was abandoned. The development of a community on web cooperating with a mobile community, was given a lower priority. Instead, it was considered more favourable to seek partnerships with established city magazines. City magazines exists both on the Internet and in printed magazines. This new strategy implies that MyCityGuide should be a portal for established city magazines. Moreover, additional services should be constructed in order to increase the value of the service.

In order to explain the value, which MyCityGuide offers its users, user scenarios are presented in Section 2.2. An important feature of the MyCityGuide service is its ability to act as an portal for several magazines. This scalability is explained in Section 2.3

2.1 MyCityGuide Concept

MyCityGuide is an application which can be downloaded and installed on mobile phones. It offers its users structured information regarding their respective city.

Moreover, users have the possibility to personalize the application in accordance to individual preferences. CityMob would like the information to cover:

- Restaurants, pubs, clubs, theatres, concerts, happy-hours, lounges, events, cinemas, happening and similar venues. All information relevant in order to make a decision regarding which establishment to visit, should be available. Examples are: Opening hours, category, prices, location and description.

- Users should have the possibility of ranking pubs, restaurants etc. The average rating should be visible to all users.

- Maps. Users should have the possibility to navigate on a map. This can be used in order to find points of interest, or the way from the current location and to the desired location.

- Public transport. Time schedules and information in regards to public transport should be incorporated.

- Automatic positioning. The application should be able to locate a user. This is frequently referred to as LBS (location based service).

- Community functions. Features such as a friend finder, instant messaging, virtual post-its and blackboard might be incorporated after a successful service launch.

- Context awareness. CityMob would like to MyCityGuide to be aware of the users' context. Location and time are the most interesting contexts.

This information should be quickly and easily available whenever and wherever. Modern life is full of surprises and it is hard to plan to every detail. MyCityGuide helps users make good and fast decisions whenever and wherever.

The application is going to be developed using the open source programming language Java. By using Java's micro version (J2ME), MyCityGuide will be able to run on most mobile phones in the mass-market.

2.2   Scenarios

MyCityGuide can be used for several purposes in many different situations. In order to show its usage diversity, a selection of scenarios is presented:

Usage Scenarios:

- Lisa and her friend are out partying, but now they want to move on to the next club. What places are close by? They start MyCityGuide and search for clubs in their vicinity using the location function.

- Thomas is very interested in theatre. He has personalised MyCityGuide so that it automatically receives information about Munich's theatres. While he is waiting for the bus, he checks this week's program.

- Rudolf and his friends are playing football. The guys decide that they want to go to a bar in the evening, but they don't know where. Rudolf picks up his mobile and starts MyCityGuide. The guys discuss a couple of the alternatives they get from a quick search, and make their decision.

- Heidi is bored and is lying on the sofa. She wants to quickly check the program of her favourite concert hall. By launching MyCityGuide she gets the information fast, and does not even have to leave the sofa.

- Friedrich is an active user of MyCityGuide. This weekend he wants to go to Berlin. Luckily, CityMob has a deal with a city magazine there, so Friedrich just switches from Munich to Berlin and checks out the main events.

- After finding a good restaurant using MyCityGuide, Sandra just presses the telephone-link in the information field and reserves a table.

- Karin is very interested in food. After going to a restaurant, she enjoys telling her friends about it. She is, therefore, very fond of the polling option on the MyCityGuide. With it she can contribute to the ranking of Munich's restaurants, and also find out how other restaurants are ranked.

- To find the theatre, Bummi uses the maps offered on MyCityGuide.

2.3   Scalability

CityMob is not restricted to only one city magazine. CityMob will have a network of customers which will all use the same version of MyCityGuide. The different customers can, however, customize MyCityGuide to some degree. That is, they can add their personal touch (e.g. logo, background colour, advertisements). The main characteristics of MyCityGuide remain the same for each customer. In this way, MyCityGuide can be thought of as a portal solution, which CityMob can offer to different city magazines.

CityMob seeks to get customers whose geographical coverage does not overlap. For example, a city magazine in Berlin is not competing for the same market as a city

magazine in Munich, and they can, therefore, both gain advantage by using MyCityGuide. It is also imaginable that two city magazines can compete for different markets within the same city. For example, one can be directed toward young people and therefore provide information about clubs and night-life, while the other is more focused on restaurants and theatres.

The scalability is an essential quality both for CityMob and for the end users. For CityMob, it dramatically increases the number of reachable users and the number of potential customers. For the end users the result is a product which works in more than one city. MyCityGuide can therefore be used as a source of information in every city where CityMob has a collaboration city magazine. For instance, if one usually uses MyCityGuide in Munich but travels to Berlin for the weekend, one can easily change from Munich to Berlin within MyCityGuide. If this change implies getting information from another city magazine, it will be mostly transparent for the user. Only the city magazine's logo, advertisements, and possibly the background, will change change.

Background and Context

This project started on scratch in January 2007. It's aim is to design, implement and launch a commercial city information guide for mobile phones. Two thesis has been formulated from this project. As described in Chapter 1, they have different objectives. Nevertheless, some parts overlap.

This chapter seeks to clarify the background and context which has led to the formulation of these two Master thesis.

3.1   Project Background

Petter Johannessen device the idea late autumn 2006. He was then writing his depth study on the topic of application development for mobile phones. The study was carried out while he was working for Brand New World (BNW). BNW is a Munich-based company which develops games and services for mobile phones. The concept was introduced to Jan Sindre Isene in December 2006. A meeting with an incubator in Trondheim, called Innovasjonssenter Gløshaugen, was arranged. After receiving positive feedback from their leader, Bjørn Inge Haugan, Isene and Johannessen decided to try to commercialise the idea.

Johannessen had valuable connections through his work at BNW in Munich, and an incubator-senter related to the Technische Universität München promised valuable assistance. Because of this, Munich was chosen as the location for this venture. Furthermore, is was considered that the idea is only valuable in populous cities.

Therefore, Munich's 1,3 million and Germany's 82 million inhabitants, have clear advantages over the market in Norway.

The project is of a considerable size and Johannessen and Isene realised that more manpower was needed in order to achieve the needed progress within the time horizon of their Master thesis. Because there were no funds available for paying salaries, the recruiting process was focused on technology students who were about to write their Master thesis. In early January 2007, Håkon Abrahamsen and Aksel Lefebure joined the project.

3.2 Project Context

This section explains the project's location, the team members and the founding of CityMob. Furthermore, CityMob's incubator, UnternehmerTUM, is presented.

3.2.1 Munich

The project setting is in Munich, which has 1,3 million inhabitants and is thereby the third biggest city in Germany . It has the strongest economy of all the cities of Germany, and is considered to be a centre for German software industry. Two of Germany's three elite-universities are located in Munich. Abrahamsen, Johannessen and Isene all attended an Erasmus-exchange program in their 7th and 8th semester at one of them, namely *die Technische Universität München* (TUM). The program resulted in that the three of the team members have adequate skills in the German language and also knowledge about the city.

3.2.2 Founding CityMob

Since MyCityGuide is a commercial idea, the founding of a company was considered in an early phase. In Germany, a verbal agreement between team members is sufficient to found a GbR (Gesellschaft Bürgerlichen Rechts). CityMob was therefore founded as a GbR in February 2007. A GbR means that everyone in the company is personal responsible for the company, hence an unincorporated firm. The web page (www.citymob.eu), was launched in connection to the company founding.

3.2.3 UnternehmerTUM

UnternehmerTUM GmbH is the centre of entrepreneurship at the Technical University of München. It is a non-profit company committed to develop

entreprenerial business skills of students and support start-ups.

UnternehmerTUM was contacted previous to the project start. CityMob was permitted to use the innovation lab as work space, and was also offered to use the play.Tools framework. The play.Tools framework, which is presented in Chapter 7, for mobile applications had newly been finished, and we were the first students to utilize it in a project. A Database and a server were also offered for the development phase. Throughout the project, UnternehmerTUM gave business, legal and technical advice through several of their employees.

3.2.4 The Team

The main team of four was formed soon after, Jan Sindre Isene, Petter Johannessen, Axel Lefebure and Håkon Weum Abrahamsen. Jan Sindre Isene like Petter Johannessen has their background from the Institute for Telematics at NTNU, specializing in ICT economics. Håkon Weum Abrahamsen has studied at the same institute, but has specialised in Access and Core Networks. Axel Lefebure studied at Department of Computer and Information Science and has specialised in Programs and Information Systems. These four members started working at the end of January.

An agreement, which states guidelines for the project collaboration, was formulated and signed by all the team members in an early phase. This agreement can be found in Appendix G.

Part II

Technology Background

CHAPTER 4

Java Micro Edition

Java was chosen as the programming language for the development of the client side of the MyCityGuide prototype. The mobile application development framework, play.Tools, which is described in Chapter 7, has also been utilized. Both these technologies is likely to be used also in future versions of MyCityGuide. The prototype, which was developed during this Master thesis, is described in Chapter 14.

In order to use the Java Virtual Machine (JVM) for mobile devices as cell phones and PDAs, the Java 2 Micro Edition (J2ME) library is needed. This development library provides a reduced version of the Java 2 standard. The reason for such a version is the limited storage room, processing power and smaller displays of the target devices. Some functions of the standard edition could be too demanding for mobile devices, or not necessary [62]. See the complementing Master thesis [1], for a comparison between J2ME and the Wireless Application Protocol (WAP).

The J2ME platform delivers the power and benefits of Java technology, and includes a broad range of built-in network protocols. The platform is deployed on millions of mobile devices and is supported by leading electronics vendors and companies all over the world. This chapter gives an overview of the J2ME technology.

Section 4.1 presents the J2ME architecture and software stack which consists of 3 layers. These layers are the virtual machine, configurations and profiles and are explained in belonging subsections. Section 4.2 explains how user interfaces for mobile devices are built. Section 4.3 presents the record management store which is

the only way of accessing persistent storage on most mobile devices.

4.1 J2ME Architecture

Since J2ME is meant to work on a lot of different devices, it comprises a variety of optional packages that can be added and used to construct a runtime environment that fits the requirements of the target devices or market. Such optional packages can for example add support for database connectivity, Bluetooth, wireless messaging, or web services. Packages are modular and developers can therefore include only those packages necessary for the application [62].

In order to support the flexibility which is needed because of rapid changes in devices and customer needs, the J2ME architecture is divided into three software layers built upon the host operating system (OS) [60]. The layer stack is shown in Figure 4.1. An application developers choice in each of the layers determine which devices that can run the application.
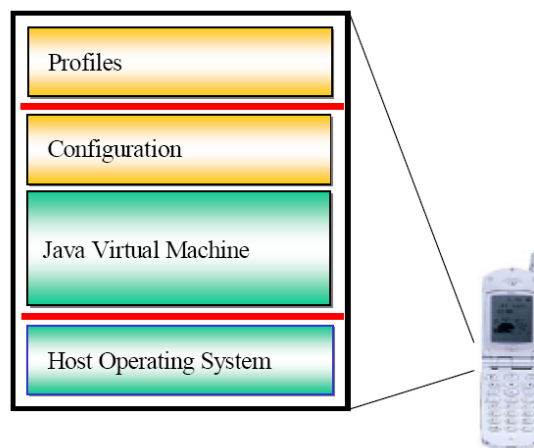
Figure 4.1: J2ME software layer stack [60]

4.1.1 Kilobyte Virtual Machine

A Java Virtual Machine (JVM), is a virtual machine which interprets and executes Java byte code. The JVM that supports small devices with limited memory and processing power, is called the Kilobyte Virtual Machine (KVM). The KVM got its name because it includes such a small subset of the J2SE JVM that it runs in kilobytes of memory instead of megabytes [60].

Mobile phones come with different operating systems. Therefore the actual role of

KVM in target devices can vary significantly. For devices with a user interface capable of running native applications the KVM can be configured to run in that fashion. For devices without such a user interface, KVM provides the Java Application Manager (JAM). JAM will then serve as an interface between the host operating system and the virtual machine [60].

4.1.2 Configurations

A configuration defines the minimum set of JVM features and Java class libraries available on a particular category of devices [60]. The device categories represents vertical market segments and they differ in processing power and memory. See Figure 4.2 for a coarse overview over marked segments.

Currently there are two base configurations for J2ME, Connected Device Configuration (CDC) and Connected Limited Device Configuration (CLDC). CLDC is the smaller of the configurations and is targeted toward less powerful devices such as mobile phones smart-phones and PDAs. Requirements for devices using CLDC are 16-bit CPUs and of 160 KB available to the Java Platform [60]. CLDC does not define device-specific functionality in any way, but instead defines the basic Java libraries and and functionality available from the KVM. KVM and CLDC are closely related. CLDC runs on top of KVM and the CLDC is the only configuration supported by KVM [60].

CDC is a superset of CLDC includes a full-featured Java Virtual Machine. It is targeted toward more capable devices as car navigation systems and set-top boxes and requires 32-bit CPU and 2MB memory available to the Java Platform [60]. Even though some recent high-end smart-phones and PDAs support CDC (i.e Sony Ericsson's P900 and M600), such devices is not a target group for MyCityGuide which is the mass-marked. Therefore CLDC is the chosen configuration and CDC will not be explained further in this chapter.

CLDC is available in two versions, a 1.0 and a 1.1. The differences are bug fixes and the fact that the newest version supports floating point arithmetic. Specifications, APIs and other CLDC-related information are available at Sun Microsystems' CLDC product website [56].

4.1.3 Profile

A profile is a contract between an application and a J2ME vertical market segment. All the features defined in the profile can be implemented in all the devices in the market segment, and the application can use only the features defined in the profile
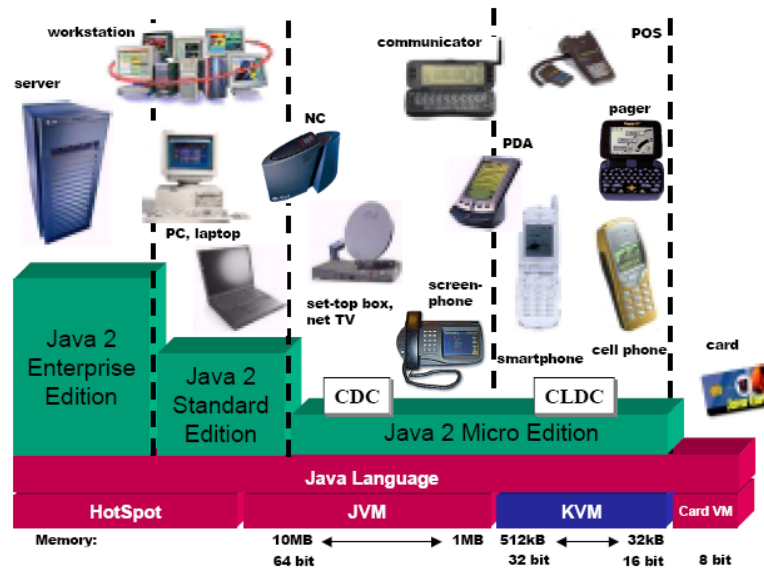
Figure 4.2: Target market for each Java-edition [60].

[60]. This agreement ensures portability between the application and the devices served by that profile. At the implementation level, a profile is defined as a collection of Java APIs and class libraries that reside on top of a specified configuration [60]. Profile implementers must design their code to stay within the bounds of the Java virtual machine features and APIs specified by that configuration.

It is possible for a single device to support several profiles. Applications are however written for a specific profile and are required to use only the features defined by that profile [60].

4.1.4 Mobile Information Device Profile

The only profile currently developed for the CLDC configuration is the Mobile Information Device Profile (MIDP). To versions of the MIDP exists in the time of writing, MIDP 1.0 and MIDP 2.0. However, all phones in CityMobs target group (phones younger than 4-5 years) support MIDP 2.0 and only this version is discussed further. A list of which mobile phone models support different profiles and configuration can be found at [36].

MIDP is designed for mobile phones and entry-level PDAs. It offers core application functionality required by mobile applications. This includes API classes related to interface, persistence storage, networking, and application management. Together with the CLDC, MIDP provides a complete J2ME runtime environment [45].

MIDP applications are called MIDlets. MIDlets are available through MIDlet suites which consist of two files, a Java ARchive (JAR) file and a Java Application Description (JAD) file. The JAR file contains compiled classes and preverified format. The JAD file describes the MIDlet which is distributed as a JAR file.

MIDlets can be transferred from a PC to a mobile device from using Bluetooth or a cable connection. However, the most common way of obtaining MIDlets are over-the-air provisioning (OTA). This is when a mobile device connects to the internet and downloads the MIDlet from a web server. This is done by simply entering the URL of the desired MIDlet's JAD-file in a HTTP or WAP browser.

4.2   User Interface Levels

A core feature of the MIDP technology is its support for developing mobile phone user interfaces. The MIDP provides a set of Java APIs known as the LCDUI (Liquid Crystal Display User Interface), which has functionalities similar to the Java Abstract Windows Toolkit (AWT) and Swing APIs in the desktop world.

LCDUI has two user-interface levels which satisfy the needs of different developers: The high-level API and a low-level. This section explaines the main differences between them. The interested reader should consult the MIDP API [59] for details.

4.2.1   High-Level APIs

High-level APIs contain a basic set of UI (User Interface) components for building mobile applications. These high-level API components make applications simpler and more portable and have the following properties: Drawing to the display is performed by the device's system software. Applications do not define the visual appearance (e.g., colors, fonts, etc.) of the components. Thus, applications are automatically using the native look and feel of the device the application is running on [70].

The high-level API is suitable for business applications, which do not differentiate themselves through UI innovations. Such applications offer a "no-surprise" UI to users and have minimal learning curves. Their value comes from the content and functionalities behind the user interface.

By using the high-level API the developers does not have much over the drawing details and cannot go beyond the predefined set of components. The supported components are shown in Figure 4.3.
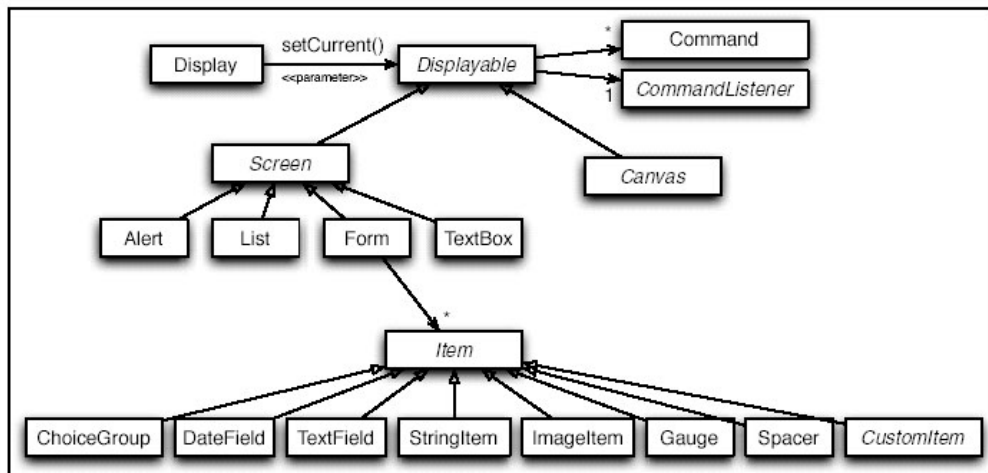
Figure 4.3: Important classes and interfaces of the MIDP UI.

4.2.2 Low-Level APIs

The low-level API gives developers complete control of the entire device display, including drawing on any pixel, rendering basic shapes, and drawing text with specific fonts. The low-level API also supports richer user interactions by providing mechanisms for developers to handle all keypad key events and pointer movements. The high-level API only supports soft-key events [70].

A low-level UI application needs to render itself rather than delegate the task to the runtime library. Hence, low-level API applications usually require much more code than the high-level ones. Porting low-level UI applications to different devices is not trivial task. Not only is it hard to implement a native look-and-feel text input box using pixel-level tools, but many versions would typically have to be made in order for a MIDlet to run on many different phones. These factors significantly increase development time. Program testing on every phones in the MIDlet's target group have to be carried out.

It is possible to use both high-level API components and low-level API components within the same application.

4.3 J2ME Record Management Store

Each record store can be visualized as a collection of records, which will remain persistent across multiple invocations of the MIDlet. A record is an individual data item. RMS places no restrictions on what goes into a record: a record can contain anything that can be represented by a sequence of bytes. It is up to the developer to
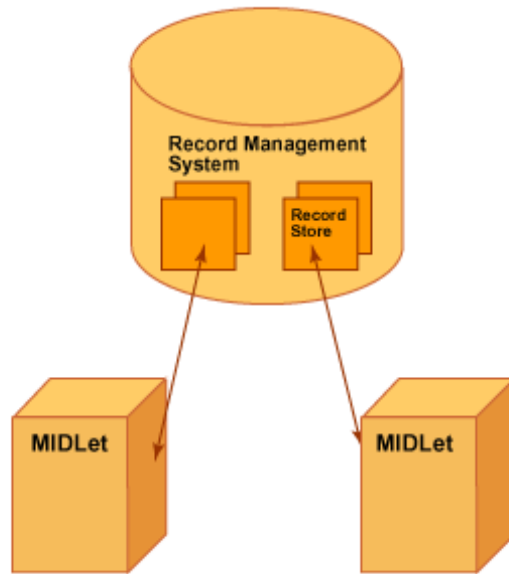
Figure 4.4: Overview of J2ME RMS and MIDlet interfacing

create the binary encoding and decoding of the application data. RMS only provides the storage and an unique identifier. If multiple threads are being used to access the RMS it is up to the application to perform coordination [44].

The amount of memory available for record-based data storage varies from device to device. However, the MIDP specification requires devices to reserve at least 8 KB of non-volatile memory for persistent data storage. A MIDlet suite which uses RMS should specify the minimum number of bytes of data storage it requires in the JAD file. Since a device might refuse to install an application if it requires more space than available, the requirement should be set to a minimum. Exceeding the requested space is allowed by most devices [44].

4.4   CityMob Usage

CityMob has build the MyCityGuide prototype in J2ME and will also develop the final version using this programming language. The low-level API, Canvas, was used to program the user interface. Canvas gave control of the the look down to the very pixel. One of the main contributions from the prototype was demonstration in order to attract collaboration with city magazines. The design was therefore prioritized and the prototype was implemented to work flawless on a Nokia N70.

Because device portability was not emphasised in the prototype, multiple errors have been observed when it has been tested on other devices. When building the final

version of the application, portability is of highest importance.

Use of the record management store (RMS) was not implemented in the prototype. However, it will be very important in the final version of MyCityGuide in order to allow for personalisation and off-line functionality.

Mobile Access Networks

MyCityGuide acts as a portal providing city information to mobile phone users. Most of this information will not be available without communications with CityMob's server. This communication requires that the users' mobile phones are able to access the internet. The different access networks differ in bandwidth, diffusion and usage cost.

This chapter presents the internet access networks which are available to mobile phone users in Europe. The cellular networks, GSM and 3G (UMTS) along with their enhancements, are presented in Section 5.1 and Section 5.2. Section 5.3 presents the increasing use mobile phones make of wireless Internet hotspots.

5.1 GSM

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services. GSM is called a second generation mobile system (2G). GSM differs from the first generation wireless systems by using digital technology and time division multiple access transmission (TDMA) methods. It was one of the first digital mobile networks developed that was developed and has become a widely adopted standard across the whole world.

GSM supports data transfer speeds of up to 9.6 kbit/s, allowing the transmission of basic data services such as SMS (Short Message Service). A major benefit is its international roaming capability, allowing users to access the same services when

travelling abroad as at home. This gives consumers seamless, and same number connectivity, in more than 210 countries. GSM satellite roaming has also extended service access to areas where terrestrial coverage is not available [30].

GSM operates in the 900MHz and 1.8GHz bands in Europe and the 1.9GHz and 850MHz bands in the USA. The 850MHz band is also used for GSM and 3GSM in Australia, Canada and many South American countries The GSM standard uses TDMA (Time Division Multiple Access), which is a narrow band solution [30]. The radio-interface is divided into frequency channels and each channel is divided into time slots providing eight channels per radio frequency channel. The GSM standard has been continuously developed, and new enhancements have been added. Among them improvements for providing better data-rate capabilities. They are presented in the following subsections.

Users are currently migration from GSM, which is a 2G technology, to 3G networks.

5.1.1   GPRS

GPRS (General Packet Radio Service) is the world's most ubiquitous wireless data service, available now in almost every GSM network. GPRS was developed to provide packet-switched data service to the existing GSM network. GPRS is more efficient for data transmission than the circuit switched GSM because it utilizes the network capacity better by dynamically sharing available bandwidth between multiple users. This packet-oriented scheme leads to a big difference for the customers. In contrast to the circuit-switched connections, where one must pay on a per-minute basis, using GPRS one only pay for the transmitted data amount. This always-on functionality makes mobile-services more attractive for the users since the applications which are designed for GPRS, often use low network traffic.

With GPRS's throughput rate of up to 40 kbit/s, users have a similar access speed to a dial-up modem, but with the convenience of being able to connect from anywhere. Most GSM terminals sold today, support GPRS [30].

In busy areas/cells GPRS users can experience a poor throughput due to fact that the circuit switched services are given a higher priority in GSM networks [18].

5.1.2   EDGE

Enhanced Data rates for GSM/Global Evolution, also called EGPRS (Enhanced GPRS), is an enhancement to GPRS, thus a part of the GSM standard, providing

better data rates. EDGE is basically an upgrade of the GPRS service, i.e. an upgrade to the air interface between the terminal and the network. Using EDGE, operators can handle three times more subscribers than GPRS; triple their data rate per subscriber, or add extra capacity to their voice communications [46].

Although EDGE requires no hardware or software changes in the GSM core networks, base stations must be modified. EDGE compatible transceiver units must be installed and the base station subsystem (BSS) needs to be upgraded to support EDGE. The Global mobile Suppliers Association [46] states that in November 2006, there were 156 commercial GSM/EDGE networks in 92 countries, out of a total of 213 GSM/EDGE deployments in 118 countries.

5.2 3G

Universal Mobile Telecommunications System (UMTS) is envisioned as the successor to GSM. UMTS is one of five candidates specified by IMT-2000 (International Mobile Telecommunications-2000 as a global standard for third generation (3G) wireless communication, defined by the International Telecommunication Union (ITU) [64].

UMTS was developed with the aim to succeed GSM and uses much of the same components. This is done in order to enable easy handover between the two networks in areas where one of the networks suffer from poor coverage. Handover is important in order to ensure continuity of service. Especially GSM-UMTS is important since GSM provides a nearly ubiquitous coverage in many countries while UMTS access is somewhere more limited.

UMTS supports up to 1920 kbit/s transfer rates. In real networks, however, users can expect a performance of up to 384 kbit/s [69].

An enhancement to UMTS is the High Speed Downlink Packet Access (HSPDA). HSPDA is an upgrade to the UMTS radio interface, which can deliver a three fold increase in sectors and a 6x increase in user throughput. HSDPA can deliver speeds up to 14 Mb/s [69].

5.3 Wi-Fi

A wireless LAN (Local Area Network) denotes the linking of two or more computers without wires. The WLAN standard 802.11x is denoted Wi-fi. The common use of

the term Wi-fi has broadened to describe the generic wireless interface of mobile computing device.

An increasing number of mobile phones are "dual-mode phones", i.e. they can be used to access both cellular networks and WiFi-connections when located in a Wi-Fi hotspot. Hotspots are venues that offer Wi-Fi-access. Many hotspots offer internet access free of charge. Hotspots are easy to install. All that is needed is an internet connection and a wireless router. The available bandwidth of a router is shared by all the users which are connected.

Hotspots can often be found at restaurants, train stations, airports, coffee-shops and libraries. They are becoming increasingly common and can be seen as a threat to cellular networks. Wi-Fi phones can be equipped with VoIP-programs and thereby call for free. As discussed in Chapter 9, internet service providers (ISPs) cannot charge for such use.

Since WiFi-hotspots offer reasonable data rates, and are often free of charge, they are a positive driver of mobile service usage. Some big cities (e.g. San Francisco, New York) are even beginning to get ubiquitous wireless Internet access.

User Positioning

Location information is becoming an integral part of different mobile services. Knowing the position of the mobile phone user is an important context for many services. It adds an element of personalisation. CityMob would like MyCityGuide to be location aware. However, how this should be done is not a trivial question. Different methods are available. The all have both advantages and disadvantages.

The value of the location information depends on how exact and how current the position is. The ideal situation would be to know the exact position of every user at all times. This is unfortunately not possible yet. Almost exact position could be provided by GPS. Some recent mobile phones have built-in GPS but it is not yet common.

This chapter explains the different methods of locating a mobile device. These methods differ in characteristics such as handling, exactness, technical request and costs. One way of obtaining knowledge of users position is to ask him/her to input it themselves. Manual input is discussed in Section 6.1. Typing on a mobile phone can be a cumbersome task, and a more elegant solution from the users' point of view is that the application automatically knowing the location of the terminal. There are different ways of doing this. Automatic positioning in GSM networks are discussed in Section 6.2. Positioning in W-LAN cells and the use of GPS are presented in sections 6.3 and 6.4 respectively. Section 6.5 sums up the chapter and discusses CityMob's use of positioning technologies.

6.1   Manual Input

From the services' point of view, the simplest user location method is to let the user tell the service where he/she is located. This can be done by typing in an address or a location known to the system. It could also be pointed out on a map. The only costs are the connection charges for transferring the position data to the system. Manual input information can be provided in different granularities:

1. Area format, e.g town district or municipal area. If the area is not too big this could be exact enough for services such as, for instance, finding a restaurant, event or cheap hotel nearby. If a town has a reasonable low number of areas, this could be chosen in a list by the user and by doing so avoids cumbersome typing.

2. Exact position through address input: A user can type in street name and number. This provides a fairly exact position, but it requires that the user know the address (or it is easy available on a house nearby) and user typing.

3. Position input through a map: The application can provide a map for the user where he/she can control a marker to his/hers current position. Exactness depends on the implementation.

4. Exact position input in geographical format: The user here needs to know and enter geographical coordinates (length and with). This is exact information, but needs to be received from positioning systems like GPS.

As typing on a mobile device can be seen as a cumbersome task, manual input from the user should not be overdone in an application. Manual input also requires that the user already has some information regarding where he/she is.

6.2   Positioning in GSM Networks

The GSM network, described in Chapter 5.1, provides means of locating mobile phones. This is being used by the network to make decisions on when to hand over a connection from one cell to the next. Long-term monitoring of positions provides excellent input to the planning of the cellular network.

This positioning has also been used by some telecom providers to offer Location-sensitive billing where users have cheaper tariffs within a "home-zone area".

Terminal position is calculated by using the position relative to the surrounding base stations. Information about the base stations locations is needed in order to

translated the relative position to a geographical position. There are several methods known. These methods can be used in both network based positioning and in terminal based positioning. For more information on positioning in GSM see [21].

This section continues by explaining the network based positioning and the terminal based positioning.

6.2.1 Network Based Positioning

Network based positioning is the most common method for location-based services in mobile phone networks [43]. The mobile networks include a location server. Third party services can query position information from the server, and get the position data back in geographical format. This information can then be used in order to provide location-based services.

This method requires a service whose provider has collaboration agreements with the users' telecom operators. In Germany these are 02, E-plus, Vodafone, T-mobile. In the German marked, companies specialising in providing Location Content Services (LCS) services have appeared. They function as mediators between the telecom operators and the LBS service providers. A service provider does therefore only need one agreement. This simplification comes at a higher cost. The costs from a LCS (location content service) provider are presented in Figure 11.6 in Chapter 11.

6.2.2 Terminal Based Positioning

In order to implement terminal based positioning a logical unit in the mobile terminal is needed. This logical unit would have to provide information such as CellID of current cell, signal strength, or surrounding cells. This information can then be sent to a location server (belonging to the service provider) where a big database with the base stations' positions exist. The server can then calculate the position of the terminal which again could be used in order to provide a location based service.

This scheme has some problems. First of all, to be able to access information like CellID one need an application written in the phones's native language. That means, Java 2 Micro Edition (J2ME) could not be used. Almost every phone type would need a specific written application which would imply a drastic increase in development work. Secondly, one would need to know all the base stations' position. This would not only imply a big database (for a nationwide service), but the mobile network operators are also reluctant to release this information [43].

6.3 W-LAN Positioning

Most newer smartphones come equipped with possibilities to connect to Wireless Local Area Network (W-LAN) hotspots. These hotspots can be found many places in cities, e.g. cafés, shopping centres and similar. The user device can then be positioned to be within that W-LAN area. The location exactness depends on the density of access points, but can be down to two meters [38]. However, the hotspot density is not very high in many city and many hotspots are neither free of charge.

6.4 GPS

Global Positioning System (GPS) is the most popular radio navigation aid because of its high exactness, worldwide availability, and low cost. It was developed for military use by the United States Department of Defence but can now be used free of charge for commercial applications. Location can be determined to a few meters. GPS is based on satellite communications and at least three satellites must be visible to the GPS receiver. Thus GPS is not suitable in a densely populated urban area with a lot of high buildings and a limited view to the sky. GPS can neither be used indoors [68]. However, upcoming version of GPS are said to be functional indoors.

Because of the importance of location in emergency situations, it has, in several developed countries, been suggested that GPS should become a standard on mobile phones. Recent high-end mobile phones in Europe are also equipped with GPS. But it will most likely take some time before GPS has penetrated the mass marked. A drawback with GPS is that the standby function is battery consuming.

6.5 Summary and Discussion

This chapter has presented how a mobile terminal can be located in order to provide LBS services. Manual input can be cumbersome for the users, yielding a need for automatic positioning for some services. GPS has worldwide coverage and high exactness, but has drawback in urban areas and has neither yet penetrated the mobile mass marked. GSM positioning methods work better in cities because of a higher cell density. GSM also works inside buildings. The main drawbacks of GSM positioning are the costs per query to the LBS-server and the calculation delay.

The MyCityGuide prototype uses GPS for its map function and manual input for the search functions. When searching, users have the possibility to enter city district by choosing from a list. This selection is necessary if users want to search in a specific city district and when they are not located in this district. However,

CityMob seeks to implement GSM network positioning (complemented with GPS on enabled phones) which automatically locates users in order to provide a function which searches and ranks POIs (points of interest) based on position. This automatic positioning can also be used for route planning and the map function. A friend finder service and other community services will also rely on positioning.

GPS, with all its advantages, is the favoured technology for automatic positioning in the future. But as long as it does not work adequate in urban areas and is not usual on CityMob's target device market, CityMob seeks to implement GSM network positioning. The major challenge will be covering the costs per request charged by the LCS mediators. This cost needs to be compared to the value this feature adds to MyCityGuide. The LCS mediating companies which CityMob has been in contact with are Dialogs and Mecomo [42]. The German telecom operators only provide LCS through these two and possibly a few more similar companies.

In the same way as GPS is still a new feature, support for W-LAN is only found on high-end mobile phones. Using W-LAN positioning is therefore something which might be considered in the future.

CHAPTER 7

The play.Tools Framework

The play.Tools is a client-server framework that permits fast and easy development of mobile applications. It has been used in order to develop the MyCityGuide prototype, which is presented in Chapter 14, and it most likely be used in the development of the finished product. play.Tools provides the developer with predefined facilities such as map functions and web services. The play.Tools framework has been an important resource and we will in this chapter look into the details of it.

This chapter begins by presenting the objectives which the framework fulfils in Section 7.1. Moreover, the server and client parts of the framework is detailed in Section 7.2, and Section 7.3 respectively.

7.1 Objectives

Behind the name play.Tools you will find a framework from UnternehmerTUM GmbH, made for the development of prototypes for mobile devices, thereby contributing to the innovation process. The framework offers a set of generic, re-usable standard components. The goal of this framework is to help student developer teams in the development of prototypes for mobile phones. The framework is offered to lower the barriers of the development of context sensitive applications.

The play.Tools framework is made for a series of different mobile end devices. It offers a certain amount of functionality that even simple end devices can handle. In addition a central server system is offered that can handle the ever more important

functionality of securing important data, databases, personal information and similar.

7.2   Server-Framework

The server component is a J2EE application running on a application server like Apache Tomcat and Sun application server. The basis of the play.Tool-Server is Spring, a Java/J2EE framework based on the principles referred to by Rod Johnson in the book "Expert One-On-One J2EE Design and Development" [37], that can run on different application servers. The main principle of Spring is Inversion of Control or as it also is called, the "Hollywood principle" ("Don't call us, we call you."). The principle basically says that instead of the application controlling the logic, the control is handed over to several smaller programmes in the framework. This principle says that objects are not to search for resources, but are rather sent references. The core of the Spring framework is the Bean-Factory making it possible for objects to be called by their name. The Bean-Factory also coordinates the relationship between objects.

Each server component is configured, initialized and combined in the XML-Bean-Definitiondata, which is read by Spring during start-up. The play.Tools-Server is called "PlayBox", and also offers option of object persistence: Objects are mapped by the open source framework for persistence called Hibernate, and saved in a MYSQL data server. The server components offer some functionality:

- Handling of users
- Handling of context information
- Handling of applications
- Providing context based maps
- Providing points of interest information

These services can be accessed by web service. Also included in the framework is a hybrid recommender system, allowing users to recommend for other users with similar profile, a system for the generating of high level context, a system for the handling of context and profile information and a system for the syndication of context and profile information.

7.3   Client Framework

The client components are based on the J2ME technology and their additional components needed. This includes in addition to MIDP also several JSR's, like JSR

82 (Java APIs for Bluetooth) or JSR 120 (Wireless Messaging API). The architecture is based on the following logic: There are several independent components, each with their own functionality. These components run logically isolated from the rest of the system. The only thing important is what information is available from the outside. It can be said that each component consists of a certain amount of classes, but the component itself is only reachable by promoting information from the outside. The life cycle and access of the components is the responsibility of the *ComponentContainer*. It allows the access on the components, and initializes and ends components.

Like in Spring the play.Tools client framework has a properties document in XML. *ComponentContainer* reads this document at start up. Figure 7.1 shows a the main architecture of the play.Tools client framework. For simplicity, not all components shown. The *ComponentContainer* is started in a MIDlet so that it can run in the J2ME runtime environment. Each component offers a certain functionality.

- playtoolsBluetooth - Finds and connects to Bluetooth devices
- playtoolsContent - Records and sends context information to server
- playtoolsGPS - Reads and sends GPS coordinates to the server
- playtoolsMap - Displays the map on the device
- playtoolsMessaging - Handels the writing and sending of SMSs
- playtoolsPIM - Making contacts and calenders available for the application
- playtoolsServer - Communication with PlayBox-Web-Services

The current version of play.Tools, which have been used to develop the prototype developed in this chapter, can be considered to be open source. It has no restrictions on usage. It is, however, not distributed in any way. The next version of play.Tools, which is currently being developed, will have restrictions on commercial use.
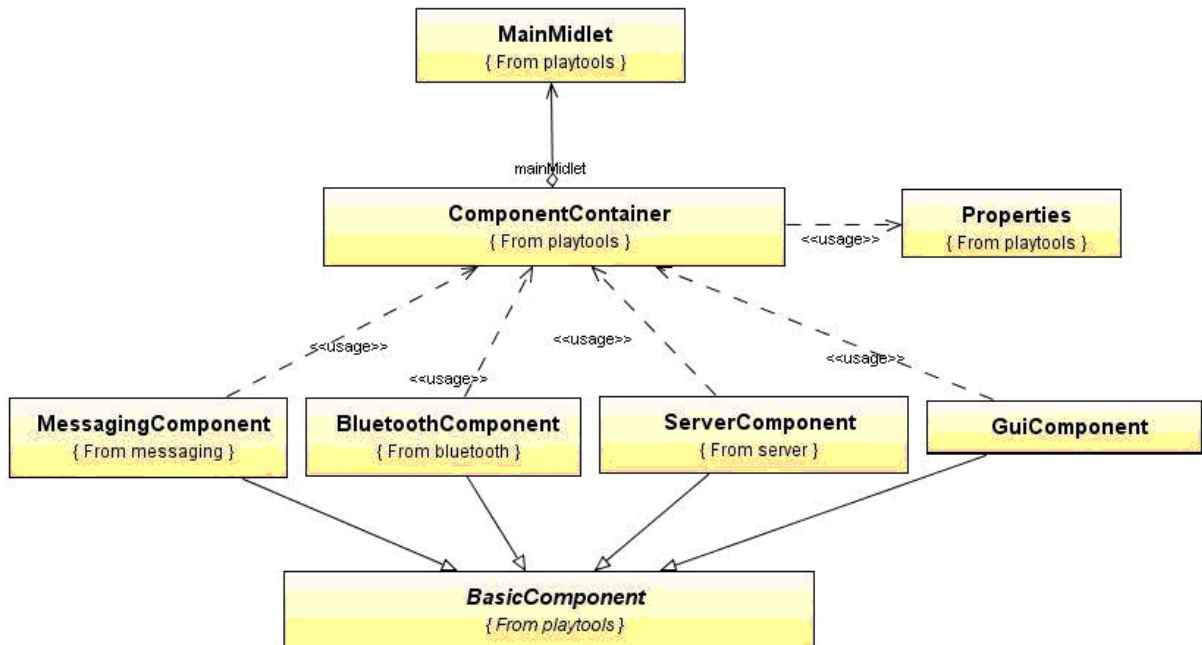
Figure 7.1: Client architecture

Part III

Business Plan Prestudy

CHAPTER 8

Network Externalities

The theory in this chapter is based on a paper by professor Jan Arild Audestad called "Positive feedback from the market: network externalities" [7]. Audestad describes dynamic models for markets both subject to, and not subject to, positive feedback. This chapter explains the difference between the two models, and outlines the important implications positive feedbacks have on markets. CityMob's considerations in this context are presented. The deduction of the models in mathematical form, can be found in [7]

Dynamic models are concerned with how a system evolves as a function of time. They therefore differ from standard economic models which only determine stable outcomes of competition by using intersection points between curves.

Section 8.1 explains the term feedback and how that affects system output. In Section 8.2 network effects and how they affect market behavior are outlined. Models of markets both subject to and not subject to externalities are presented. These models only aim to describe the basic behavior of such markets and by not all the market development drivers. Section 8.4 explains how CityMob plans to overcome the addressed obstacles and exploit the advantages of positive feedback.

For a thorough guide to the behaviour of the markets of the new information technology see the book [14] from Shapiro and Varian.

8.1 Feedback

Feedback is the process in which part of the output of a system is returned to its input in order to regulate its further output. This section is only concerned with economical systems, but feedback applies to many systems, e.g. technical, social, biologic and etc. In economic systems the output signal can for example be price or marked share. Feedback can be both positive or negative. In cases of positive feedback the system response is amplified, whereas in cases of negative feedback the system response is dampened.

If a output signal increases, positive feedback forces it to increase further, but if it decreases, positive feedback causes it to decrease further. Negative feedback would dampen an increase in signal output, but also dampen a decrease in the signal output. Thus negative feedback forces the output signal toward its equilibrium value and results in stationary systems. Positive feedback, however, can result in saturation (i.e. the output signal approaches a fixed limit) or oscillation between given values. See the paper by Bryan Arthur[4] for a discussion of positive feedback in the economy.

8.2 Network Externalities

In markets with positive feedback the perceived attractiveness of a product to a customer depend on the number customers that have already purchased the product. Typical examples can be found in the telecommunications industry. Clearly, nobody wants a telephone if there is nobody to call to. The more people connected the more attractive is the service. The same applies to fax machines, peer-to-peer programs, etc. The expected number of future customers are also affects the value of the product.

When positive feedback is caused by a formal or informal network among the customers/users it is often called network externalities or network effects. Metcalfe's law states that the total value of a good or service that possesses a network effect is roughly proportional to the square of the number of customers already owning that good or using that service. Thus, if N is the number of members, the network value is N(N - 1) because every member can interconnect with the N - 1 other members. Reeds law, however, boldly claims that the value is 2^N because this is the number of groups that can be established. Formation of groups can to a big degree be seen in on-line communities. These are websites that offer a context for people to meet, communicate and collaborate.
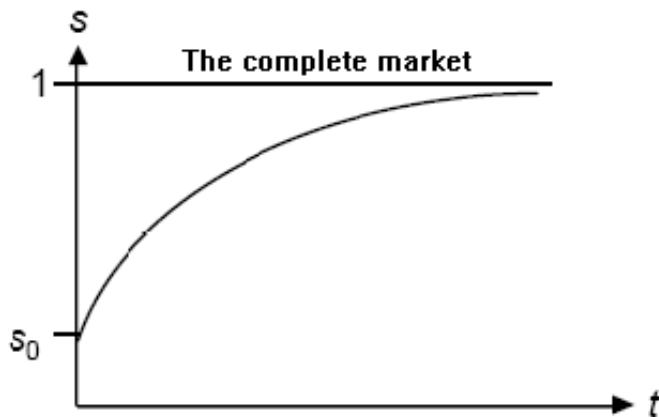
Figure 8.1: Behaviour of a market without feedback. The curve represents the relative share of the market having purchased the product as a function of time, s(t).

8.3 Market with Positive Feedback

Markets with positive feedback have certain properties that differ from other markets. Figure 8.1 shows the behavior in a market without feedback. For simplicity, the model assumes that only one firm exist in this market. Observe that the market starts growing without the presence of initial customers (S(0)=0). This property does not exist in markets with positive feedback.

Figure 8.2 illustrates the basic behaviour in a market with positive feedback. In order to demonstrate the basic behaviour only one firm is present in this marked. Criticalities 1,2 and 3 represents strategic challenges and must therefore be noted. Criticality 1 states that if there are no initial customers, there will neither be any customers in the future. Thus, in order to get things going and to benefit from the positive feedbacks in the market, a customer based must first be established (i.e. s(0)>0). Criticality 2 represents this crucial initial customer base. Typical ways of trying to obtain this base are giving the product away for free or bundling it with a complementary product which is not subject to network externalities. Section 8.4 outlines how CityMob solves this problem.

Since the value of a product that is subject to positive feedback is related to the number of customers, even with initial customers the product value will be relatively low in the early phases of the product. This is why a latency period can be observed. This is marked as criticality 3 in Figure 8.2. In the latency period the marked increases very slowly, before an "explosive" growth can be observed.

When two or more companies compete in a market with strong positive feedback,
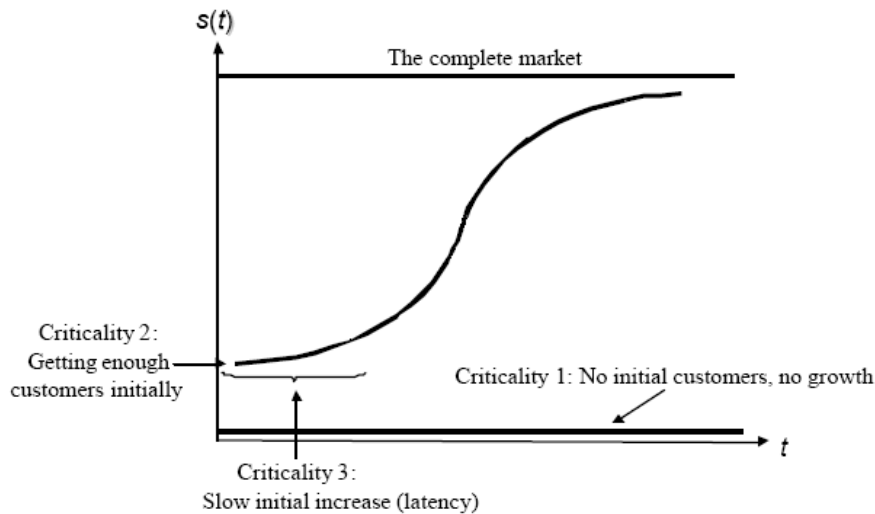
Figure 8.2: Behaviour of a market subject to positive feedback. 3 points that need strategic considerations are addressed.[7]

only one can end up as winner[14]. The classical phrase: "the rich get richer and the poor get poorer" is highly applicable in such markets. It is highly unlikely that all will survive. Examples are Beta versus VHS, and the operating systems market, where Windows is the domination actor.

8.4 MyCityGuide

The final version of MyCityGuide will contain features that are subject to positive feedback. That is, features which increase the value of the program according to the number of customers.These features are:

- **User Rated Content (USR).** Already in the MyCityGuide-prototype, which is described in Chapter 14, do users have the option to rate restaurants, events etc., with a rank from 1-6 stars. The average value of all previous ratings are shown to the users and can be taken into consideration before making a decision. Naturally, the star-values become more valuable according to the number of user ratings.

- **User Generated Content (UGR).** UGC refers to various kinds of media content that are produced or primarily influenced by end-users. CityMob will consider incorporating UGR content after MyCityGuide has a customer base. Users could then add recommendation to future events, post events themselves, add restaurants and similar.

- **Mobile Community.** Mobile Community has been tipped for some years to be a "killer application". It has however yet to happen. A community is subject

to strong positive feedback. A community with few or zero users has no value. CityMob are considering adding community functions to MyCityGuide. This is explained in Chapter 16 which outlines CityMob's work toward a final product.

It is important for CityMob that MyCityGuide avoids the pitfalls of positive feedback. This pitfalls are explained in Section 8.3 and denoted criticalities 1 and 2. An initial customer base is necessary before positive feedback helps a product. The measures taken by CityMob are:

- **Features without positive feedback.** MyCityGuide's main functionality is presenting city information to the users. By this functionality, MyCityGuide acts as an intermediate between content providers and users. This functionality is not subject to positive feedback. Thus, the MyCityGuide does not depend on positive feedback and an initial user base to get started.

- **Give it away for free.** CityMob will distribute MyCityGuide free of charge (at least in an initial period). This will aid the building of an initial user base.

- **Cooperation.** CityMob will collaborate with city magazines in order to get content for MyCityGuide. These players already have an user base. Some of them also have on-line communities. MyCityGuide will complement these magazines and thereby gain from their users.

- **Postponing features.** CityMob does not integrate community or UGC (at least not as a main feature) before MyCityGuide have an established user base. The 3 already mentioned items will build this user base.

CityMob will use the features which do not exhibit network externalities in order to build a user base. Not before a user base is obtained, is features which are subject to strong network effects going to be released. This order of events make sure that MyCityGuide avoids the pitfalls of positive feedbacks. Instead, positive feedback will contribute to additional growth.

The fact that CityMob first launches features not subject to positive feedback in order to create a foundation which makes other services valuable, resembles the history of the popular SMS service. SMS was never planned to become a text messaging system, and the service was latent for many years. However, when the service first took off, it rocketed. This was possible because another service, namely speech, had resulted in that almost everyone owned a mobile phone capable of sending SMS. The speech service on mobile phone, did not have any problems with network externalities because of the possibility to call landline phones. When people first started to use SMS as a text messaging system, the user base was already established, and therefore no problems with network effects occurred.

Content Based Charging in the Internet

MyCityGuide is an internet service which resides on top TCP (Transmission Control Protocol). Users create request toward the CityMob database which then replies. Internet access is provided by telecom operators through the mobile networks GSM and UMTS or through Wi-Fi-hotspots or LANs delivered by internet service providers. These access networks are presented in Chapter 5. CityMob must pay access charges in order to have its server connected to the internet and users must pay charges to connect their mobile devices to the internet. When both ends have paid their access charges, communication is possible. The content provider does not need to know which access network is being used or worry about negotiating with every potential user's ISP.

The internet is build up of huge investments in infrastructure, especially done by the telephone companies. It is natural that these companies want to charge usage for of their pipes in order to get return on investment. This chapter seeks to explain why it is hard for ISPs or telecom operators to create a toll road between content providers and their users. If CityMob had to pay extra to the ISPs in order to reach potential users, it would have been a major obstacle for MyCityGuide.

This chapter starts with a presentation of how network and applications are separated in internet in Section 9.1. It will be explained that this is important in order to understand how value can be created. Section 9.2 explains why it is difficult for ISP to be aware of which services and applications run over their network. Section 9.4 sums up the important aspects from this chapter and the consequence for CityMob.

In this chapter the term internet service provider (ISP) is being used in order to describe operators which provide mobile users access to the internet. Access networks can be GSM/GPRS, UMTS, Wi-Fi hotspots, W-LANs, WANs or any other way of accessing the internet.

9.1 Network and Application Separation

Section 9.1.1 outlines the difference between the public switched telephone network (PSTN) and the Internet regarding services and network. In Section 9.1.2, the difference between services and network is highlighted by drawing a line of demarcation. This separation is being used to explain the money-making logic in the Internet. ISP and network operators make their money by providing access. The different access charging models are explained in Section 9.1.3.

The main parts of this section are based on discussions with professor Jan Arild Audestad and [6] written by him.

9.1.1 Internet vs PSTN

The telephone network is an example of network adoption to a single service model. Its basic mission is to enable conversations between people by carrying a pair of analog signals in real time. The network is engineered making its characteristics (bandwidth, dynamic range) match the human voice. The service and network part is so closely intertwined that they are hard to distinguish. When additional services are imposed to the network, signal encoding is needed in order to resemble the characteristics of a voice conversation.

The internet is on the other hand built to support multiple services. All services which are capable of being translated into a binary exchange of data can be mapped into the Internet. Web access, mail, chat and file transfer are the most typical examples. But the network is not defined by the services it supports. Thus, is it not network centric as the traditional telephone network. Internet can be classified as a stupid network [33]. It is merely a transport network for interactions between computers at the edge of the network, not for interaction between the network and the devices at the edge. It consists of a stupid core offering few services. Intelligent terminals in the periphery are therefore needed in order to create services.

The mobile phone networks GSM and UMTS offer services to both stupid and intelligent terminals. Mobile phones contain processor and can therefore be thought of as intelligent. However, delivery 5 of the UMTS specification offers only IP based communication and does not have intelligent functions in its core[64].

9.1.2 The Line of Demarcation

The Internet can be divided into two parts by a demarcation line. This is shown in Figure 9.1. The bottom layer in the model is the network layer represented by IP (Internet Protocol) The top layer is the transport layer where the two transport protocols TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) belong.

Terminals can be any type of device containing a CPU (Central Processing Unit) and an connection to the Internet. The examples relevant for this discussion are mobile phones, personal computers (PCs) and servers.
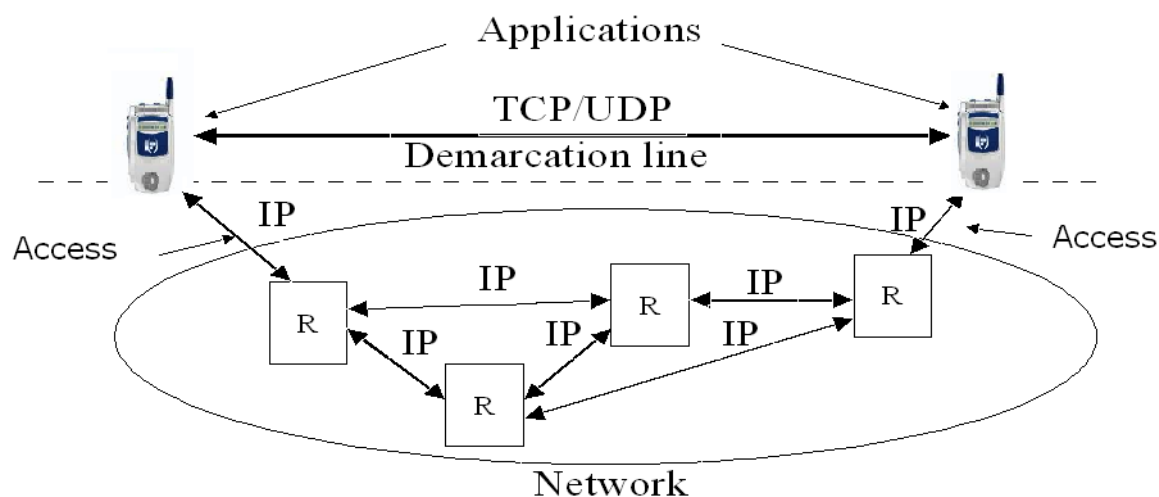
Figure 9.1: Separation of internet functionality. The upper side of the demarcation line is the realm of services and applications. ISPs and network operators reside below the line.

Between the two layers in Figure 9.1, a line of demarcation is drawn. This line illustrates the important separation between network and applications. The business and payment models are completely different on each side of the line. Knowledge of this separation is necessary in order to understand the value creation logic in the internet.

Under the line of demarcation is the network with its routers. The telecom operators and ISP reside below this line and own the routers, cables and network support systems. The routers are interconnected through the IP-protocol. IP is a very simple protocol which routes traffic on a packet per packet basis between terminals. (is packet oriented / connectionless.) An IP packet contain an address which the

routers use to forward it to its destination. IP also supports multicasting. There are also additional protocols being used on the network layer but these will not be mentioned here.

On the upper side of the line of demarcation is the realm of software, applications and services. MyCityGuide is located on this side. Other examples are internet telephony, e-banking, e-newspapers, email, homepages, file share software and so on. This type of services only needs a network providing them sufficient bandwidth. This could have been provided by a range of networks, however IP is the leading technology now and is likely to prevail in the future.

9.1.3 ISP Charging Models

Telecom operators and ISPs provide the access between terminals and the network layer. Several charging models exist which are explained shortly here. The different models directly affect the users of MyCityGuide.

- **Flat rate.** The users pay for a subscription (per year /month) and the price is independent of usage, hence the term "flat rate".

- **Volume based.** Users are charged according to their use of resources. This can be measured as number of bits, IP-packets or the bandwidth being used.

- **Time based.** Users pays according to the time they are connected. This is however not possible for packet based networks such as IP. For such network this would be equal to the volume based model.

- **Number of accesses.** Users are charged according to how many times they connect to the network. As before, this is not possible for packet based network because then the number of accesses are equal to the number of packets sent. This equals the volume based model.

- **Content based charging.** ISPs charge according to which services the users utilize. This model can be used in combination with one of the other models but requires that the ISPs know which services run over their networks.

Different ISPs may employ different charging models. This means that the users (and potential users) of MyCityGuide are charged in different ways for their use.

Users who already have a "flat rate" subscription, do not pay anything extra for using MyCityGuide. This lowers the usage barrier and favours therefore CityMob mostly. In this case the ISPs get increased revenues from increased usage of application/services residing above the line of demarcation and does therefore not have an incentive to stimulate such use.

ISPs which have the volume based charging model will get increased revenues as a result of increased traffic created by applications and services. Even though ISPs have an incentive to stimulate services in order to get higher traffic volume at the IP-layer, CityMob does not expect that it compensates for higher end-user costs.

An issue with the volume based charging model is a correct price setting per volume unit is difficult for the ISPs. If the price is set to high, no one will download films or music. If the price is to low, there is nothing to earn on voice communications. If the volume based charging is to be viable it requires that the price to be set according to the service. This requires requires ISP service/application awareness.

The content based charging model is threatening to CityMob's business. The traffic pattern generated by MyCityGuide is highly asymmetric. The user only generates small data packets as requests to the server which in turn sends relatively big replies. In order to get revenues for this asymmetric traffic, ISPs could either levy the charges against the user (received traffic charge) or against CityMob (sent traffic charge). In either way, the charge would in the end have to be paid of the users and result in a more expensive service. This model is difficult to implement because it is hard for ISPs to obtain knowledge of which services run over their network. In addition, it is difficult to to put services into simple categories. Some services will always partly belong to two categories. Multimedia services are often a mixture of data files, pictures, voice and moving pictures.

Section 9.2 explains the difficulties in implementing charging models that differentiates on services. As it has been shown, this is necessary both for the content based charging model and for a volume based charging model that seeks to implement different charges according to service (e.g. voice, video, music, file share).

9.2 Service Awareness

Internet consists of two-ways communication between two end points, either between a client and a server or between two clients. In either way both ends pay for access to internet. That is, ISPs get compensated at both ends. If charging based on content was implemented CityMob could be forced to pay twice, once to their ISP (internet access for CityMob's server) and once to the ISP of every single user who utilize MyCityGuide. This would of course be an unfortunate situation for CityMob, but would also alter the many-to-many nature of how information is linked together in the internet.

This section highlights why content based charging is difficult to implement for ISPs.

First it presents why service awareness is useful to the network. Section 9.2.2 presents the methods ISPs can use to get information about which services that run in their IP networks and how these methods can be circumvented. Skype is in Section 9.2.3 being used as an example of how difficult service detection can be.

9.2.1 Advantages of Service Awareness

In addition to the possibility of content based charging(explained in Section 9.1.3), service awareness can be used in several different areas. The most common use is identification in network firewalls. A firewall is a network element that allows or discards packets based on rules defining allowed and disallowed services. Users can configure a firewall to discard unknown or "hostile" services.

Service awareness is also important in Quality of Service (QoS) management. More knowledge of the traffic characteristics in a network can help to determine how an improvement of the network can be done. Different services demand different QoS parameters (e.g. delay, jitter, packet order). For instance voice traffic typically has higher requirements regarding delay than mail traffic. Active network elements, such as routers, continually inspect the packet headers and dynamically adjust the QoS response. In cases of high network load, different types of traffic can therefore be prioritized over others. This will result in a better user experience. As stated by the Internet Architecture Board in RFC 3639 [27]:

> "...having stable and globally meaningful service identifiers visible at points other than the end systems can be useful for the purposes of determining network behaviour and network loading on a macro level."

Service awareness has by some ISPs been used to design charging models in order to alter the usage profile of the network. E.g, higher user rates for file transfer during day time should give users an incentive to transfer large volumes at night.

9.2.2 Service Identification Methods and Circumvention

The Internet does not require knowledge of which services it is being used for, but as it was explained in Section 9.2.1, awareness is useful for some purposes. Within IP, service awareness is provided through the port numbers. The protocol number in the IP packet header, and the port numbers in the TCP and UDP packet headers are designed for service identification[27]. Certain port numbers are by convention used for certain services. These port numbers are considered to be "well known" on the source or destination side of the communication. Examples are port 80 for HTTP (web) traffic and port 25 for SMTP (mail) traffic. The Internet Assigned Number Authority (IANA) has a registry of assigned protocol and port numbers. These can be found at[9] and[8].

Listening to these fields in the protocol header enables the network to make some intelligent guesses about the service associated with each packet. A packet with an IP protocol field of 6 and a TCP destination port field of 80 would be a part of a request from a client to a web server, using the HTTP protocol. This identification method is highly scalable since only the TCP/UDP port numbers must be recorded to identify a particular service. It is also highly robust since a single packet is sufficient to make a successful identification [49].

Port number-based identification is unfortunately increasingly inaccurate. Masquerading services to circumvent the identification methods based on service number and protocol numbers is a trivial task. Both port numbers and service numbers can be altered and thereby providing some disguise of the actual service. Use of IP level encryption scrambles all the bits of the packets below the outer IP header and makes TCP and UDP port information unavailable. Tunnelling and session rendezvous mechanisms are other examples. A model popular nowadays is embedding IP inside an HTTPS (secure HTTP) session. HTTPS then functions as a thin camouflage tunnel that makes the service look like a secure web session [31]. No firewall or ISP would block normal web traffic.

As an result of the difficulties with port-based detection, a payload-signature identification technique has emerged. This technique processes packet payloads for patterns or signatures that univocally identify any given protocol. A problem with this model is the high speed at which such pattern matching algorithms must be executed at while at the same time deal with memory and CPU limitations. An additional problem can be seen in the fact that openly available and reliable protocol specifications are lacking. Some new applications (such as Skype, will be discussed in next section) encrypt or scramble the payload in order to defend the privacy of the information exchanged between their users. Consequentially, the payload-signature technique is useless [49].

9.2.3   Example: Skype

Skype is a peer-to-peer internet telephony program launched in 2003. It has experienced rapid growth and reached 171 million registered users worldwide in February 2007 [57]. Skype has a broad range of features which include free voice and video conferencing. SkypeOut allows users to call traditional telephone numbers, including mobile telephones, for a fee. Skype is known for its ability to overcome common firewall and NAT (Network Address Translation) problems.

Skype represents potential severe revenue leakages by bypassing international call accounting structures used in PSTN. SkypeOut was banned in China already in September 2005[41]. In the United Arab Emirates users are blocked access to the

Skype.com web site in an attempt to prevent them from buying SkypeOut credits
[67].

In some cases the telecom marketing departments are highly interested in what
percentage of their customers are using Skype. By doing so they can decide whether
they want to launch their own commercial VoIP service. In other cases,
unpredictable bandwidth consumption and security issues are concerning enterprise
IT managers. Many of these enterprise IT managers are responding by requiring
that the carrier actually block Skype traffic before it hits their private networks.

Skype uses a combination of techniques in order to avoid detection and thereby
possible blocking. Like many other peer-to-peer (P2P) applications, Skype changes
the port is uses each time it starts. That is, it does not exist a standard port for
Skype. Both destination IP addresses and destination port numbers also changes
each time Skype runs. It can communicate through both TCP or UDP, and even
TCP over port 80 [49].

Skype uses encryption to secure all communication. It is also normal that
communication passes through intermediate nodes and these nodes may be different
for every call. Since Skype is P2P protocol, the peers (IP addresses) a Skype agent
connects to are many and constantly changing. Skype does not only provide voice
communication, but also chat, file transfer and video services. Apparently all these
services are passed together, which makes it difficult to separate out a single service
from another.

This combination of challenges renders Skype notoriously difficult to detect using
scalable, accurate algorithms.

9.2.4 The Net-Neutrality Debate

It has been argued in Section 9.2 that it is possible to disguise services from the ISPs
in order to avoid blockage. However, ISPs can choose to give better conditions to
companies which pay extra. This is the basis for the "The Net-Neutrality Debate".
A neutral network is best defined as a network design principle. The idea is that a
maximally useful public information network that aspires to treat all content, sites,
and platforms equally.

If the net neutrality principle disappears from the internet, service providers might
have to pay several ISPs in order for them to access their services. This could give
especially small companies difficult terms of living. However, the debate of net

neutrality is likely to be ended by the regulation authorities in the respective countries.

9.3 Discussion

As explained in Section 9.2.2, applications can circumvent the ISPs' attempts to identify them. If new service identification methods are invented in order to obstruct or hinder applications or services, the natural and observed response is the invention of a way to circumvent them. This could go on until the services deliberately hide all service information from the network. The concept of "well known" service ports would then disappear and be replaced with masquerading, scrambling data, dynamic port selection or overloading of one of two port addresses for all services. The service selectors would be placed within the payload rather than in a network-visible location [31].

As the Internet Architecture Board (IAB) states in RFC 3639 [27]:

> "...various measures by intermediate systems that are intended to filter or prevent the transmission of traffic based on the service identification within the traffic flow will have a limited effect. This will also have a major side-effect of forcing the affected services to be redesigned using various forms of encapsulation or dynamic port negotiation in order to remove the fixed service identification from the IP packet headers. The IAB does not believe this serves the general interests of the Internet community related to the design of simple and reliable Internet applications."

outlines the difference between So whether it is a network administrator wanting to block "hostile" traffic, a regulator directing ISPs to block all undesired content (e.g. VoIP traffic, undesired web content), or an ISP wanting to detect services in order to block or charge them, the result will be the same: Extra cost and increased complexity for little or no benefit. If many services were to use arrays of proxy against, dynamic port negotiators, encapsulators and decapsulators, the resulting network will be more complex, less robust and probably more expensive for the users.

9.4 Chapter Summary

This chapter has explained the important separation between network and applications in the Internet. The business models are different on each side of the demarcation line. Thus, this separation is important for an understanding of the money-making logic in the internet. ISPs and telecom operators reside under the line of demarcation and earn money by charging users for access. The are different charging models possible and the "flat rate" model is identified as the one which is

most positive for MyCityGuide's success. Above is the realm of software, applications and services. This is where MyCityGuide resides.

The service identification methods available in IP networks can all be circumvented by creative application developers. ISP and telecom operators would get little gain if they tried to levy charges based on content. It would, however, result is an internet with increased complexity. The rise of a content based charging model which gives MyCityGuide worse terms of living is therefore unlikely.

Internal Analysis

Knowledge of how a firm creates value along with its strengths and weaknesses is important in order to make the right strategic decisions. This chapter presents an internal analysis of CityMob which aims at gaining this knowledge. The business plan for CityMob contains an abstract of this chapter.

Section 10.1 analyses how CityMob creates value and presents its correct value configuration according to the framework made by Stabell and Fjeldstad in [58]. Both primary activities and support activities are pointed out. Section 10.2 focuses on CityMob's strengths and weaknesses. These strengths and weaknesses have, along with an external analysis, been used in the SWOT- (Strengths, Weaknesses, Opportunities, Threats) analysis, presented in the business plan.

10.1   Value Configuration Analysis

Michael Porter's value-chain [52] was once the only framework for describing how businesses create value. This value-chain model purports to identify the set of key generic activities which all businesses perform to generate value for customers. After the model was introduced by Porter in 1985, countless managers have applied it to their businesses in order to analyse how they create value and how to formulate new and competitive strategies.

Research done by Fjeldstad and Stabell [58] have shed light over the limitations of the value-chain model by showing that it is most relevant for companies which make

products. In order to capture the value creating logic of all industries they have introduced two additional generic value configurations, value shops, and value networks. Fjeldstad and Stabell propose therefore that value-chain analysis needs to be transformed into a value configuration analysis. These three models will be explained in short in the next Section 10.1.1, more detailed information can be found in [58]. A value configuration analysis of CityMob will be presented according to the proposals of Fjeldstad and Stabell in Section 10.1.2. Section 10.1.3 presents CityMob's primary and support activities as a value network.

10.1.1   Alternative Value Configurations

 Value Chains transform inputs into products; products have value at each intermediate stage of the process. The value chain model applies best to companies in manufacturing and distribution industries. In some businesses there are large interconnected systems of value chains. Porters terms this a value system. A value system includes the value chains of a company's supplier (and their suppliers all the way back), the company itself, the company distribution channels, and the company's buyers (and presumably extended to the buyers of their products, and so on).

Value Shops create value by mobilising resources to create individual solutions to customer problems or to exploit market opportunities (Fjeldstad and Stabekk use the term shops as in workshops, not retail shops). They are focused on problem solving, opportunity assessment, resource mobilisation and project management. Examples are curing an illness, delivering a solution to a business problem or putting up a theatre show.

Value Networks, according to Fjeldstad and Stabell's definition, are single companies that configure themselves to create value by mediating exchanges across a network of their customers. The company itself is not the network, it rather provides a networking service based on meditating technology. Examples are telecommunication companies, retail banks, insurance companies and postal services.

In contrast to the customers of chains and shops, customers of value networks often care who the other customers of the network are. This is because much of the value they receive is derived from explicit or implicit exchanges with these other customers.

10.1.2   Value Configuration Analysis of CityMob

As argued in[58] businesses may appear to exhibit the characteristics of different configurations. There should however be one single overarching model that defines

the way the organisation creates value.

During the development phase, CityMob has the characteristics of a value shop. It seeks to mobilise resources (people and knowledge) in order to exploit a market opportunity. The development phase is characterised by an iterative process where a solution is to be constructed after information has been collected. Our solution, the mobile city portal, needs to consider both customer (city magazines) and the end-users. In addition, there are other players like map-providers, network operators and LBS providers. All these considerations require the usage of different skills. The marketing of MyCityGuide also resembles the characteristics of a value shop.

After MyCityGuide is developed and brought to the market CityMob also exhibits some of the characteristics of the value chain configuration. MyCityGuide requires input from both map-providers, city magazines and premium-SMS providers. CityMob's ability to use and minimize the costs of these inputs as well as an effective distribution of MyCityGuide resembles a value chain.

After MyCityGuide has become a successful product with a solid user base, value network characteristics are more dominant. Especially the MyCityGuide-community solution needs a user base in order to add real value to the application. The perceived user value of a community increases with the number of reachable users. When another user joins the community, the value increases for those already using the community. A substantial part of our revenue model also depends on the number of users. Advertisement incomes are directly linked to the number of people who can see the advertisements, that means, the number of users. In the same way, revenues from promotion of certain clubs, restaurants etc., depend on the number of users. The value for users of CityMob's city guide (MyCityGuide)depends on the number of city magazines that CityMob collaborates with. The more collaboration agreements CityMob establishes, the more cities are covered by MyCityGuide. For the users this means added value. For a discussion on MyCityGuide features which exhibit positive feedbacks see Chapter 8.

CityMob's business resembles a "newspaper-model". A newspaper exhibits the characteristics of all the configurations. Printing and distribution is a value chain. Covering the users need for news and stories are a value shop. The value of advertisements increases with the number of readers. This is a characteristic of a value network. A newspaper can not only choose one of these configurations. This results in a separation into three parts where each part can focus on its main competitive advantage.

In order to find the correct value configuration, three questions need to be asked. What is the most correct statement:

- CityMob creates value by transforming inputs into products.
- CityMob creates value by linking customers together.
- CityMob creates value by (re)solving customer problems by adapting the service.

Even though low cost and efficiency is an advantage, CityMob does not primarily create value by having lower cost or more efficient production than its competitors. Neither does CityMob solve customer problems over and over. CityMob rather helps customers solving their own problems through MyCityGuide. This is done by the mobile portal MyCityGuide which links different actors together. CityMob therefore relies on mediating technology and creates value by facilitating exchanges between customers. The value of the portal depends on the number of exchanges which are possible. Based on this, it is clear that CityMob's overarching value configuration is a value network.

MyCityGuide provides links between:

- Advertisers and end-users. Advertisements on MyCityGuide can be seen by the users, and the value of the advertisements depend on the number of people who sees them.

- End-user and end-users. The community functions are exchanges between users. The value of the ranking, the user generated content, and the blackboard/forum (or similar solutions) depend on the number of contributors.

- City magazines and end-users. MyCityGuide gives city magazines s a new communication channel to those already using their service (on the Web or printed form) but also enables them to reach new user groups. Through company branding and a revenue sharing model with CityMob, city magazines will get increased revenues with increased number of users. The number of city magazines collaborating with CityMob affects the service value for the users. A greater number of city magazines implies that more information is available through MyCityGuide. Typically this would mean more cities, but different types of content within one city could also be a possibility.

The fact that MyCityGuide is subject to network externalities introduces unique strategic challenges. This is discussed in Chapter 8.

10.1.3   CityMob as a Value Network

As argued in the the previous subsection, CityMob acts as a mediating company and therefore have the value network configuration. As a mediating company, primary and supporting activities can be identified. These are shown in Figure 10.1. The figure is inspired by the framework presented by Stabell and Fjeldstad [58] The three primary activity categories overlap in order to underline the concurrent interactivity relationship between them. Since value is created by mediating between city magazines, end-users and advertisers, the figure does not contain an arrow which underlines the final "customer".

CityMobs primary activities are:

Network promotion and contract management

CityMob must promote its network towards end-users, city magazines and advertisers. Furthermore, CityMob must select which city magazines that should be invited to its network in order to increase network value. Marketing of MyCityGuide is necessary towards end-users. Companies interested in buying advertisements space on MyCityGuide need to be found and negotiated with. Advertisements agencies can alternatively be an intermediary link. As the network value increases related to the number of end user, this will be an interactive process. A set of contracts which commit both CityMob and the collaborating parties to a mutual set of obligations, is needed. These contracts must be initiated, managed and terminated. They should govern service provisioning and charging.

Service provisioning

Service provisioning consists of activities associated with establishing, maintaining and terminating links between the actors connected to the mediating service and billing them. Billing schemes are agreed on in contracts. CityMob must measure the usage of MyCityGuide in order to correctly charge advertisers (directly or indirectly) and possibly city magazines. Charging users for "Premium-services" is also a possibility.

Infrastructure operations

These are activities related to assuring that MyCityGuide is running properly. Database maintenance (upgrading), application patching, and city magazine interface, are important operations. Adapting MyCityGuide to newly released mobile phones can also be considered to be an infrastructure operation since it is necessary in order to make the service to run.

Stabell and Fjeldstad [58] also recognise four support activities. These are:
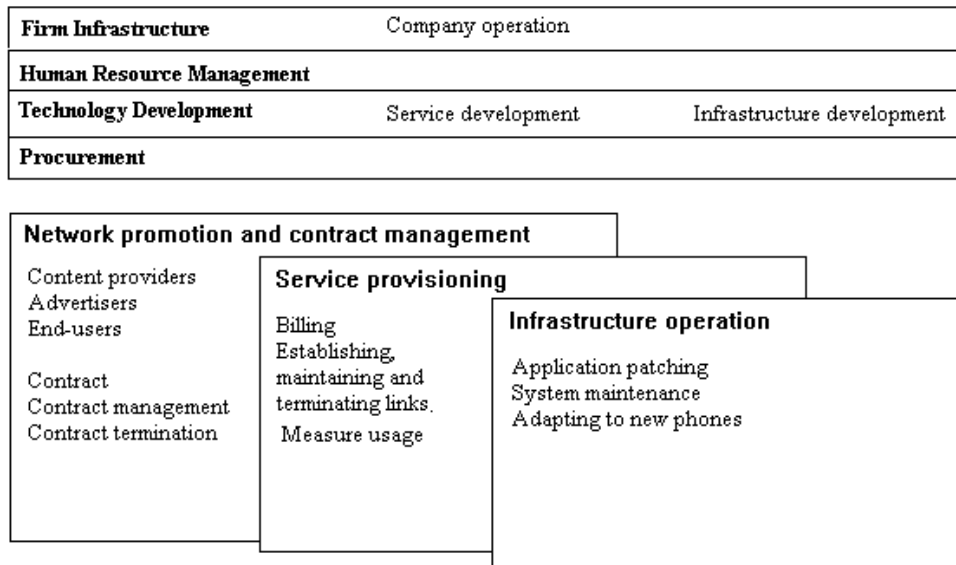
Figure 10.1: Value network diagram for CityMob. Both primary and support activities are shown.

- Company Infrastructure.
- Human Resource Management.
- Technology Development.
- Procurement.

Company infrastructure is concerned with operating the company, i.e. general management financing and management information systems. Technology development can be divided into service development and infrastructure development. Modification and development of MyCityGuide belong to this area. Infrastructure development could be new database technology, modification of customer interfaces, communication protocols and similar. Procurement is linked to network infrastructure and service development. Examples are the purchase of more servers, test devices, a new internet domain or increasing bandwidth.

10.2 Company Strengths and Weaknesses

This section identifies CityMob's strengths and weaknesses.

10.2.1 Company Strengths

- **Small size:** The small size of CityMob and thereby its fast decision-making, enables the company to quickly adapt to changes and redirect the focus

according to the market's needs and opportunities. No path-dependence: It can create business from scratch, and is therefore more willing to pursue completely new approaches.

- **Experts:** CityMob has a network of experts which aid in both business as well as technological issues. The German incubator UnternehmerTUM, provides CityMob with all their expertise and knowledge. CityMob has an invaluable connection to the Norwegian University of Science and Technology.

- **Market knowledge:** CityMob's team are themselves a part of for MyCityGuide's target group . This implies direct knowledge of user needs through both own experiences and a contact network in the target user group.

- **Development framework** play.tools is a development framework provided by CityMob's incubator UnternehmerTUM. play.Tools reduces the development time and thereby enables faster adaptation to the market.

- **Highly Educated team:** CityMob's team consists of graduates from the best technical university in Norway (NTNU).

10.2.2 Company Weaknesses

Liabilities of newness:

- CityMob has a low company capital and no customer base.
- CityMob has yet to produce its first product and is not a known player in the mobile application market. Neither is the company known from other businesses.
- CityMob's full-time employees have limited experience in bringing a business idea to the market.

Liabilities of smallness:

- CityMob has limited negotiation power towards city magazines, map providers and premium-SMS providers.
- CityMob can neither have its own marketing department and need external help to e.g. accounting and legal issues.

10.3   Chapter Summary

This chapter has presented an internal analysis of CityMob. CityMob creates value by providing a mediating service which enables exchanges between users, customers and advertisers. According to the framework developed by Stabell and Fjeldstad [58]

CityMob's overarching value configuration is a value network. The primary activities are service provisioning, infrastructure operation, network promotion and contract management. Service provisioning is creating and maintaining links between the parties connected to the network. Measurements of usage and billing are also parts of service promotion. Infrastructure operation is actions taken to make sure that MyCityGuide is running properly. Network operation deals with identification of which customers to bring to the network in order to increase its value. Contract management govern the interests of both CityMob and its collaboration partners.

CityMob's strengths and weaknesses arise from the size of the company. A small company can easier adapt to changes in the market than a big one. However, negotiation power, capital, customer base and reputation are limited. CityMob needs to take these strengths and weaknesses into consideration when deciding upon strategies.

The Mobile Business Landscape

The Mobile business landscape consists of a large number of actors trying to position themselves in favourable places in the value system.

CityMob will figure in a value network within the telecommunication industry. As it will be explained here, this network consists of several actors and customer value is generated by combining the core capabilities of all these actors through relationships. Core capabilities define the company's ability to deliver services and goods which satisfy customers' needs coming from the market. A good understanding of how income is generated in the value network and how it is distributed among its members is essential in order to create successful business models.

The mobile business has some peculiar characteristics which differentiates it from other businesses. These are explained in Section 11.1. Section 11.2 presents and categorises the actors in the mobile business landscape. CityMob's role and collaboration partners in this system are given in Section 11.3.

11.1 Mobile Business Characteristics

The mobile business industry has some peculiar characteristics which enterprises must take into consideration when developing their business models.

Naturally, the cardinal characteristic, which m-business builds it value proposition upon, is mobility. In fact, applications and services for mobile phones are likely to be

inferior to their desktop counterparts on all fields except mobility. The inferiority origins from small screens, imperfect keyboards, slower and more expensive network access. Mobility can further be divided into [13]:

- Ubiquity: A user has access to network and services independent of location.

- Reachability: A user can be reached anywhere and at any time. A user can also choose to limit his/hers reachability to certain time slots or persons.

- Localisation: A user's location can be used as a context. Many Location Based Services (LBS) have emerged in the last years. Positioning techniques are presented in Chapter 6.

- Convenience: Users always have their mobile device at hand. This makes accessing services from the mobile phone convenient as no additional device needs to be carried around. This is why mp3-players, cameras, radios and GPS have emerged on mobile phones.

In [13], instant connectivity and personalisation are also mentioned, but these characteristics do not separate services for mobile from services available on a desktop computer.

Network effects are are an example of positive externalities. An externality occurs when a transaction between two actors affects a third actor which is external to the transaction. It is often argued that network effects have an important impact on pricing, willingness to pay, and adoption. Network effects, positive feedback and externalities are explained in Chapter 8.

Examples of networks effects are the following: Users benefit from network size. More users also increases the incentive to develop new services. Standardisation and open versions of products, protocols and development platforms have big impacts on the market because they lead to compatible products. For instance, the fact that most telephones can run applications programmed in the open source programming language Java, severely simplifies application development and thereby unleashes innovation power.

Exclusive control over important assets are the third characteristic of mobile business [13]:

- Radio spectrum is a necessary and finite resource for the second and third generation mobile networks. The frequency bands are regulated by the authorities in the respective countries.

- SIM (Subscriber Identity Module) cards give mobile operators control over their customers. All communication to and from a user must pass through the network of the user's SIM card provider. The operator also has access to the user's profile, call patterns and location information.
- Network infrastructure deployment requires huge investments. It could therefore be considered to be a natural monopoly. Two or more networks covering the same geographical area can seem to be unnecessary redundancy. Regulation authorities control by using antitrust laws and have opened for virtual network operators and made oligopolies possible.

In [13] it is argued that the business models which explicitly address mobility, network effects and natural monopolies issues, and at the same time are profitable to all the different actors needed to provide an end-to-end solution, will be the most successful and sustainable.

The combination of the mobile business characteristics creates a complex environment. A company striving for success is dependent on collaboration with many market players. In Europe, no single company has managed to provide an end-to-end solution entirely on its own. The different players in the mobile market are described and categorised in the next section.

11.2   Actors and their Business Models

This section gives an overview of the market by identifying the different actors and classifying them according to the framework proposed in [13], and illustrated in Figure 11.1. The main classes are: Technology, services and communication. These classes do not provide a sufficient view of the business, and are therefore complemented by regulation and end-users. End-users have needs which the other players seek to fulfil through collaboration on building end-to-end solutions. To illustrate this, the users are located in the centre of Figure 11.1. In Figure 11.2 a graphical representation of the whole industry, distinguishing the actors in the different blocks and their principal relationships, is given.

11.2.1   Technology

The technology section consists of actors which provide hardware and software infrastructure. They are required in order for other players to develop and offer mobile services and applications to the market.

The primary technology actors are mobile device manufacturers and network equipment vendors. Mobile device operating system (e.g. Symbian, Palm OS,
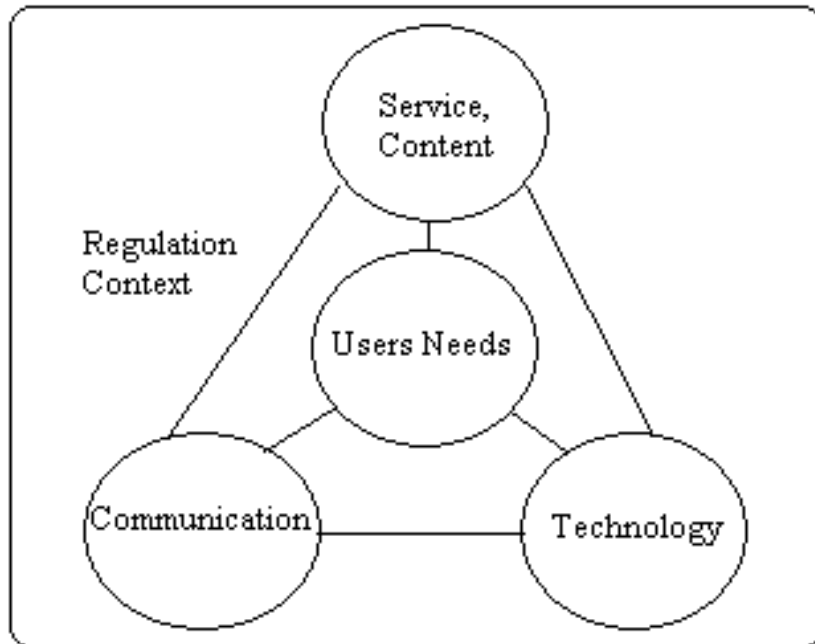
Figure 11.1: Framework classifying the main areas in mobile business. Players must collaborate in order to fulfil the users' needs. Regulating authorities provide the game rules.

Windows Mobile) providers, development platforms developers (e.g. J2ME), retailers and component makers are secondary players.

Device Manufacturers

Device manufacturers build the mobile devices (mobile phones, PDAs, notebooks). End users need these devices in order to access mobile networks and to run mobile applications. Revenue flows come from sale of devices to distributors (device retailers and network operators' distribution channels). Device manufacturers' core activities are research and development, product design, production and marketing.

Network operators often subsides mobile phones to users who bind themselves to a longer contract. The long awaited Apple iPhone can only be bought together with subscriptions from special operators (probably Vodafone and Tre in Europe). Lately it has been observed that network operators try to push UMTS enabled mobile phones to the market in order to get a return on network investments. Content providers, application providers and portals are also popular partners of the device manufacturers. Integrated software providing popular services, can help selling mobile phones. Examples are Ericsson phones which have the popular MSN instant messaging protocol pre-installed.

Examples of mobile phone manufacturers are Nokia, Sony-Ericsson, Motorola and recently Apple. Blackberry, Palm and Casio make PDAs.

Equipment Vendors

Equipment Vendors provide the infrastructure technology which is required in order to make mobile networks work. This includes air interface, routers, base stations etc. Logical infrastructure such as billing systems, network management systems and service platforms also reside here. Revenue flows are generated by selling or leasing equipment and infrastructure related service provisioning.

There are many companies providing this kind of equipment; Lucent, Siemens and Linksys are examples. Sony-Ericsson, Motorola and Nokia also play this role.

11.2.2   Services

Mobile services are value-added services, content and applications which the user can access on his mobile device. Content providers, application developers and payment agents are the most important actors in this section. Security solution providers and advertising companies also reside here. Mobile advertising is a relatively new field but it is expected to play a considerable role in mobile business models.

Content Providers

Content providers acquire (purchase, license, create or collect) data and information. The content is distributed to partners or published through integrated units. Internet and magazines are common distribution channels while the mobile channel is emerging.

Content providers typically get their income from revenue sharing agreements, syndication agreements and usage fees.

Media companies and press agencies such as BBC and Reuters are well known examples of content providers. Navteq and Tele-Atlas are the main players providing maps and city information. Information about public transport is usually available for free.

In the German market there are several actors which have their own city information content (bought or created) and publish it through magazines and/or internet pages, these are called city magazines in this report. However, in the business plan, which

is presented in Chapter 13, they are also referred to as customers. They offer information regarding concerts, restaurants, clubs, theatre, festivals and similar. Some of them have nationwide coverage while others provide information about one city only.

Application Developers

These actors build mobile applications and platforms. Applications may be stand-alone or offer access to remote services. Application developers can also provide hosting, support, integration, consulting and maintenance.

Application developers can collaborate with:

- Network operators in order to get access to their customer base or network services.

- Device manufacturers in order to get compatibility with existing and future devices or to get their application pre-installed on mobile phones.

- LCS (location Content Services) providers in order to get access to location information). These players function as interfaces between network operators and location based service (LBS) providers. They provide the network based positioning presented in Section 6.2.

- Content providers when building an information application or portal. Portals are players that purchase and bundle content from different providers together before re-distributing it to end-users.

- Payment agents in order to charge for their services and application.

- Advertisement agencies.

Application developers make money by selling and licensing their applications, usage fees, and by providing support and maintenance. There are not many known examples of pure application providers. They are usually unknown start-ups. However, big player such as Google (Google Mobile and Google maps for mobile), Yahoo!(Yahoo! Mobile) and Opera (Opera Mini) have mobile versions of their web-service.
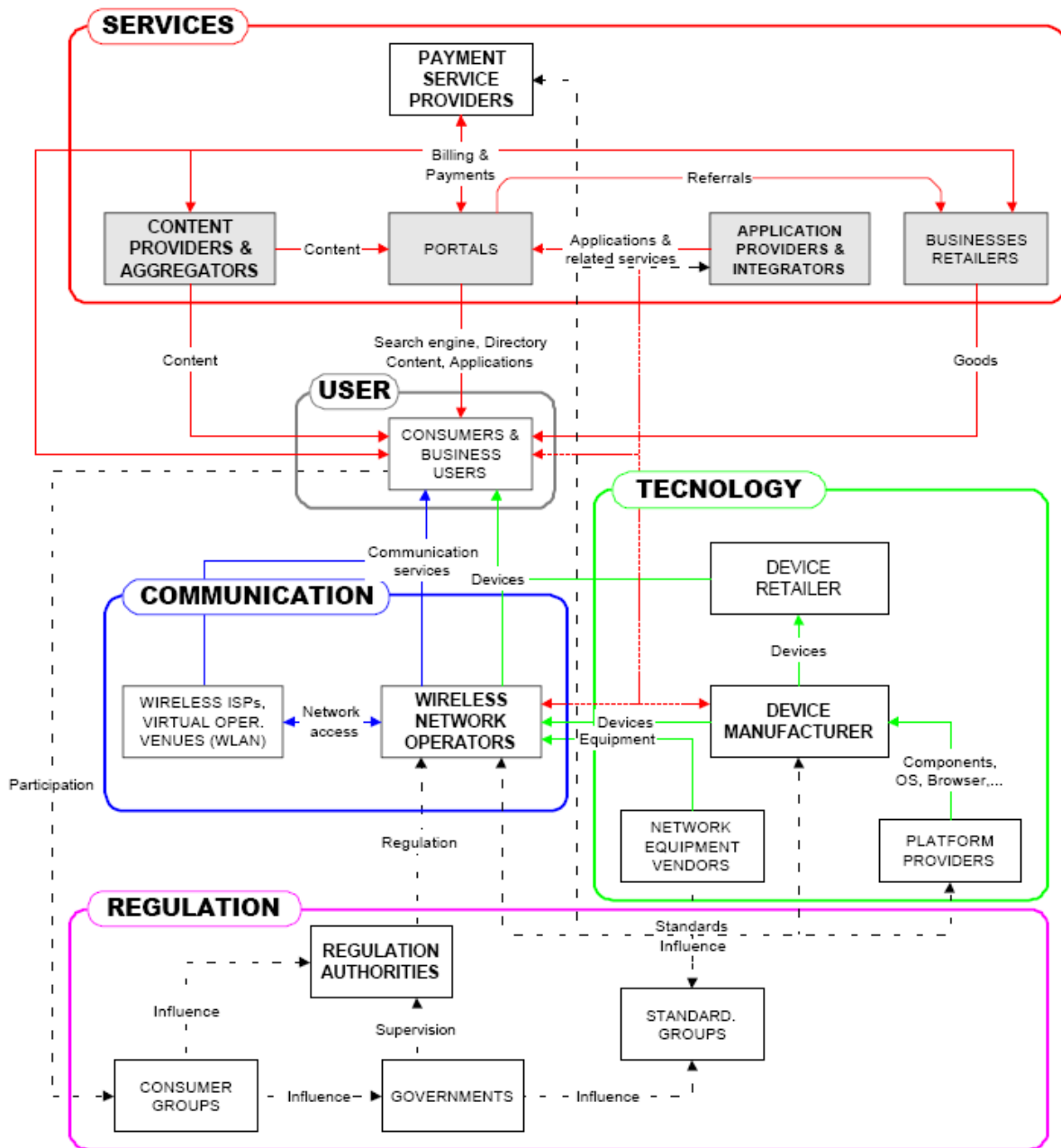
Figure 11.2: A graphical representation of the whole industry, distinguishing the actors in the different blocks and their principal relationships[13].

Payment Agents

Payment agents enable cash-free purchases of services and goods via the mobile phone. Customers can be both end-users and service providers.

Payment agents can either debit users' bank accounts (collaboration with banks) or users' mobile phone bill (collaboration with network operators). An additional possibility is to have own user accounts where money can be transferred to in order to buy services and goods. An example of a payment agent is PayPal Mobile.

An important service, which is being offered from payment agents to application developers and service providers, are premium-SMS. A premium-SMS is an SMS which can charge users more than the standard fee. Such an SMS can be used to pay for downloading applications or renewing a service subscription. The charge is levied to the user's phone bill. In Germany, premium-SMS are not offered directly from network operators but through own companies. Mecomo [42] is one of these companies that offer premium-SMS services from all the operators in the German market. By using premium-SMS, service providers do not have to be concerned with the technical and contractual challenges related to having customers who belong to several different network operators. The revenues from a premium-SMS service are shared between network operators, premium-SMS providers and the service providers.

The huge payment solution actors, Visa and Mastercard, have recently released mobile payment solutions.

11.2.3 Communication

Communication services enable mobile devices to access mobile services. Mobile network operators (MNO) and internet service providers (ISPs) are the biggest actors in this field. Mobile virtual network operators (MVNO) are players which do not have an own infrastructure but lease lines from MNOs in order to provide communication services. Clusters of Wifi-networks are also emerging in big cities and are proving bandwidth to enabled mobile phones.

Mobile Network Operators

MNOs design, build and operate voice and data mobile networks providing ubiquitous access. The mobile networks GSM/GPRS and UMTS are presented in Chapter 5. Through a MNO's network users can access other operators' networks and the Internet. In the German market network services such as LCS and

premium-SMS are offered through mediating companies which provides interfaces to all the network operators.

MNOs mainly earn money from subscriptions and usage fees from their users. Possible charging models are discussed in Section 9.1.3. Additional revenues come from premium-SMS and network services provided to other parties. Referring to Stabell and Fjeldstad, as discussed in Chapter 10, MNOs have the value network configuration. Contract management, network promotion and service provisioning are their primary activities.

MNOs often cooperate with device manufacturers by subsiding mobile phones for subscribers. In order to increase UMTS usage and thereby get return on investments, MNOs can collaborate with service providers, portals and content providers. They also have an incentive to increase usage if volume based charging schemes are applied.

Examples in Germany are Vodafone, E-plus, T-mobile and O2. Simyo is an example of a MVNO trying to compete on lower cost.

ISPs

ISPs provide access to the Internet. They build their own networks and have gateways to other networks. Wi-Fi enabled mobile phones can take advantage of unsecured LANs and hotspots. Agreements with network operators and other ISPs are necessary. As the MNOs ISPs also have the value network configuration. They earn money through subscription and usage fees and traffic agreements.

Examples of ISPs in Germany are Deutsche Telekom (T-Com) and Arcor.

11.2.4 Regulation

Regulation authorities set the legal framework which are the rules of the game for the players in the mobile arena. Licensing and selling wireless frequencies, antitrust work and monitoring the market are important activities.

11.2.5 End-Users

End-users are either consumers, enterprises or other individuals who adopt to wireless products and services. These players ultimately determine the success or failure of a mobile business. New products and services should be based upon user

needs. End-users buy mobile devices, pay for subscription and usage of mobile networks and services.

11.3 CityMob

In order to provide the MyCityGuide portal, CityMob must establish partnerships with several players. These partnerships are illustrated in Figure 11.3. The necessary partners are city magazines, premium-SMS providers, LCS providers and advertisement agencies. The dotted lines indicates that CityMob need information flows from device manufacturers and development platform providers.

This section presents the nature of CityMob's required partnerships and why they are needed.

11.3.1 Content Providers

MyCityGuide is a mobile portal. Its added-value to the users is providing an easy and fast way of accessing information regarding their current city. In order to do so, the portal must be filled with content from several content providers. The relevant content providers can be put into three groups:

- Map-providers. MyCityGuide need maps in order to show users the location of POIs (Points of Interest). It will also be used for route calculations. NavTeq and TeleAtlas are the two dominating players in this area. They create maps and map-content. They are continuously reviewing and updating their maps. In addition, there are map-software suppliers which provide the functionality (e.g. way-finder, zoom) around the maps. Examples of such companies are ArcView and MS MapPoint. CityMob will have to pay the map-providers on a per-request basis.

- Public transport information providers. MyCityGuide should also provide information about public transportation. CityMob has a collaboration deal with MVV (Münchner Verkehrsverbund) in Munich, read more in Section 15.4.

- City information providers. In Germany there are many companies providing city information to end-users through magazines and web-pages. They offer information about the cultural offerings in a city, for instance, restaurants, cafés, theatres, concerts, fairs and cinemas. The magazines have articles, recommendations and overviews in calendar form. In addition, the web pages provide search functions and ticket ordering. These players mainly their get revenues from advertisements.
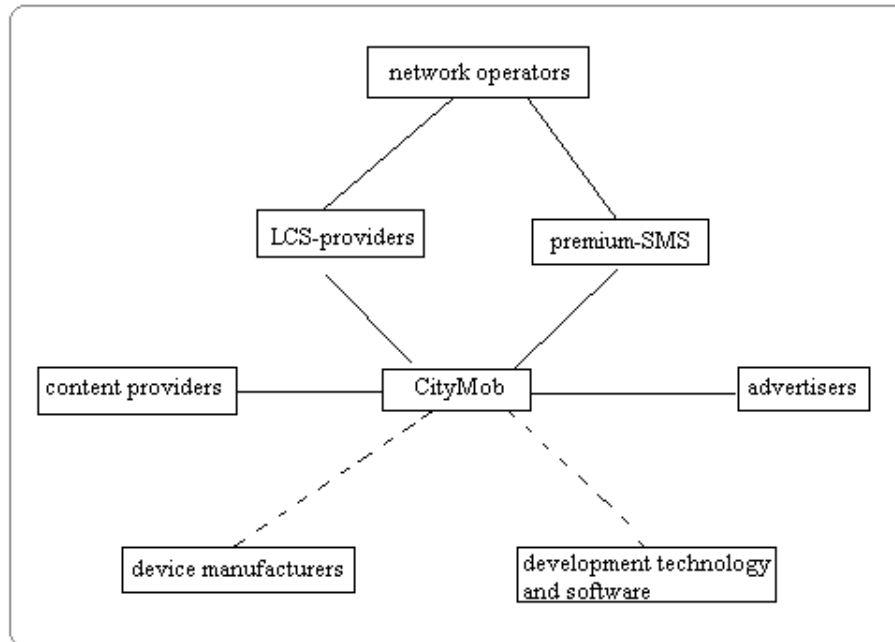
Figure 11.3: CityMob's collaboration partners. A solid line denotes a contractual relationship. A dotted line denotes information flow.

As explained in the business plan, CityMob needs a close collaboration with the providers of city information. MyCityGuide mainly mirrors their content in a manner which is suitable for mobile phones. The providers of city information on the Internet and in printed forms, is in the following, only referred to as city magazines. In the business plan, which is presented in Chapter 13, they are also referred to as customers. City magazines offer information regarding concerts, restaurants, clubs, theatre, festivals and similar. Some of them have nationwide coverage while others, which are here denoted local players, provide information about one city only. The local players usually have more dynamic and detailed information than the nationwide players.

CityMob has conducted a market research which aimed at identifying city magazines in the German market. The outcome of this research is presented in Chapter 12.

A typical city magazine has a small core team, which consists mainly technical staff and editors. However, many information collectors working part time is usual. The biggest cost of running a city information web portal is the salaries of its employees. The providers which also have magazines have the additional cost of printing and distribution of the magazine. Magazines are normally distributed once or twice a month.

The information on the web pages is available free of charge and the magazines are either free or cost approximately 1-5 Euro. Their revenues mainly come from advertising.

The MyCityGuide portal will act as a new and complementary distribution channel for the city magazines. It allows them to reach new customer groups and extend the relationship they have with their existing customers. In May 2007, CityMob entered into a collaboration with Munichx. This is presented in Chapter 15.

11.3.2 End-users

In the first phase, MyCityGuide will be distributed for free. No contract (subscription) between CityMob and end-users will therefore exist. End-users purchase mobile phones from device manufacturers and have contracts with network operators.

CityMob's target group is presented in the business plan which can be found in Chapter 13.

11.3.3 Map Solution

This subsection will look further into the different possibilities to include map in the mobile application for CityMob.

To increase the value of the city application, map was considered to be an important feature. The map industry can be represented in three main parts:

- Map suppliers: These are companies who make maps by physically driving around taking pictures and writing down what they see to then create maps. E.g. TeleAtlas, NAVTEQ, AND

- Map software suppliers B2B: These software suppliers have license agreements with the map suppliers and add functionality to the maps and additional features like find restaurants, gas stations and so on. E.g. ptv, mapsuite, ArcView, MS MapPoint

- Map software suppliers B2C: These software suppliers have license agreements with the map suppliers and they make commercial software out of the maps. E.g. Map 24, google maps and yahoo map.

In general, it won't be possible to get maps for free for mobile applications, especially

not for a commercialized application. Both Google and Microsoft are customers of TeleAtalas and NAVTEQ and have to pay per request between 0, x- 0,4 Euro.

CityMob's technology supports B2B map solutions from MS MapPoint and ArcView. This means that the client side of the framework is already configured to handle and do requests against these two map software providers. The sequence: from the CityMob technology, the client calls the CityMob technology server, and then the server functions as an adapter between the client request and the appropriate web service. CityMob has an agreement through their collaboration partner UnternehmerTUM, with a free licenses agreement on maps from both MS MapPoint and ArcView for non-commercial use. For commercialized use, a license agreement between the two partners will have to be made.

To create software from the map suppliers or to build extra functionality that supports map software providers are processes that last an estimated extra time of 2-3 months. Since there will be a lot of problems with the j2me client that only has XML-RPC [1] as a remote procedure call protocol.

11.3.4   Premium-SMS Providers

A premium-SMS is an SMS which can charge user more than standard fees (up to 5 Euro in Germany). The charge is levied to the user's phone bill. Telecom operators in Germany offer premium-SMS services through other companies. These companies are in this chapter referred to as premium-SMS providers. These players provide interfaces to all the telecom operators. Mecomo [42] is one of companies providing premium-SMS services.

Premium-SMS offers an easy payment alternative to the users. All a user has to do is to send an SMS with for instance, "MyCityGuide" to 18007. The user's phone bill is then charged. The payment could be for downloading the program, a subscription, or an upgrade in order to get access to special service features. This is a payment method many users know from ordering ring tones, background pictures and mobile applications.

The alternative payment methods is on-line payment, or standard bank payment. Both require more user effort than sending an SMS and thereby raise the payment threshold.

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[1]XML-RPC is a remote procedure call protocol which uses XML to encode its calls and uses HTTP as a transport mechanism.

The simplicity offered by premium-SMS payments, comes with a price. By using this service, CityMob has to share the revenues with the premium-SMS providers and the network operators. Figure 11.4 shows the charges from Mecomo [42]. CityMob also got a price offer from WhateverMobile [1]:

For premium-SMS, there would be at a setup of Euro 199,00 and monthly fees of Euro 149,00. Prices for the single SMS would be Euro 0,060/SMS for T-Mobile and Vodafone and Euro 0,065 for eplus and o2.

Premium-SMS providers also offer to send a service SMS from an application. For CityMob, this is the case with the "viral marketing" function explained in section refbr:ms. SMS can be sent in all networks. The fee charged by Mecomo for this service is shown in Figure 11.5.

11.3.5 LCS Providers

CityMob hopes to use network based positioning in the final version of MyCityGuide. Network based positioning is explained in Section 6.2. If this is implemented, the MyCityGuide service can have knowledge of the users' locations without user input.

The location information in GSM/UMTS is the network operators' property. However, they offer this information through LCS (location Content Services) providers. These players function as interfaces between network operators and location based service (LBS) providers such as CityMob.

Mecomo [42] is an example of a company that operates as an LCS provider. They charge a fee per request to their server. The fee depends on the monthly volume of requests and is shown in Figure 11.6

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[1]See appendix C for complete price list

Payout netto <10.000 EUR/Monat						
Premium-SMS inkl. MwSt.	Premium-SMS ohne MwSt.	Payout	Payout	Payout	Payout	Payout
Preis Endkunde		T-Mobile	Vodafone	e-plus	o2	Debitel
0,49	0,422 EUR	0,167 EUR	0,179 EUR	0,173 EUR	0,157 EUR	0,134 EUR
0,99	0,853 EUR	0,403 EUR	0,423 EUR	0,415 EUR	0,406 EUR	0,363 EUR
1,49	1,284 EUR	0,638 EUR	0,665 EUR	0,654 EUR	0,635 EUR	0,592 EUR
1,99	1,716 EUR	0,874 EUR	0,907 EUR	0,887 EUR	0,878 EUR	0,822 EUR

Figure 11.4: Costs for the premium-SMS service. Prices are in Euro, the provider is Mecomo.

SMS-Versand pro Monat	SMS
0-10.000	0,090 EUR
10.001-50.000	0,085 EUR
50.001-100.000	0,080 EUR
100.001-250.000	0,075 EUR
250.000-500.000	0,070 EUR
>500.001	0,068 EUR

Figure 11.5: Costs for sending SMS from within MyCityGuide. Prices are in Euro, the provider is Mecomo.

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LBS-Abfragen pro Monat	Vodafone	O2	T-Mobile*	E-Plus	Karten/Weg-beschreibungen
0-10.000	0,16 EUR	0,16 EUR	0,16 EUR	0,16 EUR	0,020 EUR
10.001-50.000	0,14 EUR	0,14 EUR	0,14 EUR	0,14 EUR	0,016 EUR
50.001-100.000	0,13 EUR	0,13 EUR	0,13 EUR	0,13 EUR	0,013 EUR
100.001-250.000	0,11 EUR	0,11 EUR	0,11 EUR	0,11 EUR	0,011 EUR
250.000-500.000	0,10 EUR	0,10 EUR	0,10 EUR	0,10 EUR	0,010 EUR
>500.001	0,09 EUR	0,09 EUR	0,09 EUR	0,09 EUR	0,009 EUR

Figure 11.6: Monthly fee per LBS request depend on volume. Prices are in Euro, the provider is Mecomo.

Mecomo also charges a one time payment of 1800 Euro and a minimum monthly fee of 300 Euro. Obviously, LBS-requests represent significant costs for a small company. CityMob must therefore compare the added-value from automatic positioning with the costs. Charging the users for LBS requests, or a postponement of the feature are both possibilities.

11.3.6 Advertisement Agencies

The main source of income from MyCityGuide, if it succeeds, is expected to come from advertisements within the application. MyCityGuide has reserved special places for advertisement banners. Waiting screens could also be utilized for this purpose. Advantageous placing on search results and highlighting on map, are additional possibilities.

Advertising agreements could be done directly with the interested firms, or CityMob can use advertisements agencies as an intermediary. CityMob has yet to work out a strategy here.

11.3.7   Device Manufacturers

A collaboration with device manufacturers such as Ericsson or Nokia, could have been very valuable for CityMob. Possible advantages are publicity of MyCityGuide and pre-instalment on a number of handsets. Device manufacturers are all big marked players and for a small and inexperienced team like CityMob, a collaboration is not very likely. MyCityGuide first needs proof of concept through user acceptance.

However, CityMob must be constantly updated on the mobile phones which are being produced and the trends on the market. This is necessary in order to produce versions of MyCityGuide which are able to run on the users' mobile phones. For instance, if device manufacturers start developing handsets with operating systems which are not running J2ME, CityMob would possibly have to program MyCityGuide in a new language. For instance, for security reasons, Apples new iPhone only supports applications programmed in Ajax for its mini-version of the Safari browser. In general, CityMob needs as much information as possible about handsets in order to build a program which offers a good user experience. Information is regarding the structure of the soft-keys, internal memory available, screen resolution and other device specifics.

As discussed in Chapter 6, GPS and Wi-Fi enabled handsets are starting to hit the market. This could enhance the MyCityGuide service, but also increase competition in the mobile LBS market. CityMob should pay close attention to the market development.

In the future, in order for MyCityGuide to access to device specific functions, CityMob might have to get a MyCityGuide verification from device manufacturers. After verification, a certificate will be issued.

11.3.8   Network Operators

The mobile networks operators in the German market are all big players. A collaboration with one of them could give MyCityGuide a lot of publicity. Collaborations between network operators and service providers are not unusual. They want services to differentiate from the competitors and to increase revenues from the users.

It is considered that neither CityMob's reputation, experience, nor product idea are sufficient in order to get a collaboration before MyCityGuide has a reasonable market share.

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The third generation mobile network, 3G, currently being adopted by an increasing share of the market, offers higher bandwidth than the old GSM network. This evolution makes internet browsers more attractive because minimization of the traffic volume becomes decreasingly important.

11.3.9   Development Technology and Software

These players provide the mobile operating systems, on which MyCityGuide must run, and the application development technology. The MyCityGuide prototype is developed using the open source programming language Java. Continued use of Java requires that the mobile operating systems on the market support this technology. CityMob should pay attention to the market and be prepared to change its development routines.

The increased focus on mobile phone security might decrease third party application providers use of device functions. Application verification and subsequent issue of certificates might become a necessity in the near future.

CHAPTER 12

Market Research

This chapter will look at CityMob's market with focus on the customer, the city magazines. When introducing a new product to the market, it is important to try to learn as much as possible about the potential customers. Furthermore, it is important to map the structure for the complementing services and users. The results from this research were used as guidance for the business plan and the prototype.

The goal of the B2B market research was establishing a more general overview of the market, its size, and which city magazines that exist as well as discovering difficulties in approaching these companies and also of seeing which type of need the different city magazines wanted to cover by a mobile application. Furthermore, these results where used as a foundation for choosing the right business strategy and finding suitable potential pilot customers.

The B2B market research was divided into two parts and was primarily obtained from three different information sources; Internet, telephone and direct meetings. Section 12.1 gives a more general view of the market. Section 12.2 investigates more specific potential early pilot customers in detail.

Section 12.3 will look briefly at the results from CityMob's quantitative and qualitative market research towards the end-users.

12.1   B2B Market Research Part One

The first part of the B2B Market Research focused on gathering as much information as possible about city magazines, and thereby find which of the content proviers that fit our business idea best.

12.1.1   Information Search

Through printed magazines and especially the Internet, a lot of information was gathered. The most important information collected was:

- Which city magazines exist
- Target groups for these magazines
- Which content category was normally represented
- Where they had office space
- How they earn money
- Size and structure of city magazine companies

German City Magazine

In Table 12.1 a list of city magazines in the 15 largest cities in Germany is shown, all with 500.000 inhabitants or more. For a more complete list of city magazines in Germany, see Appendix E.

City	Magazines
Berlin	berlinatnight.de, stadtmagazin-berlin, 030 Magazin Berlin, berlinien.de, Frontpage, kulturnews Berlin, Nightlife Berlin, Sergej, Siegessäule, STADTKIND, Tip, zitty, KIEK MAL - die Berliner Kinderzeitung.
Bremen	stadtmagazin-bremen.de,BREMER, Bremborium, Mix, PRINZ Bremen, Stadtus Bremen, port01-CityFlash, Kinderzeitung - das Bremer Familienmagazin, Big, szenenight.de
Dortmund	HEINZ-Magazin, Coolibri
Dresden	PORTPOOL Dresden, DRESDEN NIGHTLIFE, port01-CityFlash, FRIZZ Das Magazin, SAX, Dresdner, PRINZ Dresden, KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt,Blitz!, Stadtus Dresden , DD-INside, eltern, kind and kegel - Familienmagazin für Dresden und Umland
Duisburg	HEINZ-Magazin, der duisburger
Düsseldorf	NRW LIFE, coolibri, Biograph, PRINZ Düsseldorf, Libelle - Stadtmagazin für Leute mit Kindern, Stadtus Düsseldorf, Rhine Magazine, kulturnews Düsseldorf
Essen	HEINZ-Magazin
Frankfurt	Journal Frankfurt, Journal Planer (Beilage der Frankfurter Rundschau), Frankfurt PUR, PRINZ Frankfurt, Strandgut, N!TE, FRIZZ Das Magazin, kulturnews Frankfurt, Kuckuck! - Frankfurter Familienmagazin
Hamburg	Hamburg Aktuell, hamburger-stadtmagazin.de, stadtmagazin-hamburg.de, port01-CityFlash, Hamburg pur, HIER, OXMOX, Piste Hamburg, PRINZ Hamburg, Stadtus Hamburg, Szene Hamburg, kulturnews Hamburg, Bangerang - Stadtmagazin für Familien in Hamburg, UNISCENE - Hamburgs junges Magazin
Hannover	port01-CityFlash, STADTKIND hannovermagazin, Hannover Live, Magascene, Schädelspalter, PRINZ Hannover, Stadtus Hannover, kulturnews Hannover, Hannover Kids - Veranstaltungsmagazin für Kinder und Erwachsene
Köln	StadtRevue (seit 1976), stadtmagazin-koeln, Choices, Einblick, PRINZ Köln (Etablierte Presse), KÄNGURU Stadtmagazin für Familien, Rhine Magazine, Stadtus Köln, kulturnews Köln
Leipzig	SPORTPOOL Leipzig, port01-CityFlash, FRIZZ Das Magazin, KREUZER, Blitz!, PRINZ Leipzig, Stadtus Leipzig, kulturnews Leipzig,KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt
München	stadtmagazin-muenchen.de, Munichx.de, munig.com, muenchen24.info, curt Magazin, Applaus, In München, Puccini, GO Stadtmagazin, PRINZ München, FRISCHLUFT, Nachtagenten, kulturnews München, Kitz Familienmagazin, lessordinary.eu, Haus+Hof Baumagazine.
Nürnberg	curt Magazin (Nürnberg), LottaLeben.net, plärrer, MM MonatsMagazin, PRINZ Nürnberg, Doppelpunkt, Stadtus Nürnberg
Stuttgart	port01 City-Flash, lift, Moritz, Freizeitspiegel, kulturnews Stuttgart, Stadtus Stuttgart, Elternzeitung Luftballon, re.flect

Table 12.1: City magazines and potential customers in the 15 biggest cities in Germany

Target Group:

Most of the city magazines aim their products at the 18-40 year-old age group. It is also a notable trend that the magazines aiming for an average to rather highly educated audience. The common denominator is that the users are living urban lives, trying to always be up to date with the latest happenings and events.
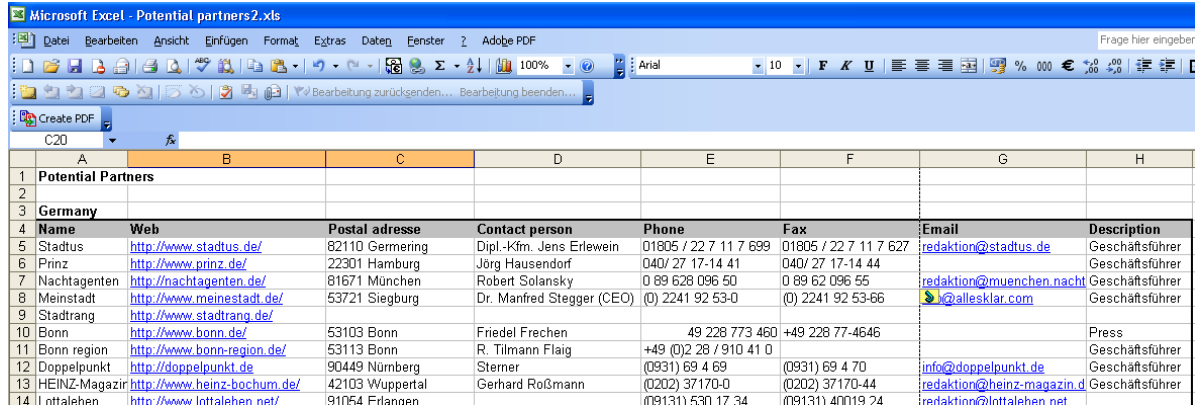
Content normally represented

- **Static:** Restaurants, clubs, bars, cinemas and shops
- **Dynamic:** Events and happenings, such as concerts, festivals and meetings. It is also usual to have user-generated content, community, table reservation to be ranked.
- **External content:** Traffic information, ticket sale, map, route planer etc.

In printed magazines, articles constitute a significant part of the product.

Contact information

To easily be able to get in touch with different potential customers, the contact data for different city magazines was collected in an Excel table, see Figure 12.1

Figure 12.1: Collecting contact information about city magazines

How they earn money

All of the city magazines earn their money from primarily from advertisements; some of them have support from the government, such as Berlin.de and Munchen.de. Most of the city web portals are too small to get their own advertisements, so they have to go through marketing agencies such as WebComi and Netpoint-Media. A price example for commercial is shown in 12.2. In such cases, it is common for the advertisers to receive some extra promotion opportunities, e.g. their restaurant will be on top of the list when users perform a search or appears with a bigger picture.

Some providers, like Ich-will-essen.de in Berlin, also differentiate their customers as "free" and "premium" customers. Premium customers can post in their "today's menu", and pictures of the restaurant. On Berlinatnight.de, the premium customers can post their own events and happenings.

Commercial form	Format	TKP*
Full-Size-Banner	468 x 60	20 €
Super-Banner	728 x 90	30 €
Standard-Skyscraper	120 x 600	40 €
Wide-Skyscraper	160 x 600	45 €
Rectangle	180 x 150	40 €
Medium-Rectangle	300 x 250	50 €
Pop-Up / Pop-Under	variabel	40 €
Layer-Ads (Flash-/DHTML-Layer)	variabel	60 €
Expandable	variabel	70 €
Tandem-Ad	2 Commercial forms	80 €
Wallpaper		Auf Anfrage
Streaming-Ads	variabel	90 €

*TKP: Pro thousend visitor.

Figure 12.2: Price example from BERLIN030.DE

Size and structure of the city magazines

The city magazine industry has mainly three kinds of players;

- "Global" providers cover most of the major cities around the world.
- "Nationwide" providers are nationwide providers. e.g. Germany.
- "Local" providers cover a city or a part of the country, e.g. Munich or Bavaria.

The differences between the magazines is normally that the "global players" are more like yellow pages with only static information such as general contact information, addresses and phone numbers. The "local players", on the other hand, are very good at providing both dynamic and static information. Dynamic information such as special events and happenings is usual. The "nationwide" provide both static or/and dynamic city information.

The city magazines have a small core team, which runs the administrative tasks and consists of mainly technical staff and editors. Their company also has a wide range of information collectors. The cost of running a city information web portal is minimized and is nearly limited to the cost of the employees. If the city magazine appears also in magazine form, the company has the additional cost of printing and distributing the magazine. If they are operating in magazine form, the magazine is normally distributed once or twice a month.

On their web page all information is free of charge, and some of them like the nationwide magazine Prinz, also connects a community to their web page.

12.1.2 Phone Calls

CityMob had phone meeting with six city magazines in Germany and England, in the period of the 6th -14th of February 2007, to increase understanding of the customer. The results of the feedback were, in general, positive.

The city magazines that were contacted were:

Germany: Lottaleben, Prinz and Starnberger See

England: VisitManchester, Brigthton.co.uk and Liverpool city guide

A summery of the survey

Phone call context:

CityMob presented themselves as students doing research for Master thesis about city information on mobile. The city magazines that were contacted were not in our main target group, in order to avoid conflicts with future interest.

The main questions asked:

- What do you think about getting your city content into mobile phones?
- Would your company be interessted in a collaboration with a mobile software company to get your content on mobiles?
- Explanation of the scale model: Would you want to take part in this kind of city mobile content network?
- Would you be willing to pay for such a service?

Results:

- 4 of 6 of the companies had not thought about taking their content to mobiles
- 5 of 6 of the companies were positive about a collaboration in which they would provide content and CityMob would make the application
- 1 of 6 of the companies would be interested in having a user survey about the mobile application on their web page
- None of the city magazines CityMob contacted did now the difference between using an Java application and WAP to access information through mobile phones
- One of the city magazines, was already considering their own mobile solution

12.1.3   Direct Meetings

CityMob obtained personal meetings with three CEO's from city content web portals in Germany; Lottaleben (`www.lottaleben.net`), Ich-Will- Essen (`www.ich-will-essen.de`) and Munichx (`www.Munichx.de.`).

These meetings addressed of the following points:

- The needs of the city magazines
- How they earn money
- Their attitude towards mobile phones
- Their willingness to share their content
- How the technical infrastructure for these providers are

Sketches of the different city magazines:

Lottaleben

Lottaleben is operating in three cities close to Munich: Nürnberg, Erlangen and Fürth. CityMob met the managing director of Lottaleben.net, Andreas Ochs in Nürnberg the 13. March 2007.

Ich will essen

In Berlin, CityMob had a meeting with Ich-will-essen.de the 16. March 2007. IWE is a resturant guide for Germany, and IWE showed huge interest in CityMob's technology, especially ideas about location based service combined with their service.

Munichx

Is a city guide in Munich, only operating on web and would be CityMob's most preferred collaboration partner as a pilot customer. CityMob got an introduction meeting with Munichx and their CEO, Phillip Gasteiger, 4th of May 2007, read more in Section 15.3.

Background

City information distribution is a lucrative market in a country with a lot of big cities. In the 1990s, it was the magazine that dominated and the introduction of computers was, in general, slow in Germany. The printed magazine had a very strong position in Germany, as it was nearly the only medium people read to get "city information". Recently, however, the Web has been taking over more and more of the market, due to a younger generation which is used to computers and gathering information on the Internet. Printed magazines are surprisingly not interested in competing on the Web, since they believe that this will harm their own printed magazine business. Since the Internet is gaining in popularity, the competition is getting harder and the need for special functions and features to differentiate companies' products from others' is increasing.

How do they earn money

Their main income comes from advertisements; two of the three companies had a cooperation deal with a marketing agency that provides them with advertisers, and the commercial income is then split between the two parties. However, the companies are also contacted by firms wanting to advertise on the page or in the magazine. The last firm provided their own advertisements by contacting different firms directly or receiving contact from firms.

Their attitude towards mobile phones

All three city magazines were very positive about collaboration, since they have not been thinking about the idea of also expanding their business to mobiles.

Since their income comes from advertisements, generating users and clicks on the page is important to be attractive for the advertisers and increase income. That is why to differentiate their product with a mobile application would be a good way to improve the product towards the users and get a competitive advantage on the market. All three CEO's said they think the mobile solution would be something "hip" and something "new" that people definately would use and find useful, possibly even paying for the service.

Their willingness to share their content

All three CEO's were presented with three different principles of ways to get content from there database to the end-users on the application. See Figure 12.3, Figure 12.4 and Figure 12.5. The most preferred option was the third option in which CityMob's servers act as an intermediary between the content and the application, getting the information, through e.g. SQL-query, adopting the content to the right format, and sending it to the mobile application. Also, two of the three companies said that they would let CityMob duplicate their database, as long as they withheld all of the rights for the content.
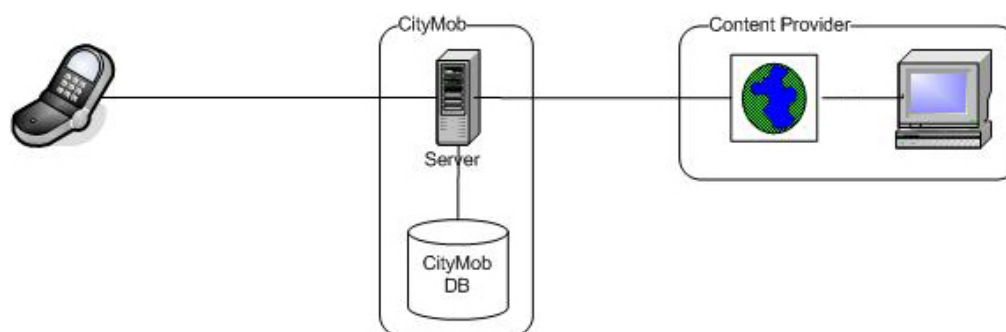
Figure 12.3: Alternative 1. CityMob store all the city content from the city magazine, by monitoring the customer web page.
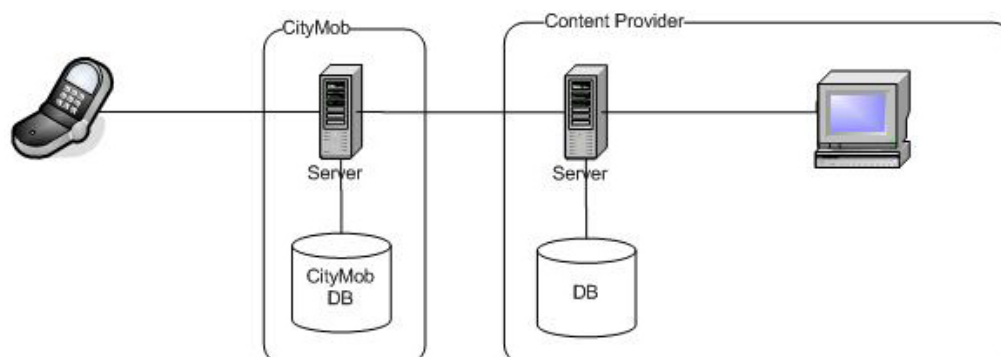
Figure 12.4: Alternative 2. CityMob have a connection to the customer server, hence data would be redundant on the two servers.
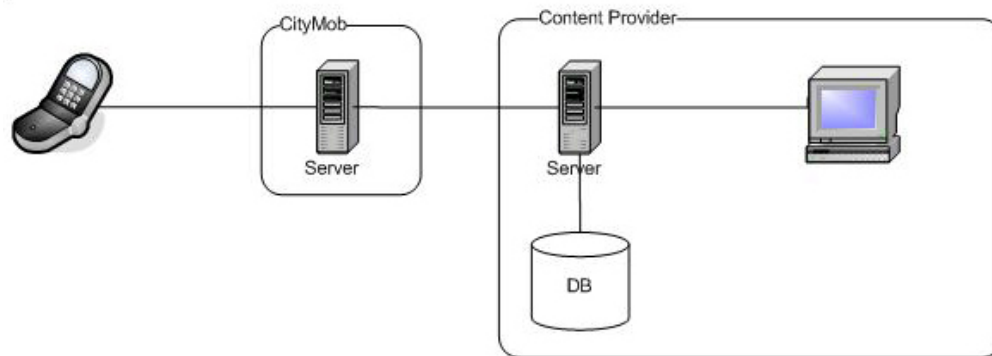
Figure 12.5: CityMob server is only acting as a translator, where the request from users will be done via CityMob's server to the customer database. No, content data from customer will be stored on CityMob's servers.

Technical infrastructure for city magazines

All of city magazines where familiar with web services [1], which make it very easy for CityMob to retrieve information and to communicate with the different servers from the city magazines.

12.1.4 Discussion and Conclusion

The first part of the customer research had the aim of collecting as much information as possible about the potential customer and, based on this findings, on finding the right business strategy.

Three different business strategies arose:

- Strategy 1: Many local city magazines
- Strategy 2: Nationwide city magazine
- Strategy 3: Local provider and then national provider

Strategy 1

This strategy would be to collaborate with one of the local city magazines in Germany, such as Munichx and then scale to other cities.

- Step 1: Start developing the product with a small city magazine
- Step 2: Continue to other major cities in Germany
- Step 3: Continue to other major cities in the world

Strategy 2

This strategy implies approaching nationwide city magazines around the globe, with Germany as the starting point. For the initialization of the project, this requires collaboration with a nationwide city magazine, and development of a prototype together.

- Step 1: Collaboration with a nationwide city magazine in Germany (e.g. Stadtus or Prinz)
- Step 2: Approach other nationwide city magazines in Europe
- Step 3: Approach other nationwide city magazines around the globe

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[1] Web service is a software system designed to support interoperable Machine to Machine interaction over a network. In our case communication between the customer server and our server

Strategy 3

Because of the higher level of acceptance by a nationwide city magazine, it was considered an option to develop a prototype together with a smaller city magazine and to have this prototype serve as a reference product to present to nationwide city magazines at a later stage.

- Step 1: This strategy includes the development of a customized product for a small city magazine e.g. Munichx and InMünchen. This collaboration would be very low priced and the payment would be in experience and a working application.
- Step 2: Take our developed prototype to a nationwide city information provider and suggest collaboration with them.
- Step 3: Expand to other countries.

The selection for business strategy

After the team meetings, strategy 1 was chosen. Since there are many small-medium city magazines, all of these companies have a need to differentiate their product from their competitors in order to survive. Moreover, the quality of these city magazines has been proven to be that of a higher quality, especially with event and happening information. Also, in some cases, the trust between the user and the local city magazines was higher and, therefore, more popular, as shown in the market research aimed towards user in Section 12.3.

12.2   B2B Market Research Part Two

This section has the intention of finding the right pilot customer for CityMob, following the business strategy agreed on in Section 12.1.4. The research covers research done of local city magazines in Berlin and Munich, choosen from the information provided in part one, Section 12.1. These cities were considered to be the most interesting places to launch the application, due to the large number of events and of young citizens.

Three alternatives in Berlin and Munich were chosen from the first part of the research for further investigation. These alternatives where the most preferred alternatives for our business idea, mostly because of their:

- Significant market share
- Their high quality content
- Target group.

Furthermore, because of their amount of content in our preferred categories: Restaurants, Clubs, Cinemas, Events, Community, Map, Ranking, User Generated Content, E-ticket, Magazine and Route Planning [1].

Munich

In Munich, it exist several of potential customers, which was identified in market research part one, however from this research it was decided that Munichx, Munig and Nachtagenten would be the best considering our business idea.

Provider facts Munich			
Provider name / Attribute	**Munich-X**	**Nachtagenten**	**Munig**
Link	http://www.munichx.de/	http://www.nachtagenten.de	http://www.munig.com/
Geographical coverage	Munich	8 cities	Munich
Category*	Re, Cl, Ci, Ev, M, Ra, E-t, RP	Cl, Ci, Co, Ra, Ev, E-t	Re, Cl, Ci, Ev, M, Ra, E-t, RP

Figure 12.6: Potential customers in Munich

Nachtagenten

Nachtagenten mainly have weekly reports regarding the hottest parties in 6 German cities, but has also articles and information about cinema, shopping, lifestyle guide and news. The web portal has a community with functions such as uploading of party pictures, guest book, chat and mail function [29].

Media data [29]:

- Page impressions per month: 18.300.000
- Visits per month 1.300.000
- Unique Users 440.000
- Email list 53.400

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[1]Restaurants(Re), Clubs (Cl), Cinemas (Ci), Events (Ev), Community (Co), Map (M), Ranking (Ra), User Generated Content (UGC), E-ticket (E-t), Magazine (Mag), Route Planning (RP)
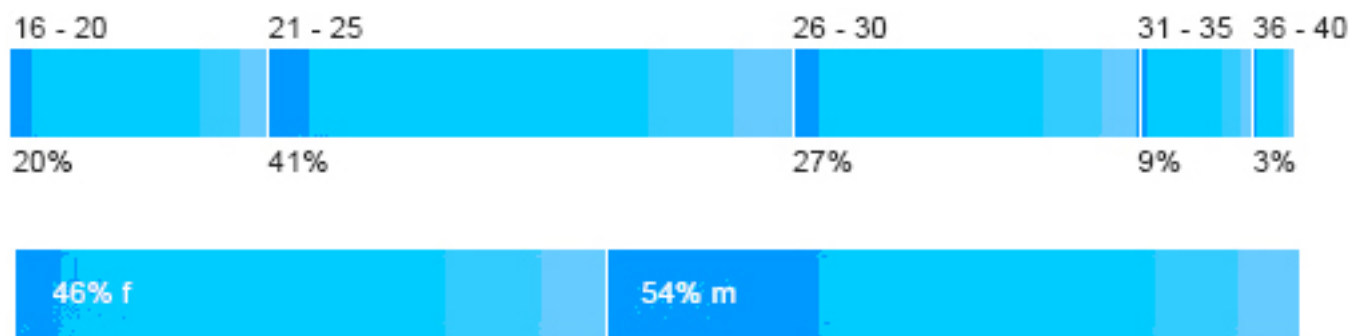
Figure 12.7: Nachtagenten, "female and male share" and "percentage of user pro age"

Munichx

The online city magazine Munichx.de counts daily over 14.000 readers. Munichx has information of events and happenings such as meetings, concerts and parties and offer the readers one of the most detailed meeting calendars in Munich. Also more static information about restaurants, bars, and clubs is provided.

Media data:

- Page impressions per month: 2.200.000
- Visits per month: 500.000
- Unique Users: 184.000

Munig

Munig.com is an online city magazine for Munich, with cinemas and current cinema programs, overview over the popular parties and concerts (with map advance booking) as well as many other things such as e.g. property market, job exchange, shopping, hotels.

Media data:

- Page impressions per month 1.600.000
- Visits per month 200.000
- Unique Users 80.000

12.2.1 Berlin

Provider facts			
Provider name / Attribute	**Berlin at Night**	**Berlin 030**	**Zitty**
Link	http://www.berlinatnight.de	http://www.berlin030.de	http://www.zitty.com/
Geographical coverage	Berlin	Berlin	Berlin
Category	Re, Cl, Ci, Ev, M, Ra, E-t, RP	Re, Cl, Ci, Ev, M, Ra, RP, Mag	Re, Cl, Ci, Ev, M, Ra, RP, Mag

Figure 12.8: Potential customers in Berlin

Berlinatnight.de

berlinatnight.de targets 20 - 40- year urban people event hoppers in Berlin. The magazine has information about bars, clubs, restaurants, Cafés, galleries and detailed descriptions and information of the different locations. Registered event holders can publish and update independently and free of charge their happenings on berlinatnight.de.

Target Group:

- 20-40 years old people, above average educated
- Mitten to higher income
- Active and well updated
- Free time oriented
- High interest in concerts, lifestyle and culture
- Early Adopters

Effective reach: 365.920 Page-Impressions

Berlin 030

The city magazine [030] targets 19 to 29- year old event hoppers in Berlin. The magazine has information and articles about cinema, party, trend haven, new media and mode. Lottery, news letter service and WAP solution increase attractiveness for the information portal.

Target Group:

- 19-29 year old people, above average educated
- Mitten to higher income
- Active and well updated
- Free time oriented
- High interest in travelling, sports, lifestyle and leisure activities
- Interest in books, CD, movies, TV, magazines

Effective reach: 1.413.952 Page-Impressions pro month and with 2.548 Subscribers from newsletters.

Zitty

Zitty is a printed magazine published every 14 days, but also exsisting on web. Apart from reports from articles about Berlin and the surrounding countryside, it

offers articles and criticism of current events, like concerts, plays, exhibitions as well as recommendations of restaurants, trips, bars and discos.

Sold magazine: 55.047 Exemplars (IVW Q2/2006[1])

Readers: 0,32 M (Q2/2005, Berlin-Connection)

12.2.2 Discussion and Conclusion

The second part of the market research had the intention of finding the right pilot customer for CityMob. Reserach was performed on local city magazines in Berlin and Munich. These cities were considered to be the most interesting places to launch the application, due to the large amount of events.

Even with Berlin as the capital of Germany with a lot of major events, Munich was regarded as a better option for realising the prototype. The main reason for this was the CityMob's contact network in Munich and their knowledge about the city.

From the market research, Munichx was decided as the best option as a pilot customer since their web page reflects the same information that the CityMob team wants to include in the mobile application. Munichx is also well known among the citizens of Munich and had, e.g., in October 2006, 456.822 unique visitors and 1.647.345 page impressions on their web page.

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[1]Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern

12.3   Market Research User

The user surveys was conducted by all of the CityMob team members and was important for both the business plan and for the prototype design. This section presents the results of the market research. For additional detail, see the complementing Master thesis [1].

The goal of the quantitative survey in Section 12.3.1 was to establish a more general view of users mobile phone habits, and to find correlations between these habits and the use of city guides.

The purpose of the qualitative survey in Section 12.3.2 was to identify needs, to understand the market CityMob is trying to enter, and get an idea of what our focus areas should and should not be while developing a new mobile service.

12.3.1   Quantitative Market Research

The Quantitative market survey is based on the results of 85 answers. All the asked were between 16 and 35 years of age. 35% of the asked were men and 65% women. The survey had two parts, were the first was technology oriented and the second focused on the use of city guides.

Main results

Almost all of the asked had at least what CityMob can call a typical user pattern. This includes calling and text messaging. In addition about 35% of the users had downloaded some sort of content to their phones, this being a low number considering 77% of them knew how to do it.

65% of the participants considered their phone to be advanced, this being a natural effect of that most new phones are advanced. Even so they were not familiar terms like 3G (only 20% were). This is probably a consequence of a technology push, and a users want to have all sorts of functions even though they don't always need them. This is confirmed by the fact that even though the participants knew their phones capabilities (85% claimed to have explored the functionality), most of them were not used.

An interesting fact unveild by this servey, is that most users are sceptic to the use of Internet with their mobile (55% found it too expensive). Price is central here, but at

the same time most users admit that they don't know what the prices are (only 15% state that they know the prices). Operators are constantly changing their price model, and it seems the customers are left confused. In addition the prices are often not promoted.

The city magazine part of the survey revealed some interesting points. This part focused not only on magazines and web pages that the city magazines use, but also on the newspapers in the Munich district. Many (56%) of the participants revealed that they rather read the city magazines than newspapers to orient themselves on events. This shows the popularity of the city magazines in Munich, especially among younger people. The Internet version of the magazines was not as much used as the magazine, but the participants that knew of them all preferred the city magazines to the newspapers. It can seem as though the web page is complimentary to the magazine. In other words, if you know and use the magazine you will also use its web page. This of course does not apply to the city magazines that only are available on the net.

A total of 70% stated that they often used Internet when they planned their weekends. And almost all the participants (92%) had used the Net for buying tickets.

The survey showed an indifference to the recommendations (50% found them neither useful nor unuseful) in magazines and newspapers, but at the same time 61% admitted that they used them to find a restaurant. Recommendations from friends seemed to be more normal, with 66% stating these to be valuable.

A strong correlation was found between technology interest, and Internet use in order to find events.

12.3.2 Qualitative Market Research

For the qualitative market research 17 people in the age 21 to 32 years old and with an average of 24 years, were interviewed. The interviews lasted a little less than 30 minutes.

Main results

From the categories of events, 4 were noteably more popular than the others. These were Bars, Parties, Cinema, and Nightclubs. Furthermore, Concerts, Shopping, Restaurants, and Sports, were categories of events that were just above or beneath the average interest rank. The servey shows that when deciding where to go out,

their friends opinion matters a lot. Out of 17 persons interviewed, 8 persons said they had other sources of information to find out where to go out, such as the Internet, Stadt magazines, newspapers, posters, and flyers. Of other categories of events, theme parks, subway and train information, and flight info were mentioned; subway information was mentioned several times. Music was also mentioned, such as information related to a specific band.

The most mentioned feature was a map function and a navigation tool. Another function that seemed popular is ticket ordering through the mobile phone; then comes ranking by a critic and user ranking, and finally user community. Event notification was mentioned as an interesting feature as well as access to highly dynamic information.

Factors affecting the decision of downloading the application were content quality, the ease of use of the application, the price and the fact that the application should be easy to download. The price did not seem to be a real barrier. Most of the persons asked would not mind paying 1 Euro for the service, but the idea of a subscription did not really fall into taste.

The majority of the persons answered hat they would consider downloading the application. Moreover, 4 answered they would not use the service, and 12 answered they would.

12.4 Financing

This chapter will cover some possible ways to raise money for the start-up business, from the perspective of CityMob's management situation as Norwegian students trying to start up a company in Germany.

In order to start a mobile content business, minimum start capital is needed. In most cases, the main expenses would be personal expenses [1], legal expenses [2], equipment[3] and office space.

As shown in this chapter, three options for raising money would be preferred in the situation of CityMob's management team: external investment, internal investment and funding.

12.4.1 External Innvestor

The external investor would be the last preferred option since the members of CityMob want to own and run the company themselves. Also, the value of the company is considered to be low, hence an investor who invested e.g. 500.000 Euro would nearly own the whole company. However, it is not a secret that venture capital would boost the company and increase the possibility for success and fast growth. If an investor were to enter, it has already been agreed among the team members that all members will receive an equal lower share in the company with regards to their existing share. A preferred investor would be a person with knowledge and contacts in the field of mobile business, a person who will contribute to the company and not only wait on the side line, expecting his/her investment to grow. Investment from German investors would be preferred, since the company's base is in Munich.

Venture Capital

Before dotcom wave in 2001 deleted thousands of new started IT-companies, was the role of tomb in Silicon Valley in USA that 93 present of new started companies went bankrupt, and the rest went sky high. This made it still very interesting for venture capitalists to invest in IT- companies. VC firms act as mediators between investors and start-ups, collecting and investing funds into risky but promising new ventures.

Characteristics of VC [10]:

- Equity (not debt); hence, shares risk of the entrepreneur

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[1]rent, food and transportation
[2]legal entity, lawyer (contract writer), accountant, tax number etc.
[3]computers, servers, etc.

- Duration until exit: about 5-10 years (longer these days)
- Typically no (bank-type) securities
- No periodic payments of dividends or interest; instead, venture capitalist shares in the company's value increase
- Comes typically with (some) management support (smart capital)

A venture capitalist (VC) is a person who makes such investments.
A venture capital fund is a normally an investment partnership.

During the last decades many important innovations have taken place in start-up firms financed by venture capital. Well known examples of firms in the ICT business are Apple, Intel and Microsoft.

Venture Capital firms:

- Wellington's partners: e.g., Alando (ebay Germany), Ciao.com
- Earliybird: e.g., Conject, dooyoo, Tipp24.de,
- AtlasVenture: e.g., GoIndustry,
- Datango 3i: 83 portfolio companies in D. E.g.: Vocatus, Interhyp.
- Apax partners: e.g., Lastminute, Medscape
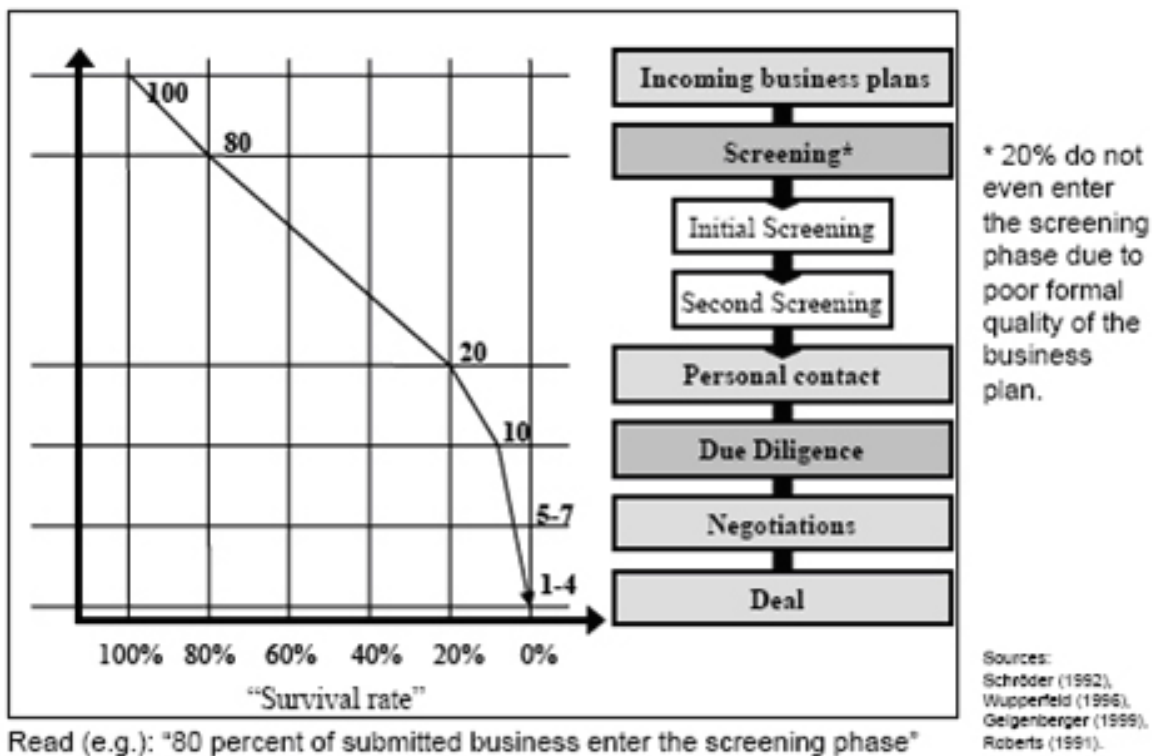
Figure 12.9: Steps of a VC evaluation process

Corporate Venture Capital

Large firms try in various ways to emulate the strengths of start-ups. One way is corporate venturing.

The definition of "Corporate venture" a project that:

- Involves an activity new to the organization
- Is initiated or conducted internally (but may originate externally)
- Involves significantly higher risk of failure or large losses than the organization's base business
- Is characterized by greater uncertainty than the base business
- Will be managed separately at some time during its life
- Is undertaken for the purpose of increasing sales, profit, productivity or quality.

Corporate Venture Capital (CVC) denotes:

- Investments by large corporations into start-ups (which may come from inside or outside the company)
- That is performed by dedicated CVC units within the corporations
- And are direct, i.e., not via a fund managed by a third party.

Well-known examples of CVC:

- IT/Telecom: Intel, Nokia, Lucent
- Software: Microsoft
- Health care: Johnson and Johnson, Merck

In Germany:

- T-Telematik Venture Holding GmbH (1997)
- DaimlerChrysler Venture GmbH (1997)
- Siemens Venture Capital GmbH (1999).

Possible Venture Capital help in Norway

CityMob got in touch with several of investors and investors funds through the "Stipenordningen" competition. The most interesting will be mentioned here, in short:

Andreas Putz, representing Leiv Eriksson Nyskapning (LEN)
LEN is an incubator center that helps start-ups and nurtures good ideas as an investor and also helps with finding other suitable investors [50].

They also help with:

- Developing business concepts
- Consulting
- Coursing of the management team
- Infrastructure, such as office space

Ann-Tove Kongsnes, representing Proventure.
ProVenture Seed AS was established in Trondheim in Autumn 2006 and operates throughout the country. The venture fund has a capital base of 335 million NOK and is owned by 28 industrial and financial investors, both national and international. The company has a horizon on 12 years, where only the first seven years is open for first-time-investments. The fund is aiming to have 30 companies in their project portfolio and to develop these companies to be growing, international companies [5].

ProVenture takes a 20%-30% share in the companies; they are not only contributing with money, but will also be a member of the board and is an active contributer to the project, with their competence, knowledge and resources [5].

Jostein Vik representing Viking Venture.
Viking Venture started in 2001 with 230 million NOK and is one of the leading technology-focused venture funds in Norway with 600 million NOK under their management today. The funds focus on investments within ICT, Energy and Life Science. Viking Venture typically invests in companies that have passed the seed phase and are ready for the commercialization phase. The fund is a very active owner with a substantial share in the portfolio companies [66].

Viking Venture will be a proactive owner with significant shareholding in its portfolio companies. There is a typical investment period of 3-5 years. Viking Venture invests up to 50 million in a project and their share in the company will depend on the investment amount, but they are normally a shareholder of 20-50% [66].

12.4.2   Business Angels

Venture capitalists normally have strict equipment for their investments, hence an alternative for entrepreneurs is to seek funding from business angel investors, who may be more willing to invest in highly risky projects.

A business angel is usually an experienced entrepreneur or a leading employee who contributes to companies due to his/her professional activity experience and contacts. With their capital, know-how and contacts, business angels support existence founders with the establishment of their enterprise. Business angels invest mostly in start-ups in the high-growth branches such as IT, Multimedia and Life Science. They are ready to let their know-how and contacts flow into the enterprises
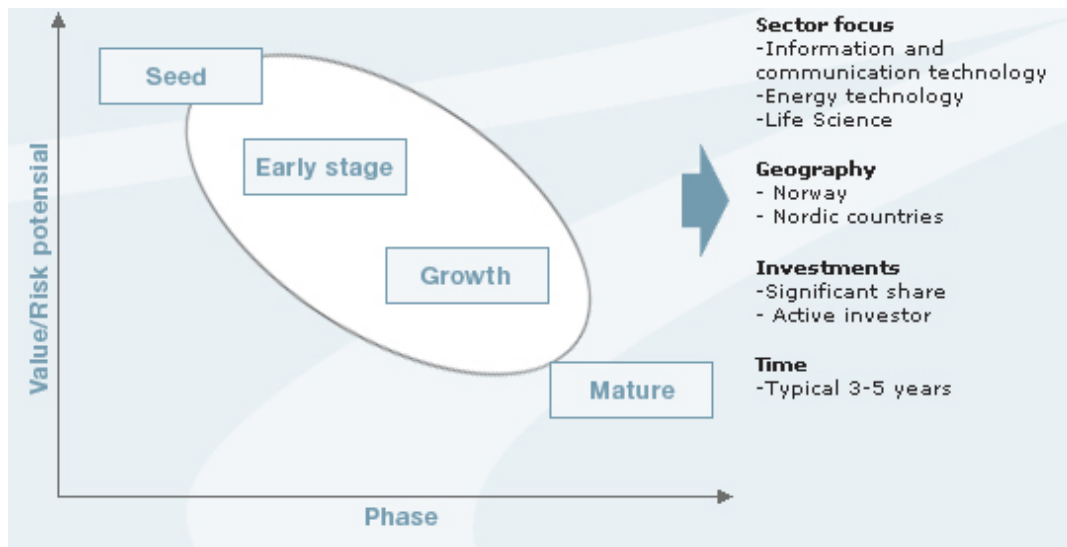
Figure 12.10: Investment Focus, Viking Venture [66]

as for example a coach. Therefore one also calls this type of capital "intelligent" capital.

Business angels are normally organized in networks. In Germany, there are approximately 40 networks with often regional coverage. These networks serve as a place for capital-searching enterprises and manufacturers to get in touch with the suitable business angel. The basic condition for a first contact is usually the business plan or a presentation.

12.4.3 Funding

Founding is a good way for student start-ups to get a kick-start and to help get over the early economic boundaries that the company is facing. Normally, there are several different scholarships available at good technical universities. This section will look more closely at some of the opportunities in regards to NTNU and TUM.

Possibilities at NTNU:

There are different ways to get money through founding for good ideas and start-ups, especially around the research environment at NTNU, which is the center for technical innovation in Norway. This section will take a closer look at some of the possibilities that CityMob applied for.

Stipendordningen
Is a small version of Venture Cup and is founding that is given to Master's thesis and/or PhD projects at the Norwegian University of Technology and Science by the Norwegian government represented by "Norsk Forskningsråd", to promote innovation

among Master and PhD students at NTNU and help to commercialize their work
and ideas.

The NTNU Entrepreneurship Center (NEC), represented by Magnus Hakvåg, was in
charge of the founding process. The "Stipendordningen" stipend is given to 10
people. The applicants participate in an internal competition, and, based on their
business plan and a presentation for a jury, the four best contributions will advance
to the final round. CityMob won the competition with their business plan and a
convincing presentation in Trondheim, in which also a member from Munich was
represented. The first price was an additional 25,000 kr. CityMob used their first
10,000 to get professional help to write a good business plan, to pay for translating
costs, a web portal, travelling expenses and other administrative costs. The
additional 25.000 kr will be invested in computer equipment, such as servers.

CityMob also got their first media reference, with an article in the university
newspaper see Figure 12.11.

The jury members at Stipendordningen:

- Nils Kristian Nakstad, investor and board member of the business
  tradeorganisation in trondheim.

- Bård Benum, CEO Vital

- Gøran Steffensen, Deputy Head Sparebanken midt-Norge

- Trond Soligard, General Manager, business development Reinertsen engineering

Ideefondet
Ideefondet supports development project as a link between NTNU and the industry.

Idefondet is an establishment which connects industry to the research environment
at NTNU by financing projects in close relationship with a network of industry
firms, the leading research environment at NTNU and SMB-companies. Behind
Ideefondet are mainly 12 leading industries, who contribute with financial support,
knowledge and resources. Among these are: StatoilHydro, ConocoPhillips, Shell and
Aker Kværner [32].

Idefondet is given to support idea projects and research projects with
commercialization potential, which have their roots from NTNU. Ideefondet
supports ideas on an early stadium and helps developing the idea so that it can be
presented for sponsors, companies and potential partners [32].

The maximum amount of support is 100 000 NOK.

CityMob got very positive feedback on their application and received a supporting amount of 100.000 NOK.

Venture Cup
Venture Cup is a business plan competition that helps students, researchers and others to take their business idea from concept to actual start-up. Venture Cup motivates participants to develop their ideas with hands-on coaching and feedback as well as inspirational events and workshops. Venture Cup has a large network of entrepreneurs, venture capitalists and professionals within a wide range of fields devoted to making business ideas become a reality. CityMob applied for participation in Venture Cup, but due to the company location, was the application denied. [20].

12.4.4 Possibilities at TUM:

Exist-SEED
Exit-SEED is start-up help for technology oriented companies, and is given as founding in the early phase, to start-ups in the region of Bavaria in Germany.

The terms

- The entrepreneur team and idea are still in the earliest phases; no company should have been founded yet.
- The idea have to be technology oriented and innovative and has commerializing potential.

If granted, personal costs and tangible needs will be covered for the entrepreneur team of three persons for 1 year:

- Personal cost for research workers max 30.000 euro, for students 10.000 euro.
- For consultancy and tangible means for singel entrepenure max 13.000 euro, for teams up to 20.000 euro.

CityMob applied for this stipend in the end of June; however, if CityMob receives the funding, it will start from 1. October 2007. CityMob also received a mentor for the project in regards to the application through the a professor in the Department of Computer Science at TUM, Professor Schlichter.

Other funding possibilities:

Innovation Norway

Innovation Norway is a state owned company and is replacment of four earlier governmental organisations: the Norwegian Tourism Board, the Norwegian Trade Council, the Norwegian Industrial and Regional Development Fund (SND) and the Government Consultative Office for Investors (SVO) in 1994. Innovation Norway promotes nationwide development, both in business development and national economy, but also supports innovation, internationalisation and promotion of Norway. Innovation Norway is represented with offices in 30 different countries around the globe.

CityMob applied for help from Innovation Norway through "advising for inventors" VFO (in norwegian: Veiledning for Oppfinnere), in the beginning of May.

omega, men det lot seg ikke gjøre på nett.

I toalettnød? Sjekk mobilen!

Vo måtte dele sin førsteplass med en

LYSE HODER som godt kan være fremtidige bedriftsledere: Svein-Tore Landsverk (t.v.) fra Sunnmøre og Vidar Slåtten, Sogn og Fjordane, representerer CityMob, Marikken Høiseth, Trondheim, kaller sin business Teglelement, og Tangh Van Vo fra Askim er i startgropa med VoCell.

gruppe på fire master- og doktorgradsstudenter som er i ferd med å etablere firmaet CityMob. De kommer fra telemiljøet på IME-fakultetet, og deres ide er å utvide bruksområdet for mobiltelefonen, slik at den blir mottagelig for informasjon om det området den befinner seg i.

Kontekstsensitiv er uttrykket de benytter for å beskrive dette, og det betyr at hvis du er på besøk i en fremmed by, vil du kunne få ned automatisk på din mobil informasjon om restauranter og severdigheter i det området du befinner deg.

Gruppen arbeider med to typer tjenester, en betalt og en gratis. For gratistjenensten er det leveandører av tjenester som betaler for å bli lagt inn i systemet, mens der du selv betaler får du med offentlig tilleggsinformasjon som bussruter,

Renessanse for klassisk byggemateriale?

Marikken Høiseth kommer fra Industriell design, og har i sin hovedoppgave sett på nye anvendelsesområder for det klassiske byggematerialet tegl.

FAKTA

PENGER I KØ

Stipendutdelingen er et tiltak betalt av Forskningsrådet og administreres fra NTNU senter for entreprenørskap. Ti studenter med gode ideer får 10.000 kroner hver, og målet er å "røyke ut" ideer ved master- og doktoroppgaver med potensial for kommersialisering. Disse ti konkurrer så i en grand finale der tre premieres.

Flere selskaper som gir finansiell støtte, enten i form av stipend eller som investering, var til stede ved stipendutdelingen. Alle var tydeligvis interessert i å følge opp de spirende ideene som ble presentert, for det var en hissig utveksling av visittkort under den etterfølgende lunsjen.

Her er noen av dem som støtter unge gründere:

• Idefondet for NTNU: Kan gi inntil 100.000 i stipendstøtte. Årlig deles ut 5 mill kr og det er ikke krav om ejerandel

Figure 12.11: NTNU university newspaper 2.5.07

12.5   CeBIT

CeBIT (Centrum der Büro- und Informationstechnik; German for "Centre of Office and Information Technology".) is one of the biggest information technology exhibitions in the world and is held in Hanover, Germany. Each year, important companies launch their new inventions at CeBIT. The conference serves as a window to the newest and upcoming trends. This year, it was held from 15.3 -21.3, with 6,153 exhibitors from 77 different countries. [15]

As described in Chapter11, CityMob is dependant on several different service companies, like payment systems, the map provider, the LBS provider, mobile operators, content providers and other collaboration partners, see Section, CeBIT was considered to be an excellent venue in order to get to know the market and maybe establishing contact with other companies.

This year, the conference featured an overall attendance of approximately 480,000; an increase of over 10 percent as compared with 2006. In 2007, the event deals that were conducted were estimated to be worth around 11 billion Euros and a rich array of innovations geared to business users, the public sector, prosumers and consumers.

CeBIT 2007 also had the most comprehensive and enriching program of conferences and seminars in the event's history.

The CityMob team attended CeBIT from 16-18 March 2007, and got in touch with several companies relevant for MyCityGuide. The contact and information obtained at CeBIT was impressive, since all of the important service providers in the different areas were present. Through CeBIT, CityMob established personal contact with potential partners and got answers to many questions which would have taken a lot of time and effort if it was done otherwise.

Some of the companies that CityMob met with at Cebit:

Map providers:

- TeleAtlas: Al Cooley, Director
- NavTeq: Marina Stotz, Marketing Specialist Europe
- PTV: Kristina Stifter, Director Corporate Communications
- Mappy: Christian Valentin, International Sales Manager

Mobile operators:

- T-Mobile; Patrick Meisberger, Senior Investment Manager, T-Online Venture Fund
- O2: Tanja Wallarabenstein, Head of Infotainment Product Markting Consumer, New Business and Product Marketing
- O2: Marc Schammo, Business Development, Wholesale and Strategic Partnership

LBS service providers:

- Ic3s: Oliver Sträter, Marketing Director.
- Dialogs: Stephan Neumann, Team Remote Access

Payment systems:

- Cyberplat: Vladimir V. Kurznetsov, Executive Director

Others:

- TrendOne: Nils Müller, CEO
- Handago: Yusuf Erkan, International Business Development

Part IV

Results

Business Plan

13.1 Executive Summary

Due to the high living standard in the industrial nations, the spending on leisure activities is very high. The youth generation of these countries is therefore often called the fun generation, "young people who enjoys life to the maximum". This results in an always high demand for current leisure information. The fun generation has to be updated with the newest clubs and the hottest events and happenings in their vicinity. Therefore it exist today, a numerous of magazines and/or Internet pages which inform about events and locations (bars, clubs, restaurants) in the larger cities. The planning of the leisure activities for the younger generation differ extremely from the former ones. It is no longer planned in advanced, but when and where to go is spontaneously decided. The young generation wants not to commit themselves, but keep themselves open to the different options. Since this generation grows up in a digital age, internet and mobile services is used on a daily basis for the information and organization of their everyday life.

For this lifestyle, MyCityGuide, the mobile phone application from CityMob, offers the perfect solution for the end-users. The client offers the users comfortably by mobile phone, independently from time and place, information about events and locations in the vicinity. Important service function of MyCityGuide are current information about certain locations (for example today's menu from restaurants), representation of information on a city map, personal timetable information for travel with the public transport, automatic positioning of own location as well as a friend locator, which indicate the location of friends. Beyond that, the application offers a guideline assistance by means of user generated content, for example

restaurants can be evaluate with a user ranking. In order to get the necessary content for the MyCityGuide application, partnerships between city magazines and CityMob in the respective cities need to be established.

The advantages for both customer groups - final users and the city magazines - are obvious. The users can whenever and wherever they are, always access current city information. The city magazines however can win new customers due to the additional distribution channel and obtain further incomes.

Since the business model, with co-operation with the local city magazines on mobile phone, is completely new, it is still no direct competitors to CityMob. Nevertheless, there are products like "Google Maps Mobile" or "MyCityMate", which are active on the market already with similar services for the end-user.

The target group of CityMob are, on one hand, the city magazines in the large cities of Germany, on the other hand, their readers of these magazines. In each large city of Germany there are at least two large city magazines, whose internet pages are visited on the average by about 100,000 users a month. In order to get a sufficiently large customer group fast, partnerships with one of these city magazines in the fifteen to twenty largest German cities are to be accomplished in the first three years. From this, it has been calculated that the market size is up to four million final users and forty city magazines [2].

CityMob is also dependent of third part service providers, as well as other mobile operators and content providers which must be included into the business model.

The founder team of CityMob sees itself well positioned to its challenges. The managing director finished his master at the renowned Norwegian University of Technology and Science as well as at the Technical University of Munich within the field of communications technology and economics. With his earlier occupation and practical activities within the field of mobile applications and contents, he has collected valuable experiences and contacts within the industry. Also, the three other initial members, Jan Sindre Isene, Axel Lefebure and Håkon Abrahamsen, which have the technical responsibility for the development of the CityMob application, finished their master degree at the Norwegian University of Technology and Science as well as in the Technical University of Munich. They have participated in numerous of technical projects.

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[2]For detailed calculation see external appendix

In the first three years the follow income and loss has been forecasted, see Figure 13.1:

Income and Loss Forecast
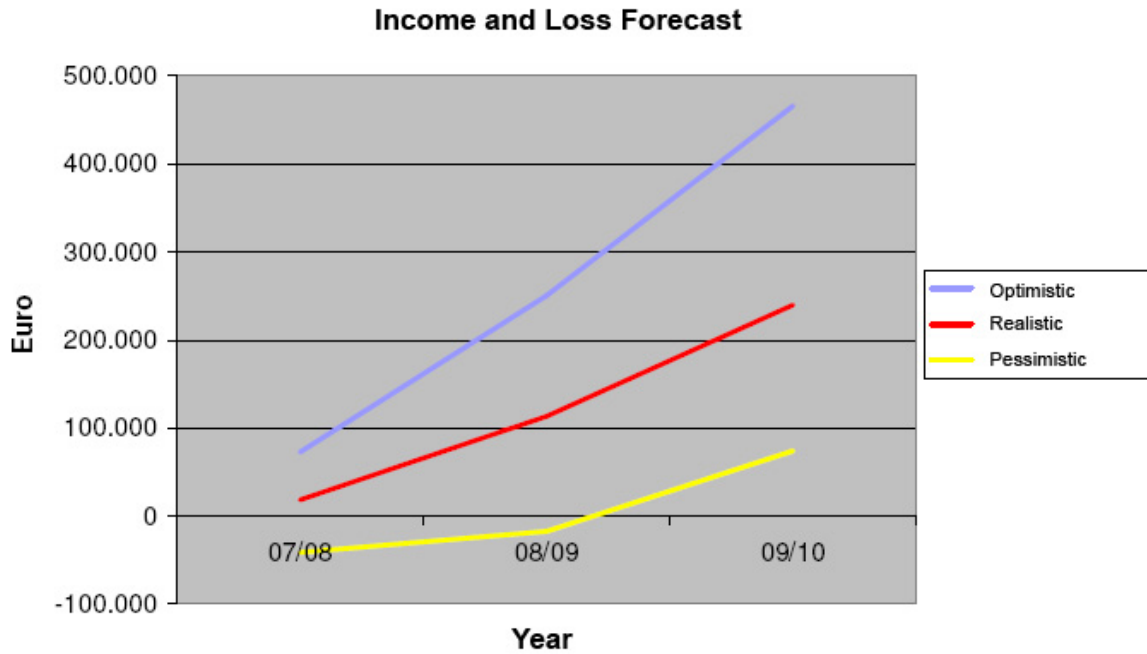
Figure 13.1: Profit and Loss

Figure 13.2 shows that with high probability no investment is needed the first three years.

The calculated own capital is estimated to be 42 percent the first year of business and the following years with 60% and 56%.
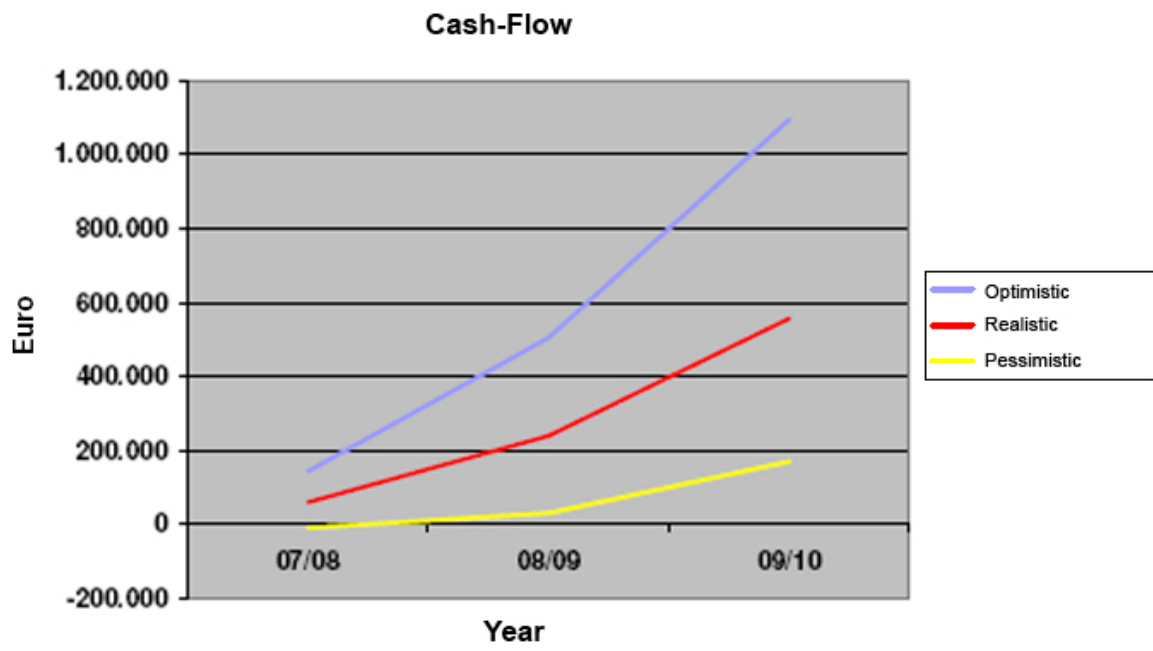
Figure 13.2: Cash Flow

13.2 Business Idea

In Europe and the rest of the world, there exists a variety of web pages and magazines which provide information about all happenings in big cities. They provide information about restaurants, events, cinemas, theater, concerts and other events. German cities, which will be our penetration market, have a lot to offer and the services of these city magazines are popular among Germans in order to get fast and useful information.

CityMob's business idea is to provide quality city information to users fast and easy whenever, wherever and regardless of access to computers or magazines. This is achieved with our mobile application MyCityGuide.

With CityMob's technology, CityMob can target their customers; the city magazine, throughout the world and easily add them to the application. The end-user can choose which city they want to retrieve information from.

CityMob will not only present our customers content through MyCityGuide, but also build our own user base and incorporate additional value adding services. They will be explained in short here.

Community: Users of MyCityGuide are able to create a "buddy-network". Within the network, users can send instant messages, post messages on a "virtual poster" and locate their friends (if approved by the other party).

Map-function: MyCityGuide provides automatic positioning of a user and shows the position on a map. The map can also be used to locate restaurants, clubs, etc.

Public Transportation: MyCityGuide incorporates a service that provides users with information. It answers questions such as "How do I get from A-B?" "When can I travel?" and "How long does it take?"

In the rest of this business plan, city magazines (web pages, printed magazines, e.g. Prinz, Munichx) will be referred to as **customers**, while the people actually using the application on their mobile phone will be referred to as **users**.

13.2.1   Satisfying Users Needs

Major European cities have great deal to offer their residents. A variety of social and cultural activities happen every day and keeping up-to-date in a hectic everyday life is not simple. People need to get a fast overview of those happenings that suit their interests. This situation has produced a myriad of magazines and web-pages which try to fulfil this need. These firms offer users their view about restaurants, happenings, clubs, concerts, theaters, cinemas and similar. The web-pages offers the possibility to search and sort according to own preferences. Many also offer email newsletters if people register with a user profile. Several have also built communities around their users.

MyCityGuide is a complementary product to these established city magazines. It seeks to fulfil the same need, but in different everyday scenarios. Since people carry their mobile phones around all day, 365 days a year, mobile applications are in some situations highly advantageous compared to magazines and web-pages.

CityMob offers users a city guide that is always accessible. When MyCityGuide is installed on users' mobile phones it gives users:

- **The information they need:** A quick and easy guide through the information overflow in the city in question. Every user has the possibility to personalize MyCityGuide according to their interest and needs.
- **Where to go:** A simple way of choosing which restaurant, pub, club to visit.
- **How to get there:** A wayfinder to the location of interest. This wayfinder consist of both interactive maps and public transportation information.
- **Impulsive decisions:** Modern life is full of surprises and it is hard to plan to every detail. MyCityGuide helps users make good and fast decisions whenever and wherever.
- **Community:** MyCityGuide lets users chat with their friends, and plan what to do and where to do it. The build in Friend-Locater function can display the location of the user's friends. Virtual post-it boards provide an easy way of broadcasting suggestions and comments to a group of friends.
- **Ease of Use:** MyCityGuide is designed to be easy to use. Users only have to press a few buttons to get the desired information.
- **Offline Entertainment:** MyCityGuide is a pre-installed application with several of function available offline, like your last search and favourites.

13.2.2   Application and User Scenarios

MyCityGuide can be used for several purposes in many different situations. In order to show its usage diversity, a selection of scenarios are presented:

Usage Scenarios:

- Lisa and her friend are out partying, but now they want to move on to the next club. What places are close by? They start MyCityGuide and search for clubs in their vicinity using the location function.

- Thomas is very interested in theater. He has personalised MyCityGuide so that it automatically receives information about Munich's theaters. While he is waiting for the bus, he checks this week's program.

- Rudolf and his friends are playing football. The guys decide that they want to go to a bar in the evening, but they don't know where. Rudolf picks up his mobile and starts MyCityGuide. The guys discuss a couple of the alternatives they get from a quick search, and make their decision.

- Heidi is bored and is lying on the sofa. She wants to quickly check the program of her favourite concert hall. By launching MyCityGuide she gets the information fast, and does not even have to leave the sofa.

- Friedrich is an active user of MyCityGuide. This weekend he wants to go to Berlin. Luckily, CityMob has a deal with a city magazine there, so Friedrich just switches from Munich to Berlin and checks out the main events.

- After finding a good restaurant using MyCityGuide, Sandra just presses the telephone-link in the information field and reserves a table.

- Karin is very interested in food. After going to a restaurant, she enjoys telling her friends about it. She is, therefore, very fond of the polling option on the MyCityGuide. With it, she can contribute to the ranking of restaurants, and also find out how other restaurants are ranked.

- To find the theatre, Bummi uses the maps offered on MyCityGuide.

- Alma wants to check the status of her friends. She starts MyCityGuide and enters the instant messaging function. In the list of all her friends she sees that Christine wants to go to the cinema later. Alma and Christine chat using the instant messaging feature and thereby plan their evening.

- Thorsten is considering hosting a poker-game with his friends on Friday evening. Before planning the evening, he needs to know if enough of his friends are interested. Thorsten posts a suggestion regarding the poker-game on a virtual-blackboard inside the MyCityGuide - community. All of his friends can see the posting and respond if they are interested. Virtual blackboard functions as a broadcast message, and Thorsten is relieved of sending a SMS message to all of his friends.

- Peter is drinking coffee in the city center. He uses the Friend-Finder function in MyCityGuide to find out if any of his friends are close by. The Friend-Finder

maps the location of Peter's friends, and he then contacts Thomas who happens to be in the same area.

- Anna is at Schwabinger Sieben with a friend and she wants to inform her other friends about where she is. She uses the MyCityGuide mobile application, finds Schwabinger Sieben in her favourites and uses the functionality that informs the MyCityGuide server about where she is. Her friends are then informed via her profile on the MyCityGuide page, SMS, or IM.

- Martha is taking pictures together with her friends, she send the picture via the MyCityGuide application and the picture are posted on the public photo time line/user profile on web.

- Florian is using the *Portable Message* and sends a message to different (groups of) friends in his surroundings. His position is matched with the data of his friends.

13.2.3 Potential Customers

In Table 13.1 it is shown a list over city magazine in the 15 biggest cities in
Germany, all with approximately 500.000 inhabitants or more.

City	Magazines
Berlin	berlinatnight.de, stadtmagazin-berlin, 030 Magazin Berlin, berlinien.de, Frontpage, kulturnews Berlin, Nightlife Berlin, Sergej, Siegessäule, STADTKIND, Tip, zitty, KIEK MAL - die Berliner Kinderzeitung.
Bremen	stadtmagazin-bremen.de,BREMER, Bremborium, Mix, PRINZ Bremen, Stadtus Bremen, port01-CityFlash, Kinderzeitung - das Bremer Familienmagazin, Big, szenenight.de
Dortmund	HEINZ-Magazin, Coolibri
Dresden	PORTPOOL Dresden, DRESDEN NIGHTLIFE, port01-CityFlash, FRIZZ Das Magazin, SAX, Dresdner, PRINZ Dresden, KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt,Blitz!, Stadtus Dresden , DD-INside, eltern, kind and kegel - Familienmagazin für Dresden und Umland
Duisburg	HEINZ-Magazin, der duisburger
Düsseldorf	NRW LIFE, coolibri, Biograph, PRINZ Düsseldorf, Libelle - Stadtmagazin für Leute mit Kindern, Stadtus Düsseldorf, Rhine Magazine, kulturnews Düsseldorf
Essen	HEINZ-Magazin
Frankfurt	Journal Frankfurt, Journal Planer (Beilage der Frankfurter Rundschau), Frankfurt PUR, PRINZ Frankfurt, Strandgut, N!TE, FRIZZ Das Magazin, kulturnews Frankfurt, Kuckuck! - Frankfurter Familienmagazin
Hamburg	Hamburg Aktuell, hamburger-stadtmagazin.de, stadtmagazin-hamburg.de, port01-CityFlash, Hamburg pur, HIER, OXMOX, Piste Hamburg, PRINZ Hamburg, Stadtus Hamburg, Szene Hamburg, kulturnews Hamburg, Bangerang - Stadtmagazin für Familien in Hamburg, UNISCENE - Hamburgs junges Magazin
Hannover	port01-CityFlash, STADTKIND hannovermagazin, Hannover Live, Magascene, Schädelspalter, PRINZ Hannover, Stadtus Hannover, kulturnews Hannover, Hannover Kids - Veranstaltungsmagazin für Kinder und Erwachsene
Köln	StadtRevue (seit 1976), stadtmagazin-koeln, Choices, Einblick, PRINZ Köln (Etablierte Presse), KÄNGURU Stadtmagazin für Familien, Rhine Magazine, Stadtus Köln, kulturnews Köln
Leipzig	SPORTPOOL Leipzig, port01-CityFlash, FRIZZ Das Magazin, KREUZER, Blitz!, PRINZ Leipzig, Stadtus Leipzig, kulturnews Leipzig,KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt
München	stadtmagazin-muenchen.de, munichx.de, munig.com, muenchen24.info, curt Magazin, Applaus, In München, Puccini, GO Stadtmagazin, PRINZ München, FRISCHLUFT, Nachtagenten, kulturnews München, Kitz Familienmagazin, lessordinary.eu, Haus+Hof Baumagazine.
Nürnberg	curt Magazin (Nürnberg), LottaLeben.net, plärrer, MM MonatsMagazin, PRINZ Nürnberg, Doppelpunkt, Stadtus Nürnberg
Stuttgart	port01 City-Flash, lift, Moritz, Freizeitspiegel, kulturnews Stuttgart, Stadtus Stuttgart, Elternzeitung Luftballon, re.flect

Table 13.1: City magazines and potential customers in the 15 biggest cities in Germany

13.3 Company

CityMob is a mobile software developer based in Munich, with roots from the best technical university in Norway, NTNU.

Our motto: **"Go Mobile!"**

The timing is right for this venture, due to higher social acceptance for mobile applications and the right mobile technology to conduct this kind of services; high speed networks and new mobile phones with better screens, processors and storage space. Also the rapidly falling data transfer prices and flat rate introduction are positive drivers.

13.3.1 Company Ownership

CityMob has currently the company form GBR (Gesellschaft Bürgerlichen Rechts), which means that everyone in the company is personal responsible for the company, hence an unincorporated firm. CityMob will in the near future become a limited company, this means a company with limited liability, and there the team members are only responsible for the value of the firm. There are four founders who own the majority of the company.

13.3.2 Management

CityMob's management philosophy is based on responsibility and mutual respect. People who work at CityMob want to work at CityMob because CityMob has an environment that encourages creativity and achievement.

CityMob's management team has built competence with a Master of Science education from Norway's top technical university and have specialization in computer science, telematics and economy. Competence through top class education combined with a dedicated and sincere interest for the provided products makes our customers safe in the belief that they can trust in the results of our cooperation.

The initiator of this project, Petter Johannessen, has worked full time for nearly a year, for one of the most innovative mobile content developers in Germany, Brand New World GmbH. At BNW, he worked close to the management and learned how a mobile content business was run and how they develop. Furthermore, he obtained experience in marketing and product sales.

13.3.3 Partners

The Norwegian University of Sceience and Technology: NTNU provided CityMob with technical knowledge, advisors and entrepreneurial know-how.

UnternehmerTUM: The non-profit company UnternehmerTUM GmbH supports CityMob as an incubator. It is thanks to them that CityMob have office space and the technical support when needed.

SPICE: CityMob is a participant in the European IST-FP6 project SPICE (Service Platform for Innovative Communication Environment). SPICE is addressing the still unsolved problem of designing, developing and putting into operation efficient and innovative mobile service creation/execution platforms for networks beyond 3G.

Innovation Norway: Supports CityMob with juridical and legal advice regarding collaboration with German companies.

Business Intelligence Partner AS: Provides economic and business related advices in regards to the start-up process.

Krüger and Herklotz GmbH: Supports CityMob with knowledge about how to get started as a new company and building the business, by providing contact with different similar companies and potential customers.

Munich Transport and Tariff Association(MVV): The MVV is a transport association that ensures regional public transport. MVV provides CityMob's products with information about the public transport system in Bavaria.

Munichx: Munichx is a city magazine in Munich. Munichx is CityMob's pilot customer and collaboration partner for MyCityGuide in Munich.

13.4 Product and Services

13.4.1 Description of the Product and Service

CityMob's product is a mobile application named MyCityGuide. A mobile application is a small piece of computer software created and designed to run on

mobile phones. After a mobile application is downloaded and installed on a mobile phone, it is always available within a few clicks. Even though there exist many different mobile phones, CityMob's technology enables MyCityGuide to run on a great majority of the mobile phones being used in the mass market today, including PDA's and advanced mobile phones running Windows Mobile or Symbian operating system.

MyCityGuide's main function is to give users city information. In the same way as magazines and web-pages, MyCityGuide offers information regarding:

- Restaurants
- Pubs
- Clubs
- Lounges
- Cinemas
- Theater
- Events (special parties, concerts, operas, festivals, etc.)

13.4.2 Additional Services

In addition to the main functionality, CityMob will integrate several value added services designed for mobile phones:

City Map: Users can use MyCityGuide as a navigation tool in order to find the way to search results (restaurants, clubs, etc), but can also be used as any other map. It shows the area of interest and provides the capability to zoom in/out and navigate to other areas.

Public Transportation: Users are able to enter their current location and their target location as input. MyCityGuide shows then how to get there by using the public transportation system.

Automatic Positioning: By using the possibilities in mobile networks, MyCityGuide is able to automatically locate user. This relieves the users from having to manually enter their position when they, for instance, want to find an Italian restaurant in their vicinity. It is also used in order to locate friends, and to show the user positions on a map.

User Generated Content: MyCityGuide gives users the ability to rank, for instance, a restaurant or a club. Other users can see this ranking and choose

whether to take it into consideration.

13.4.3 Future Enchancements

CityMob has specific plans for enhancements of MyCityGuide. These are functions that are not implemented in the first version, but will most likely be provided in some form in future upgrades.

Community: Users who have registered a user profile are able to take part of the MyCityGuide-community.

This service offers functions such:

- **Groups:** MyCityGuide lets users create groups. A group can be a group of friends from the real world, a group of people with common interests, or any other imaginary constellation.
- **Virtual Post-it:** Users can post suggestions and comments that only other users in their group are allowed to see and comment.
- **Instant Messaging:** A user can send free SMS-like messages from within MyCityGuide to other community users.
- **Friend Locater:** A user is able to locate his/her friends through the friend finder function. It will of course be optional if a user wants to show his/her location.
- **Picture Posting:** Take pictures and send them with the application, and the user profile on web will update itself with the new incoming pictures. E.g. profile picture.

A user community needs a critical mass before it adds value to the users. CityMob, therefore delays the implementation of this service.

Ticket Ordering and E-ticket: After discovering an event (e.g. concert, theater, cinema), users can purchase their ticket directly from MyCityGuide. Their mobile phone can then be used as an electronic ticket (e-ticket) when arriving at the event.

Table Reservation: When a user has found a restaurant, he/she is able to reserve a table for the desired time and date. This service requires collaboration with restaurants and an electronic reservation system at the restaurants. This service will be implemented at a later stage when the requirements are sorted out.

13.4.4 Design

MyCityGuide is designed with these main features in mind:

1. **Easy to use:** This is achieved through intuitive menus and user interface

2. **Fast information:** Desired information is presented to the user after just pressing a few buttons

3. **Minimal data traffic:** MyCityGuide has minimum traffic over the network in order to be a cheap service for the users

4. **Easy scalable:** This is achieved through a modular framework and with use of widgets

13.4.5 Scalability

CityMob is not restricted to only one city magazine. CityMob will have a network of customers which will all use the same version of MyCityGuide. The different customers can, however, customize MyCityGuide to some degree. That is, they can add their personal touch (e.g. logo, background colour, advertisements). The main characteristics of MyCityGuide remain the same for each customer. In this way, MyCityGuide can be thought of as a framework which CityMob can offer to different city magazines. CityMob seeks to get customers whose geographical coverage does not overlap. For example, a city magazine in Berlin is not competing for the same market as a city magazine in Munich, and they can, therefore, both gain advantage using MyCityGuide. It is also imaginable that two city magazines can compete for different markets within the same city. For example, one can be directed toward young people and therefore provide information about clubs and nightlife, while the other is more focused on restaurants and theaters.

This scalability is an essential quality both for CityMob and for the end users. For CityMob, it dramatically increases both the number of reachable users and the number of potential customers. For the end users the result is a product which works in more than one city. MyCityGuide can therefore be used as a source of information in every city where CityMob has a collaborating city magazine. For instance, if one usually uses MyCityGuide in Munich but travels to Berlin for the weekend, one can easily change from Munich to Berlin within MyCityGuide. If this change implies getting information from another city magazine, it will be mostly transparent for the user. Only the city magazine's logo, advertisements and possibly background change.

13.4.6 Custumer Management System (CMS)

To increase the service to the customers, CityMob will make a CMS system on web, where the customer will have their own user profile and administration center, where

they easy can do changes on the application and increase their service with CityMob
with extended functionality. Also technical support and sales will be distributed in
an easy manner in the CMS system, see Figure 13.3.
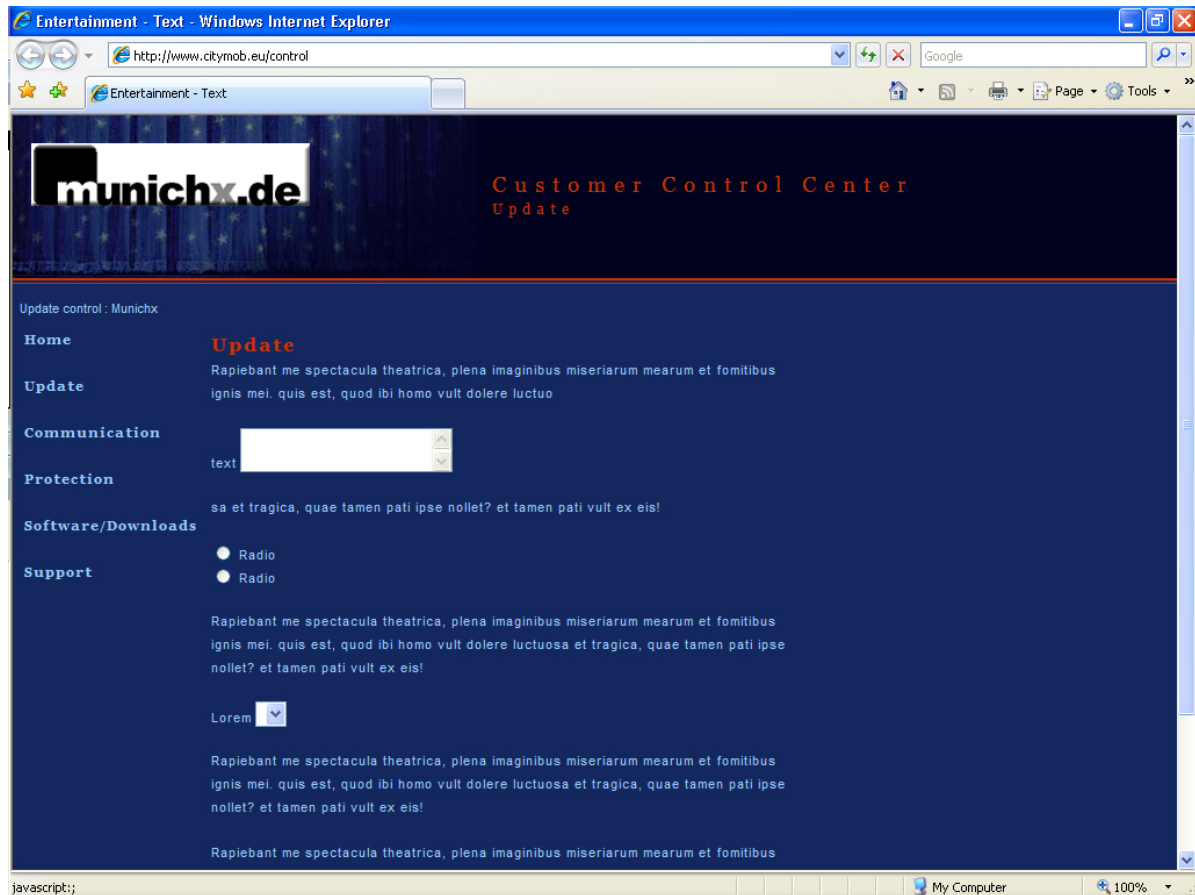
Figure 13.3: CityMob's Customer Management System prototype for Munichx

13.4.7   Development

The CityMob team has adequate resources and programming skills and will
therefore not need additional workpower for the development of MyCityGuide.

13.4.8   Delivery Platform

CityMob strives to make MyCityGuide as easily available as possible. Acquiring and
installing MyCityGuide should not be a hindrance for users. Several ways of
downloading the application are therefore possible. The methods are known to
mobile users, and should not be harder than sending a SMS-message.

Downloading Options:

- Send an SMS with a code word to a special number e.g. MyCityGuide to 1880. The user then gets a return message asking to verify the installation of MyCityGuide. This return message is called a WAP-push message.

- Visitors of our customers' web portals can easily enter their mobile phone number and thereby request a wap push message by SMS to their mobile phones. This method will also be available from MyCityGuide's own web portal.

- MyCityGuide can also be downloaded to the users' computers from the web portals of our customers or from MyCityGuide's own web portal. After MyCityGuide is downloaded to a computer, it needs to be transferred to the mobile phone either through a wire or wireless protocols (Bluetooth, Infrared). This alternative is suitable for people comfortable with using technology. The advantage is that one avoids paying for mobile data-traffic.

13.4.9 External Content Partners

The software MyCityGuide is developed solely by CityMob. However, to add to the value of the application, CityMob need to collaborate with some external firms. These services will be optional but recommended for the customer.

Map: The CityMob's technology supports map solutions from MS MapPoint and ArcView. This means that the client side of the framework is already configured to handle and do requests against these two map software providers' servers. CityMob has an agreement through their collaboration partner UnternehmerTUM, with a free licenses agreement on maps from both MS MapPoint and ArcView for non-commercial use like prototyping, as commercialized use a license agreement between partners have to be made.

Location based Service: CityMob is today in negotiation with Mecomo and ic3s (3rd party deliverance of LBS) to make a reasonable deal for this service.

Transport time table: CityMob has as a goal to get collaboration with the transport information providers in the cities the application will be launched in. In Munich, CityMob has collaboration with the Münchner Verkehrs- und Tarifverbund, which allows CityMob to use their metro/buss/tram table in the application.

13.4.10 Technical Support

CityMob will do all the technical support towards their customer for the product, which includes phone support, online support and e-mail.

13.4.11   Network Externalities

In markets with positive feedback the perceived attractiveness of a product to a customer depend on the number customers that have already purchased the product. The expected number of future customers are also affects the value of the product. When positive feedback is caused by a formal or informal network among the customers/users it is called network externalities or network effects.

The final version of MyCityGuide will contain features that are subject to positive feedback. That is, features which increase the value of the program according to the number of customers.These features are:

- **User Rated Content (USR).** Already in the MyCityGuide-prototype users can rate restaurants, events etc., with a rank from 1-6 stars. The average value of all previous ratings are shown to the users and can be taken into consideration before making a decision. Naturally, the star-values become more valuable according to the number of user ratings.

- **User Generated Content (UGR).** UGC refers to various kinds of media content that are produced or primarily influenced by end-users. CityMob will consider incorporating UGR content after MyCityGuide has a customer base. Users could then add recommendation to future events, post events themselves, add restaurants and similar.

- **Mobile Community.** Mobile Community has been tipped for some years to be a "killer application"'. It has however yet to happen. A community is subject to strong positive feedback. A community with few or zero users has no value. CityMob are considering adding community functions to MyCityGuide.

It is important for CityMob that MyCityGuide avoids the pitfalls of positive feedback. This pitfalls are explained in Section 8.3 and denoted criticalities 1 and 2. An initial customer base is a prerequisite before positive feedback helps a product.

The measures taken by CityMob are:

- **Features without positive feedback.** MyCityGuide's main functionality is presenting city information to the users. By this functionality, MyCityGuide acts as an intermediate between city magazines and users. This functionality is not subject to positive feedback. Thus, the MyCityGuide does not depend on positive feedback and an initial user base to get started.

- **Give it away for free** CityMob will distribute MyCityGuide free of charge (at least in an initial period). This will aid the building of an initial user base.

- **Cooperation.** CityMob will collaborate with established city magazines in

order to get content for MyCityGuide. These providers already have an user base. Some of them also have on-line communities. Through a close collaboration, CityMob that MyCityGuide will act as a attractive complement and therefore gain from these established user bases.

- **Postponing features.** CityMob does not integrate community or UGC (atleast not as a main feature) before MyCityGuide have an established user base. The 3 already mentioned items will build this user base.

CityMob will use the features which do not exhibit network externalities in order to build a user base. First when a user base is obtained, will features are subject to strong network effects (e.g. community) be released. This order of events implies that MyCityGuide avoids the pitfalls of positive feedbacks. Instead, the positive feedbacks will contribute to additional growth.

13.5   External Analysis

13.5.1   Customer Analyse

City Magazine

The city magazines have a urgent need to make their content as easy available as possible. Today their information is easy accesible by distribution on user friendly and good looking web portals and/or by printed magazine. A mobile application will for these companies mean a better distribution channel to the users and give them an advantage compared to competitors.

The city magazine industry has mainly three kinds of players;

- "Global" provider; will cover most of the biggest cities around the world.
- "National" provider; will cover several of cities in one country. e.g. Germany.
- "Local" provider; will cover a city our a part of the country, e.g. Munich or Bayern.

The differences between the providers is normally that the "global players" are more like yellow pages with only static information such as general contact information, adresse and phone number. The "local players" on the other hand, is very good at both dynamic and static information. Dynamic information such as special events and happenings is usual. The "nation players" are existing in both types with static or/and dynamic city information.

The city magazines are having a small core team, which is running the

administrative things and consist of mainly technical staff and editors. Their company has also a wide range of information collectors. The cost of running a city information web portal is minimized and is nearly limited to the cost of the employees. If the city magazine is also in printed form, they additionaly have the printing and distribution cost. If they are operating in magazine form, the magazine is normally distributed once or twice a month.

On their web page all information is free of charge, and some of them like the nationwide provider Prinz, is also connecting a community to their web page.

The city magazine's income is mainly from commercial.

The local city magazine Munichx.de, who operates only in Munich and only as a web portal, had in October 2006, 456.822 unique visitors and 1.647.345 page impressions on their web page.

A local city magazine like in-munchen which is distributed free of charge 2 times a month, and which is a complement to their web page, has around 200 000 readers on their magazine version. You can find the magazine in many kiosk, restaurants, cafees, bars, schools or you can get it by subscription to 30Euro for 25 exemplare.

End user

The typical user of city web portals and magazines, is people in bigger cities, living the urban life, who like to be up to date with happenings and events, like new impulses and being out with friends. The information is also useful for turist, travlers, business people, students and people temporary living in the cities.

Through CityMob's market surveys, it was a clear pattern that today people have to check for e.g. restaurants and clubs before they go out. Many people also had city magazines at home, but most people who read this kind of magazine read them at a cafe or public place surch as school. CityMob marketing research showed also that many people went out to places recommended by friends or to their usual place to go out.

The end user solves their need for city information by:

- Reading newspapers,
- Commercial, e.g. flyers and posters

- Read free city magazines or buy city magazines
- Access the different city content web pages
- Tip from friends and colleagues.

The city information is mainly free of charge for end-users, however, some of the magazines will cost the user around 1-5 Euro.

13.5.2 Competitors

CityMob has competitors making city guides for mobile phones. However, no mobile city guide is based on collaboration with city magazines. The exsisting mobile city guides are also very new on the market and has not established any appeal to the mass market yet. These guides can be seen as indirect competitors and will be explained in short.

Google Maps Mobile, is a world wide application on mobile phones and provides maps and possibilities to search for e.g. restaurants, hotels, pizza etc. After a successful search, a short information window can be shown together with the location of the search result. However, not all establishments are included. Google has an interface on web where business owners can add themselves to the database.

Disadvantages:

- Does not have automatic positioning on their maps like GPS or network location based service
- Does not have sufficient search possibilities and route planning
- Static information, no dynamic information is provided. (like e.g. events, today's happenings)
- No, agressive marketing
- No, automatic dowload by wap push message

Advantages:

- Big company
- An interface which is easy to use
- Recognition from their similar web tool
- Their partners

MyCityMate is an application for many cities in Europe and some in the rest of the world. MyCityMate is based solely on user generated content (UGC), no cooperation with content providers or promoters exists. An important part of MyCityMate is community. Users share reviews, favorite places, events and thoughts with each other. MyCityMate does not provide users with city maps, route planning is only provided through a static metro-map. The fact that the content is user

generated means that in many cities available information is limited and the quality of what is available can also be questioned.

Disadvantages:

- Does not have any maps
- Does not have any automatic "point of interest" information like GPS or network location based service
- Does not have sufficient search possibilities and route planning
- Does not have sufficient content
- Lack of trust of information, since the content is user generated
- Static information, no dynamic information is provided (like e.g. events, today's happenings)
- No, marketing, beside their web portal
- Can not be downloaded by wap push message

Advantages:

- Been on the market since 2003
- An interface which is easy to use
- Not depended on content providers, but relying on user generated content

Microbrowsers are a way of accessing the content already available on the internet using mobile phones. When using microbrowsers, WAP page creation is unnecessary. An example of a microbrowser is Opera Mini. Microbrowsers adapts (to a small degree) internet for small screens. This can hardly be said to be successful for most pages. A lot of traffic is to be transferred over limited bandwidth and big pages on small screens imply a lot of scrolling.

Disadvantages

- Continuesly online, with a significant data traffic, which make it slow and expensive in use
- A "best effort" screen design
- Difficult to find good information fast, due to the amount of accesable data

Advantages:

- Access any city information and more
- Not depended on content providers

Qiro is an application for Germany. Map and automatic positioning are its main features. Qiro provides the users the possibility to find points of interest (POIs) nearby. POIs could be restaurants, park places, hotels, cash machines, cinema, bikes, doctors and similar. After specifying which POIs you want to locate in your proximity Qiro automatically positions you and shows a map where the POIs are marked. Qiro does not provide any other information in regards to POIs than location on a map. Type of restaurant, phone number etc. is not available. This

makes Qiro not a current direct competitor to our product. Qiro is in addition slow and not very well designed.

Disadvantages:

- Does not have GPS location based service
- Does not have sufficient search possibilities and route planning
- Static information, no dynamic information is provided (like e.g. events, today's happenings)
- No, marketing
- Difficult in use

Advantages:

- Early on the market with automatic postioning service
- Their wide range of functionality

13.5.3 Supplier

Mobile Operator (T-Mobile, O2, Vodafone, E+)

The mobile operators play an important role in the delivering platform and for the users use of the application. Since the operator has a lot of free capacity in the network, they are welcoming content providers as collaborational partners to use this free space.

Mobile applications will normally be distributed through a SMS wap push message. This service is provided by the mobile operators or a 3rd party provider. Small market players are normally refered to 3rd party provider like ic3s and Whatever Mobile, by the operators.

The users have to pay some data transfer cost each time they do a request in the application, e.g., search for today's events. The cost of the data transfer defers from which kind of mobile subscription contract the users have, see Figure 13.4.

Update the application with:

- 15 words, takes approximately 4 KB
- 250 words, takes approximately 8 KB

Location based Service

To make a request in respect to point of interest without GPS, some additional costs appear. Location based information in Germany is only available through network

Contract	Cost per month	Data transfer incl. (in MB)	Cost pro 1 MB
o2 Internet Pack S	- €	0	0,09 €/min bzw. 9,27€/MB
o2 Internet Pack M	10,00 €	200	0,0500
o2 Internet Pack L	25,00 €	5000	0,0050
T-Mobile Web'n'Walk Basic	20,00 €	200	0,1000
T-Mobile Web'n'Walk Medium	35,00 €	400	0,0875
T-Mobile Web'n'Walk Plus	50,00 €	5000	0,0100
E-Plus Online Flat 150	20,00 €	150	0,1333
E-Plus Online Flat 5000	30,00 €	5000	0,0060
Vodafone Life	- €	0	1,95 € / 5 Min
Vodafone Web Connect vol. PDA	9,95 €	30	0,3317
Vodafone Web Connect vol. I	19,95 €	200	0,0998
Vodafone Web Connect vol. XI	34,95 €	400	0,0874
Vodafone Web Connect vol. Fair Flat	59,90 €	5000	0,0120

Figure 13.4: Price example for mobile internet cost in Germany

based requests and it's provided by 3rd party provider who has agreement with all of the 4 network operators. For each request a cost of approximately 0,09 - 0,15 Euro is debited.

Map

To increase the value of the city application, map was considered as an important feature. The map industry is distinguished in three main parts.

- Map suppliers: This is companies which are making maps. They physically drive around taking pictures and writing down what they see and then create maps. E.g. TeleAtlas, NAVTEQ and AND.
- Map software suppliers B2B: The one who has license agreement with the map suppliers, and make a map software by adding functionality and additional features e.g. zoom function, way finder, find restaurants and so on. Example on 3rd party mapsuite, ArcView and MS MapPoint
- Map software suppliers B2C: The one who has license agreement with the map suppliers, and make commercial software out of it. E.g. Map 24, google maps and yahoo map.

In general it won't be possible to get maps for free, especially not for a commercialized application. Both Google and Microsoft are customer of TeleAtalas and NAVTEQ and have to pay per request between 0,0x- 0,04 Euro.

The cost from map is estimated to be around 0,02 Euro per request.

13.5.4 Treath of Entry

The city information market is a stable market dominated by the web portals and magazines. The conversion of city information into mobile, will probably take a while, since the city information companies are not the most highteck companies. However, with the success of the mobile city application, other companies will see the need for go mobile as well.

Retaliation against new entrant may take place, in form of increased adverising and sales promotion.

CityMob belives that it will be room to breath for the exsisting market players and a mobile solution, since the mobile application is filling a different need then the exsisting solution, the mobile application is not for reading long articles with a cop of coffe, but more when you need fast and concret information on the run.

Established programming companies and small consulting companies will probably become a treat, if city information on mobile sees success.

13.5.5 Social Aspect

City magazines
CityMob's challenges is to convince the different companies that the mobile phone is a valuable communication channel for their content. Normally, it will be a older group of people making the decisions in these firms, with an high sceptic to the mobile platform, since most likely they don't have an own need of using a city mobile application. This task is getting easier as threatening city content providers on mobile pops up, and because of the emerging trend of different media who goes mobile like CNN, Gmail, Flickr, Fotball365 and Maxim.

The main added-value for customer

- Get access to the mobile marked together with optional value-added services
- Offer to join a world covering network of city information
- Take advantage of user generated content
- Outsource of all tasks related to the mobile application like, development, delivering, billing and technical support.
- New way of communicate with the users
- Revenue share model from premium users and commercial
- Tailored information distribution possible for customer, based on user profiles

- Get more independent from current information channels

Users

Since nearly every youth and adult has a mobile phone, it is a huge market for mobile applications, the challenge is to change their usage pattern, and bring the mobile city guide into the users' everyday habits.

Living the urban life, time is precious. Whether you are lost somewhere, need some city information on the run, or have some spare time, it is easy to open up a mobile application and find the needed information or entertain themself. This can be done whenever and wherever.

If you get lost on the way to a meeting point, or you want to move from one disco to another. You have today two normal approach. You can ask people about advice or you can do the time consuming "trial and error" method.

Most mobile users have played a game on their mobile like "snake" or more advanced games. The city mobile application will be opened in the same procedure as a game and the design will be as easy in use as the rest of the mobile phone software.

Today, the younger generation is using their mobile as an entertainment platform. The mobile entertainment market is currently still dominated by ringtones, wallpapers, chatting and information services. This generation will have no problem downloading our product from a web portal or by ordering it by SMS after seeing a commercial. Also, the willingness to pay for mobile services is accepted among people, especially in compare to the Internet where most services is for free.

The Asian mobile market, with Japan, Taiwan and South- Korea as leaders, had a huge success by launching city information on mobile phones. This is an ideal market for CityMob to learn from.

CityMob hope to convert users' habits in search for city information. The main value provided by MyCityGuide for the end user:

- Access city information from all the biggest cities in the world
- An easy to use, high quality and specially made design for mobile phones
- Offer the user location based information from "point of interest" (e.g. restaurant close to current position)
- Give the opportunity to access instant location based information whenever and wherever

- Community functions in order to keep in touch with friends
- A mobile application with minimum data transfer for users, hence low costs
- Offer the users a network of city information on a mobile phone application, based on trustful city information providers

13.5.6   Future Technology

Drivers

W-LAN and W-MAN:
The future is wireless, this means that all cities will be covered with wireless technology like WiMAX. Already it exsist, cities that has become wireless in several of countries like USA, Canada, New Zealand, Italy, UK, Norway and Taiwan. It also exist free "hot spots" around in the bigger cities, where user can use wireless connection like T-mobile hot spots, places like Starbucks, airports and other cafe and restaurants. The wireless technology will make our applications free of charge when used. Today only the more advanced mobile phones are delivered with wireless connection. However it's a clear trend that also cheaper mobile phones get W-LAN, e.g. Nokia E61 has W-LAN and costs around 300 Euro.

GPS functionality on mobile:
In Japan all new mobile phones have already implemented GPS, this trend is forecasted will be followed by the rest of the world. Mobile phone manufacturer like Nokia is delivering GPS on many of their new devices. However, to deliver our product to GPS end-devices, will remove our network location based costs and make us less depended of the mobile operators.

Better mobile phone technology:
The technology trend on mobile devices is increased processor speed, better storage place (due to high quality camera and music storage) and better colour screens. The evolution of mobile phones makes it easier to make good user appealing applications.

Increasing 3G Penetration:
The introduction of 2.5G and 3G networks and handsets has provided a mobile gateway to the Internet and access to an ever widening range of mobile entertainment products and services for a growing number of mobile telephony customers.

Threat

iPhone:

If iPhone becomes a success it will limiting our target market, since iPhone don't support J2ME and Apple don't permit 3rd part content delivering.

GPS companies go mobile:
The increased number of big companies delivering GPS maps and services will have short way to approach the mobile market. These providers will be able to compete with CityMob on a global scale and with equal positioning and map software. Our strength will be our content, since most of these providers only deliver basic static information like "yellow pages".

Convergence between mobile and computers:
The mobile phone development goes in two directions

- Simple mobile phones should be as slim as possible and with minimum functionality.
- Advanced mobile, should have as much functionality as possible.

A part of the mobile market will aim for the convergence of mobile phones and computers. New mobiles with operating systems close to computers will emerge. However, this means increased competition since the entering barrier for developing product on this market is lower then for normal mobile platforms.

13.5.7   Mobile Entertainment Revenue Opportunities

Global Market Product Breakdown
The total global market for mobile entertainment products and services is estimated to be 17.3 billion dollar in 2006, growing to 76.9 billion dollar in 2011. This is a cumulative average annual growth rate of 35

Global Market Regional Breakdown
The mobile entertainment market is dominated by the Asia Pacific and European markets. At the start of the period Europe and Asia Pacific constitute 80% of the market. By the end of the period, rapid growth in developing markets and in North America, will have reduced the domination of the two largest regions to a 69% share of the market. Strong revenue growth is forecasted in the North American market, despite a considerably smaller subscriber base than Asia Pacific and Europe and despite the restricted market for adult and gambling services.

CityMob's market - leisure information data service
The total global market for all forms of mobile leisure and information data services (content and messaging), including alerts, SMS and MMS messaging/information

services, chatting, wallpapers and images, video clips, streamed video, is estimated to be 4.17 billion dollar. This is forecasted to grow to just under 9.5 billion dollar by 2011. This is a cumulative average annual growth rate of 18%, despite significant price erosion towards the end of the period.

Drivers	Constraints
• Anywhere, anytime accessibility	• User experience and confidence
• Fun and relaxation	• Network and handset limitations
• Target market match	• Pricing
• Increasing mobile penetration	• Digital rights
• Increasing 3G penetration	• Localisation and optimisation
• Product innovation	• Complex delivery chain
• Supply side competition	

Source: Juniper Research

13.6   Value Configuration Analysis of CityMob

CityMob's business exhibits the characteristics of two different value configurations models. The overarching model is a a value network, but the value shop model is also present. Both models are elaborated upon here, with emphasises on the value network as the primary value configuration.

13.6.1   City as a Value Shop

CityMob uses of a new medium in order to solve peoples need for city information. In addition, CityMob should solve city magazines need to expose themselves on the mobile phone medium. One part of CityMob's business is therefore to figure as a problem solver. This requires thorough insight in user and customer processes, and an in-dept knowledge of available technology.

Technological changes can force/enable CityMob to provide new ways of solving customers and users needs. Changes in customers and/or users needs can force/enable CityMob to find new ways of using the technology. Changes in users' needs could also reflect a new target group or new market segment. Such a change could be driven by new market opportunities or threats. All these factors implies that CityMob must constanly be open for revision of MyCityGuide. CityMob will have to build a strong "toolbox" from which better and more adapted solutions can be built.

13.6.2   CityMob as a Value Network

CityMob relies on mediating technology and creates value by facilitating exchanges between customers. The value of the portal depends on the number of exchanges which are possible. Based on this, it is clear that CityMob's overarching value configuration is a value network.

After MyCityGuide has become a successful product with a solid user base, value network characteristics are most dominant. Especially the MyCityGuide-community solution needs a user base in order to add real value to our application. The perceived user value of a community increases with the number of reachable users through that community. When another user joins the community, the value increases for those already using the community. A substantial part of our revenue model also depends on the number of users. Advertisement incomes are directly linked to the number of people who can see the advertisements, that means, the number of users. In the same way, revenues from promotion of certain clubs, restaurants etc., depend on the number of users. The value for users of CityMob's,

MyCityGuide, depends on the number of city magazines CityMob collaborates with. The more collaboration agreements CityMob establishes, the more cities are covered by MyCityGuide. In the users' perspective, this increases the value of the service.

MyCityGuide provides links between:

- Advertisers and end-users. Advertisements on MyCityGuide can be seen by the users, and the value of the advertisements depend on the number of people who sees them.

- End-user and end-users. The community functions are exchanges between users. The value of ranking, User Generated Content, and blackboard/forum (or similar solutions) depend on the number of contributors.

- City magazine and end-users. MyCityGuide gives city magazines a new communication channel to those already using their service, but also enables them to reach new user groups. Through company branding and a revenue sharing model with CityMob, city magazines will get increased revenues with increased number of users. The number of city magazines collaborating with CityMob affects the service value for the users. A greater number of city magazines implies that more information is available through MyCityGuide. Typically this would mean more cities, but different types of content within one city could also be a possibility.

As a mediating company, primary and supporting activities can be identified. These activities are shown in Figure 13.5. The three primary activity categories overlap in order to underline the concurrent interactivity relationship between them. Since value is created by mediating between city magazines, end-users and advertisers, the figure does not contain an arrow which underlines the final "customer".

As a value network, CityMob's primary activities are:

Network promotion and contract management

CityMob must promote its network towards end-users, content providers and advertisers. Furthermore, CityMob must select which city magazines they have to invite to its network in order to increase network value. Marketing of MyCityGuide is necessary towards end-users. Companies interested in buying advertisements space on MyCityGuide need to be found and negotiated with. As the network value increases related to the number of end user, this will be an interactive process. A set of contracts which commit both CityMob and the collaborating parties to a mutual set of obligations, is needed. These contracts must be initiated, managed and terminated. They should govern service provisioning and charging.

Service provisioning

Service provisioning consists of activities associated with establishing, maintaining and terminating links between the actors connected to the mediating service and billing them. Billing schemes are agreed on in contracts. CityMob must measure the usage of MyCityGuide in order to correctly charge advertisers (directly or indirectly) and possibly city magazines. Charging users for "premium-services" is also a possibility.

Infrastructure operations

These are activities related to assuring that MyCityGuide is running properly. Database maintenance (upgrading), application patching, and content provider interface important operations. In order to adapting MyCityGuide to work on newly released mobile phones can also be considered to be an infrastructure operation since it is necessary in order to make the service run.
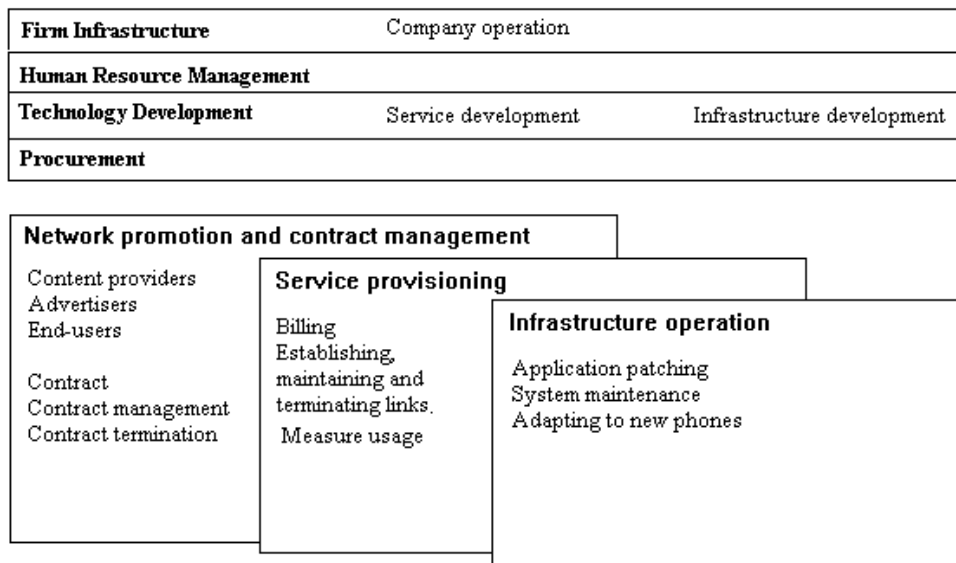
Figure 13.5: Value network diagram for CityMob. Both primary and support activities are shown.

CityMob's four support activities as a value network are:

- Company Infrastructure.
- Human Resource Management.
- Technology Development.

- Procurement.

Company infrastructure is concerned with operating the company, i.e. general management financing and management information systems. Technology development can be divided into service development and infrastructure development. Modification and development of MyCityGuide belong to this area. Infrastructure development could be new database technology, modification of customer interfaces, communication protocols and similar. Procurement is linked to network infrastructure and service development. Examples are the purchase of more servers, test devices, a new internet domain or increasing bandwidth.

13.6.3 Company Strengths

- **Small size:** The small size of CityMob and thereby its fast decision-making, enables the company to quickly adapt to changes and redirect the focus according to the market's needs and opportunities. No path-dependence: It can create business from scratch, and is therefore more willing to pursue completely new approaches.

- **Experts:** CityMob has a network of experts which aid in both business as well as technological issues. The German incubator UnternehmerTUM, provides CityMob with all their expertise and knowledge. CityMob has an invaluable connection to the Norwegian University of Science and Technology.

- **Market knowledge:** CityMob's team are themselves a part of for MyCityGuide's target group. This implies direct knowledge of user needs through both own experiences and a contact network in the target user group.

- **Development framework** play.Tools is a development framework provided by CityMob's incubator UnternehmerTUM. play.Tools reduces development time and thereby enables faster adaptation to the market.

- **Highly Educated team:** CityMob's team consists of graduates from the best technical university in Norway (NTNU).

13.6.4 Company Weaknesses

Liabilities of newness:

- CityMob has a low company capital and no customer base.

- CityMob has yet to produce its first product and is not a known player in the mobile application market. Neither is the company known from other businesses.

- CityMob's full-time employees have limited experience in bringing a business idea to the market.

Liabilities of smallness:

- CityMob has limited negotiation power towards city magazines, map providers and premium-SMS providers.

- CityMob can neither have its own marketing department and need external help to e.g. accounting and legal issues.

13.7 Market Analysis- Summary

Strength

- Flexible and highly motivated team
- Early on the market with mobile city guides
- Collaboration with the best technical universities in Norway and Germany
- CityMob's technology and development framwork, play.Tools

Weaknesses

- Low company capital
- No brand name
- No successful product series
- No customer base
- A small group of business partners
- Low experience level

Oppurtunities

- Collaboration with well known brand names e.g. MVV, Tele-Atlas, O2, T-Mobile
- Collaboration with well known city magazines e.g. Munichx, Nachtagenten, Stadtus
- Do marketing through our partner web portals
- Enter the nice market of offering technical mobile solutions for city guides
- Use our partner well-known brand name to promote our products
- New technology which make our service better and cheaper for customer

Treath

- Bigger players who enter the market with better products
- The social aceptance among users for such service
- The decision board among city magazines
- New technology which will decrease the market size and/or increse the competition

13.8 Goal/Vision

Product

- **First mover advantage:** CityMob hope to be one of the first to offer city content om mobile in collaboration with city magazines.

- **Network of city content:** CityMob idea is to connect the different city magazines to the application with smart technology solutions, and then give user the opportunity to choose city of interest.

- **High appeal to user target group:** CityMob hope to have a high penetration rate with city mobile applications in our main target group; The mass market of people in the age 16-33 years old.

General

- **Internationalization:** CityMob is aiming at being an international publisher, developer and distributor of mobile content.

- **Technology advantage:** CityMob will do they best to be ahead of new technology and have a strong collaboration with the technical network at NTNU and TUM.

- **Collaboration:** The international player, CityMob, seeks a international network of clients and partners from well-known brand names.

- **Innovative and flexible:** CityMob hope that in the future they will be able to develop their own products and CityMob will always look for new markets and ideas.

13.9 Strategy

CityMob has defined the target market of city magazines, their needs and their customers, and have differentiated itself by offering a unique solution which will improve the city magazines through a new distribution channel and give them an advantage compared to their competitors. Our sales and marketing strategy will be a combination of targeted mass marketing techniques as well as a focused, direct sales team approach. Reasonable sales targets have been established with an implementation plan designed to ensure that the goals set forth above are achieved.

13.9.1 Collaboration with City Magazines

CityMob's strategy will be to seek collaborations with established city magazines in Germany in order to get quality and up-to-date city information. MyCityGuide can be thought of as a framework for presenting city information. This scalable ability gives CityMob the possibility to initiate cooperation with several city magazines in order to reach as many customers as possible. This means the cities/areas covered by MyCityGuide are equal to the sum of the cities/areas covered by CityMob's collaborating city magazines. These different city magazines can to some degree

customize the application according to their firm (e.g. banners, colours) but the main design will remain unchanged.

CityMob's benefit from this cooperation is that MyCityGuide presents high quality content to our users. The content presented is always up-to-date and represents a wide range of what the city in question has to offer.

Cooperation with CityMob adds value for potential customers:

- **Advertisement:** Our customers already have significant income from advertisements on their web-page and in magazines. Cooperation with CityMob will give them the possibility to get another revenue source through advertisements in MyCityGuide. Users of MyCityGuide will register and create a user-profile containing personal information. Advertisements can therefore be targeted toward specific users and thereby increase the value of the advertisements.

- **Revenue from Premium-Users:** MyCityGuide can be used completely free of charge. However, in order to access extra functions a premium-user subscription is needed. Premium users will get MyCityGuide without advertisements. CityMob will share this income with our customers.

- **Special Promotion:** Another source of revenue is the promoting of special pubs, restaurant, events, etc. inside MyCityGuide. These special promoters will be prioritized over others.

- **Differentiating:** There are many established city magazines in Germany. In several cities, several are competing for the same users. CityMob's market research shows that none of the city magazines have a mobile solution. Cooperation with CityMob's mobile solution will give them a complementary product that differentiates them from their competitors through a better service portfolio. Further will they also response to new threats on the market such as Google Maps and MyCityMate Mobile.

- **Complementary Service:** MyCityGuide is a complementary product to magazines and web-sites. In many situations people need quick, fast and reliable information. MyCityGuide improves the service CityMob's customers provide to their current user, and can thereby increase average revenue per user (ARPU).

- **New Market:** CityMob's customers will be able to reach a new market of users. A combination of better terminals, faster and cheaper services have recently made mobile services more valuable to users. In western countries there exist more mobile phones than people. The mobile market is said by many to have a huge potential. MyCityGuide gives city magazines an opportunity to get their share of this expanding market.

- **Cooperation:** CityMob is specializing in mobile applications and will develop and provide support for MyCityGuide. Customers can therefore continue to concentrate on their core capabilities.

13.9.2   Pilot Customer in Munich

CityMob has allocated Munich as the best starting point for the business idea. The city has a population of about 1.3 million (as of 2006) and the Munich metropolitan area is home to around 2.7 million people. A collaboration partner in Munich will give CityMob "proof of concept" and a good start to convince other city magazines about the idea. First, CityMob is aiming for other cities in Germany, and then it will be looked further into the opportunity to scale on an international level.

During CityMob's market research six city magazines was recognised as a potential partner in Munich;

- 3 city magazines covering the whole of Germany; Prinz, Nachtagenten and Stadtus.
- 2 popular local players covering Munich; "In-München" and "Munichx".
- 1 government controlled city web portal called "muenchen.de".

The local player Munichx was preferred as pilot partner for the penetration approach in Munich, due to their quality content, they own and collect their content themselves and their wide popularity in Munich.

13.9.3   Collaboration with NTNU

CityMob has today a close relationship with the technical network at the Norwegian University of Science and Technology in order to optimize the products. This collaboration is valuable for CityMob to be up to date with the latest technology. CityMob is today exchanging information and knowledge with big projects at NTNU, such as Wireless Trondheim, represented by their project leader John Krogstie and the Service Platform for Innovative Communication Environment (SPICE) project, represented by Mazen Malek Shiaa, who is a researcher of telematics at NTNU. A close relationship with NTNU will give CityMob's products a better chance for improvement and innovation.

13.9.4   Marketing and Sales Strategy

Marketing and sales strategy towards city magazine

CityMob's customer and collaboration targets will come from lists of firms fitting the criteria to the city information network and application which management and

sales has generated through market research efforts. During CityMob's B2B research, several of the city magazines in Germany and England were approached and many companies said they would be interested in collaboration. Tactics for approaching these prospects will be indirect, i.e., CityMob will contact sales managers and/or franchisees to establish whether the firm fits our profile and then probe for upper- or middle-level management contact information. CityMob will attempt to establish face-to-face meetings with decision makers (CFO, CIO, and COO) where CityMob will present our city mobile idea and a proposal tailored to their needs, with our value-added content. If possible, CityMob will also have this proposal reside on an extranet so that the client can modify the proposal and see first-hand how the product and service work.

Marketing and sales strategy towards users

The mobile city application is aiming for the mass market, but the main target group is people between 16- 33 years old and is an active user of city information portals and/or magazines. This group, according to CityMob's marked research, is a part of the generation which is well adapted to the digital society and living the metro life, with an instant need of knowing what is happening in the city, what their friends are up to and how to get to the events, whenever and wherever.

Marketing of our content will go mainly through our partner's web portals, which are popularly visited pages, but also flyers, cinema and TV- commercial will be considered. However, as our application grows, CityMob want to focus our marketing on TV commercials.

The Viral Effect - "Tell-A-Friend" function
CityMob believes also that the viral effect will be an important feature, where the logic is that the application is spreading itself. This enables new and large user potentials to be generated, which could not be displayed in the target group analysis. Hence, the spread of the product depends on word of mouth publicity, i.e. the communication between the consumers. This reduces the amount of cost spent on marketing communication.

- The user can use the "Tell-A-Friend" function to send an SMS message to friends and acquaintances, and tip them about the mobile application.
- If you send the application to 5 friends who register you will become a premium user for free in 3. months.
- Each mobile phone number can only be registered once.

13.9.5 Business Model

The business model has a fixed service cost income from city magazines, and also fixed prices for the users. But the revenue sharing model between CityMob and city

magazines will be adapted to the different city magazines' size and their current prices on commercial and promotion.

Our income will come from mainly

- Fix monthly price from city magazine
- Income from premium users
- Commercial within the application
- Promoted and pre- installed businesses in the application.

Price model for customer

CityMob's first customer will get our service for a minimum price and risk. The fix cost will increase for the next customer. The reason for this is to fast build up a customer portfolio and show "proof of concept" to new customers. The prices in 13.9.5 are based on how many users have downloaded the application all together. The price list will only be valid to the first customer and will increase and be adapted to different cases.

Users	Price
0 − 500	500
500 - 1.000	1000
1.000 - 5.000	2000
5.000 − 10.000	3000
10.000 − 50.000	Re- negotiations

Price model for user

Free Download:
The user can download the application free of charge and pay only for data transfer.

Free use:
The user can use a partial working version of the product free of charge. The free version will include information about restaurants, clubs, cinemas and events.

Premium user:

For an extra 4,99 a year, the user would be able to access extra functions such as: transport information, maps, and a commercial free application.

Commercial:
Special places will be reserved for commercials in the application e.g. when loading (getting information from server) and banners. These advertisements will either be entertaining or informative. Revenues from advertisement increases with the numbers of users.

Promotion:
Pre-installed businesses on favorites, search results and special event promotion.

13.9.6 Other Ways to Earn Money on MyCityGuide

There are many ways of making money on the city application. Since the final revenue model has to be negotiated with each customer, here are some additional ways to earn money on the application:

- **User Pays:**
  - When downloading the application
  - A monthly fee
  - When using special functions
- **Special promotion:** Restaurants, clubs, etc, can pay for extra promotion. That is, some places are prioritized over other:
  - They appear more often / more visible in search results
  - They get a positive review
  - They are integrated in the application and are therefor available in offline searches
  - They appear on the maps
  - Big chains, for example McDonald can have an own search function which only find McDonald branch offices
- **Customer Fee:** Our customers (the city magazines) will pay:
  - A development fee
  - Fee per download
  - Service support fee

13.9.7 Operation/Platform/CRM

Monitoring Usage and Users: Revenues from advertisements and special promotion will typically depend on the number of users and how often and in which way they use the city application. CityMob's technology enables us to

register and store information regarding user behaviour and then be able to improve our product and ARPU, see Figure 13.6.

In short:

- Aggregation and profiling of interaction data through different channels (SMS, IVR, Web) in a central data warehouse
- Development of long-term customer relationships with recurring revenues through up- and cross-selling
- Marketing of (permission-based) viewer and customer data for mobile marketing campaigns

13.9.8   Web Plan

Company Web Portal
The CityMob website will be a pure business- to-business (B2B) web page, and act as a virtual business card and reference portfolio for the company. The CityMob website will be designed by CityMob's own professional web designers, and will be made simple, yet elegant and well designed, will stay current with the latest trends and provide information to the customers as well as a portal to our service and products. CityMob has both the domain (www.citymob.de) and (www.citymob.eu). The temporary design of the web page is also attached to the external appendix.

Product Web Portal

- Our city guide product will have its own Business-to-Customer (B2C) web portal, which will have its own theme and web domain. This page will be developed by us in collaboration with our customers.
- Our product will also be marked through partner homepages, since this will be the best way to reach out to the users.

CityMob will maintain a two-way link between our website and our product suppliers. In addition to using the page as a sales tool, CityMob will develop a monthly newsletter and a "tell- a- friend" function.

13.9.9   Market Strategy

The introduction on the market of MyCityGuide will take place - as far possible - at big events in Germany. As first approach for the marketing of the application in Munich, CityMob will launch the MyCityGuide on the Oktoberfest, as well as to North Rhine-Westphalia in the centers of Cologne, and Düsseldorf for the event and highlight; carnival "zu Weiberfastnacht und Rosenmontag".

Customer Relationship Management
Implementation Strategy – Long-Term
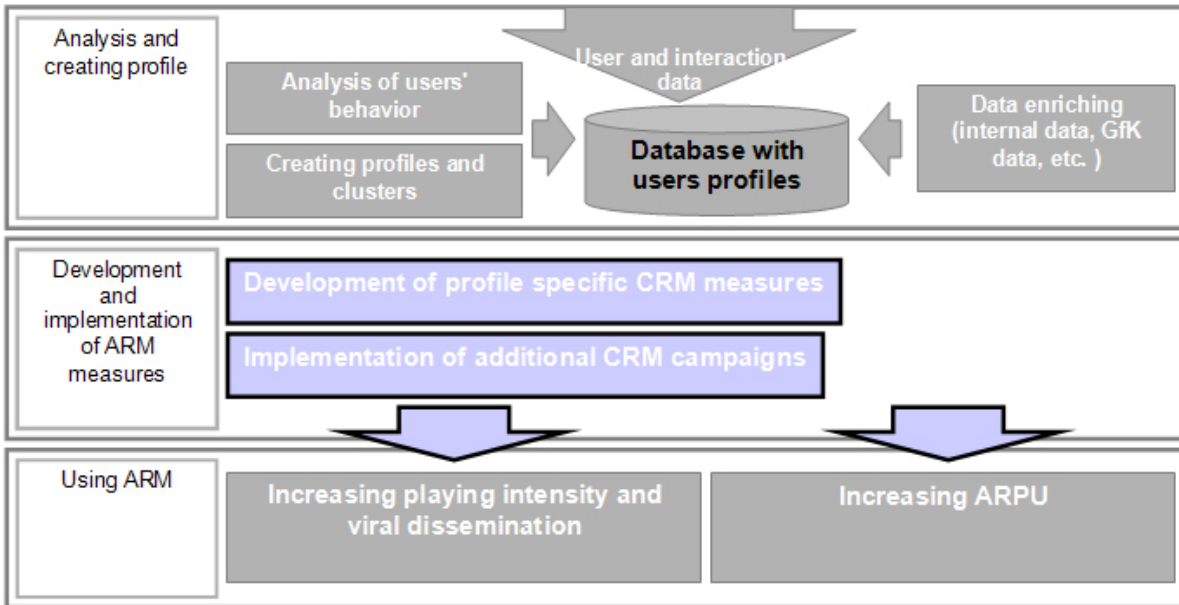
Figure 13.6: Customer Relationship Management System

These events have the advantage, that they are optimal for marketing stunts and activities. An increased need for the MyCityGuide is also present, especially for people who is only on visit, and new in the city.

In this context viral marketing will be important, such as mouth-to mouth propaganda and recommendations of friends. This will reduce the marketing costs, further it will probably lead to a higher acceptance by the customer. The events is a perfect place for use of the community functions on MyCityGuide, e.g. notify your friend about a common place to meet and the "tell-a-friend" function, where you can free of costs send a SMS with a wap downloading of the MyCityGuide to your friends.

Scenario in this context in Köln;
A group of friends wants to go to the carnival in Köln, in an area of thousand of other carnival party people, through the friend locator function is it easy to know where your friends are. Later that evening the friends want to go to a party. They have all heard about different parties, and decide to find a party close by. With the MyCityGuide application they locate the parties close to their position with a ranking of the places for this evening. They decide to go to Mood, and are also posting this on the virtual blackboard in the MyCityGuide application so all their friends in their friend list can see where

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they are, and can then meet up.

13.10 Financial Plan and Requirements

The financial plan and the financial requirements will cover the next three years and is based on the business model in Section 13.9.5 and the market estimation in Section 13.5.

With background in the realization plan in Section 13.9.9, it is calculated a forecast for user growth for the MyCityGuide application. It have been calculated with a slow growing number of city magazines on 1% pro year and a growing number of user on the mobile service of 10% pro year. From these assumptions it is forecasted that by December 2010, MyCityGuide has 723.000 users[1].

The growth of premium-users is described with different scenarios.

- Pessimistic scenario: 5% premium-users

- Realistic scenario: 10% premium-users

- Optimistic scenario: 20% premium-users

Based on this, a turnover forecast for CityMob was calculated in respect to the three scenarios. These number consist of income from the customer (city magazines pays a monthly fee and a one time payment to CityMob) and the incomes from premium users. Figure 13.7 shows the expected development of the turnover for the next three years.

Apart from the cost of personnel, the normal operating costs, and the cost of the technical infrastructure, CityMob's costs consist of payments to the 3rd party service providers.

Among the 3rd part provider costs is premium-SMS. CityMob will use premium-SMS in order to bill premium users. The premium-SMS providers, calculate with a cost on around 1,3 Euro per subscription. Furthermore the cost for map material will be around 0,2 cent per request by user. From these numbers a turnover profitability of about 5% is calculated as a realistic scenario. Detailed data of the calculation is provided in appendix C, Section 13.11.3.

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[1]See external appendex for detailed calculation
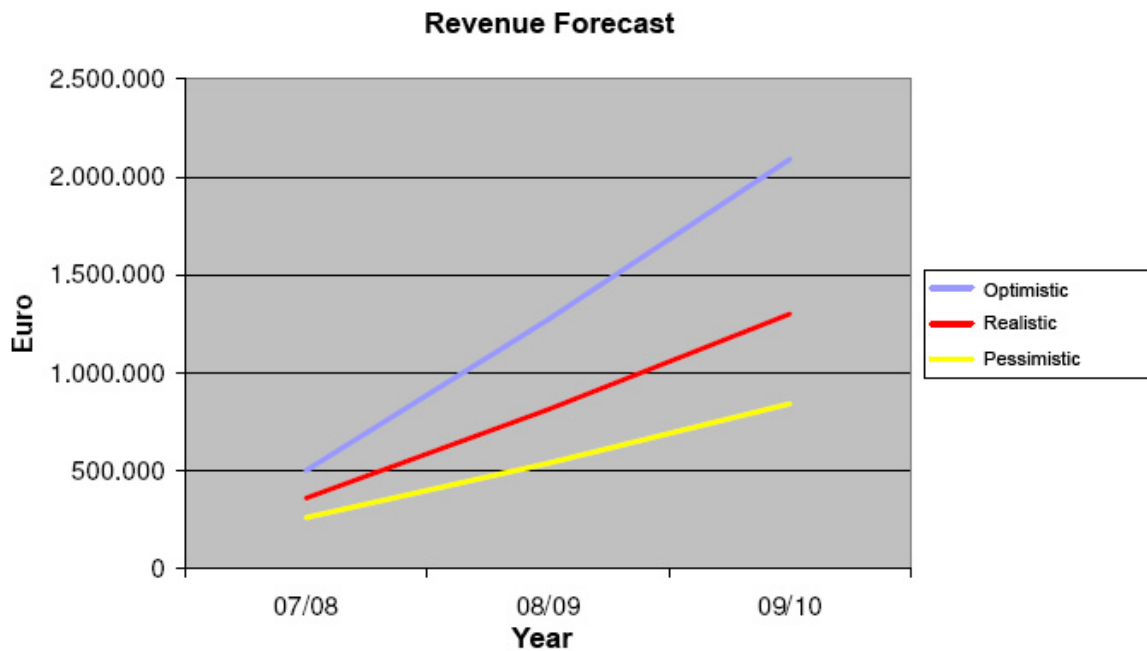
Figure 13.7: Revenue Forecast

Liquidity Planning

Due to the knowledge of the company owners, the income from the city
magazines (customers) and the collaboration with UnternehmerTUM (provides
CityMob with office space and communication infrastructure), CityMob has no
difficulties in the liquidity planning for the first three financial years. Figure
13.8 clarifies the liquidity planning for the realistic scenario, all further data is
in appendix B, Section 13.11.2.

Income and Loss Statement

The income and loss is computed for the three scenarios and shows the
operating profit dependent on the number of the premium users. For the
realistic and optimistic case the break even point is already reached in the first
year, in the pessimistic case only in the third financial year. Figure 13.9 clarifies
the process of the income and loss statement over the three financial years.

The detailed income and loss statement is found in appendix C, Section
13.11.3. Here is cost in regards to basic/operating materials not included, but
the variable cost for billing of premium users and licensing cost for maps is
included. Further the expenditures covering usual operating expenditures such
as marketing and development costs as well as further fixed costs and use of 3rd

		01.08.2007	01.09.2008	01.10.2009
	Start-up Capital	25000	59658,95	239592,71
	Current Account	0	0	0
+	Additional cash Raised	0	0	0
+	Payments and Sales (0 Day)	360792,35	812844,59	1302028,02
+	Interest (0%)	0	0	0
+	Financial Resources	0	0	0
=	Total Capital	360792,35	812844,59	1302028,02
-	Raw Materials and Supplies / Purchase	57808,45	246636,53	442621,34
-	Wages	181200	210000	238800
-	Investments	0	0	0
-	External financing	0	0	0
-	Fixed Expenditure	87124,95	166477,01	243154,33
-	Variable Expenditure	0	0	0
-	Tax on Profits (35%)	0	9797,29	60980,86
=	Total Liabilities	326133,4	632910,83	985556,53
=	Total Turnover	59658,95	239592,71	556064,2

Figure 13.8: Realistic scenario for liquidity plan for CityMob

party services. (Billing system, map material and WAP Push message).

13.11   Appendix

13.11.1   Appendix A
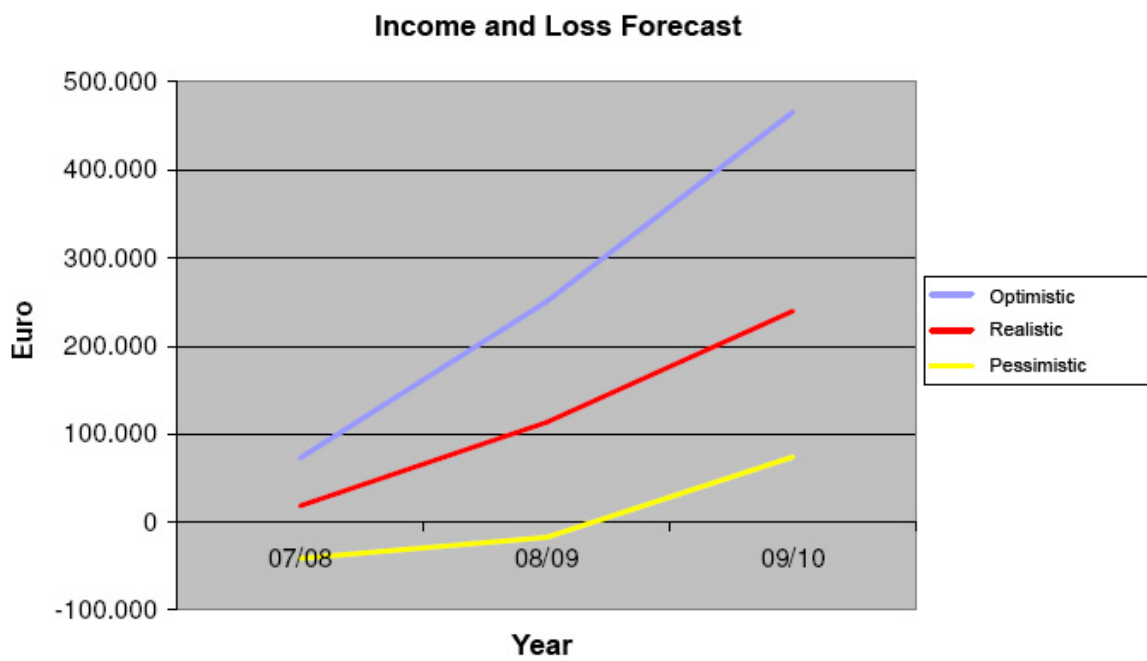
Figure 13.9: Income and Loss

Köln	Karneval	January	2008
Düsseldorf	Karneval	January	2008
Bonn	Karneval	January	2008
Hannover	Cebit	March	2008
Leipzig	Energy Club Zone	April	2008
Berlin	Christopher Street Day	June	2008
Stuttgart	MTV Hip Hop Open	July	2008
Hamburg	Alstervergnügen	August	2008
Frankfurt a.M.	Museumsuferfest	August	2008
Dortmund	Loveparade	August	2008
München	Octoberfest	September	2008
Bremen	Freimarkt	October	2008
Essen		December	2008
Nürnberg	Fasching	February	2009
Dresden	Filmfest	April	2009
Berlin	Karneval der Kulturen	May	2009
Bochum	Bochum Total Musikfestival	June	2009
Dortmund	Juicy Beats	July	2009
Hannover	Schützenfest	July	2009
köln		August	2009
Duisburg		August	2009
Hamburg	Studenten-Erstsmesterpartys	October	2009
Frankfurt a.M.	Erstsemster	October	2009
Stuttgart	Cannstadter Wasen	October	2009
Essen		November	2009
Düsseldorf		December	2009
Bielefeld		February	2010
Wuppertal		March	2010
Mannheim		April	2010
Bremen		April	2010
Kiel	Kieler Woche	June	2010
Leipzig		June	2010
Duisburg	Loveparade	August	2010
Dresden		October	2010
Nürnberg		December	2010

Figure 13.10: Customer strategy approach

13.11.2   Appendix B

CityMob
Cash Flow - optimistic

		01.08.2007	01.09.2008	01.10.2009
	Capital	25000	143204,59	505051,83
	Current Account	0	0	0
+	Additional cash Raised	0	0	0
+	Payments and Sales (0 Day)	502145,11	1270635,58	2092246,05
+	Interest (0%)	0	0	0
+	Financial Resources	0	0	0
=	Total Capital	502145,11	1270635,58	2092246,05
-	Raw Materials and Supplies / Purchase	115615,57	493273,06	885241,35
-	Wages	181200	210000	238800
-	Investments	0	0	0
-	External financing	0	0	0
-	Fixed Expenditure	87124,95	166477,01	243154,33
-	Variable Expenditure	0	0	0
-	Tax on Profits (35%)	0	39038,27	134884,92
=	Total Liabilities	383940,52	908788,34	1502080,6
=	Total Turnover	143204,59	505051,83	1095217,28

Figure 13.11: Optimistic cash flow analysis

CityMob
Cash Flow - likely

		01.08.2007	01.09.2008	01.10.2009
	Capital	25000	59658,95	239592,71
	Current Account	0	0	0
+	Additional cash Raised	0	0	0
+	Payments and Sales (0 Day)	360792,35	812844,59	1302028,02
+	Interest (0%)	0	0	0
+	Financial Resources	0	0	0
=	Total Capital	360792,35	812844,59	1302028,02
-	Raw Materials and Supplies / Purchase	57808,45	246636,53	442621,34
-	Wages	181200	210000	238800
-	Investments	0	0	0
-	External financing	0	0	0
-	Fixed Expenditure	87124,95	166477,01	243154,33
-	Variable Expenditure	0	0	0
-	Tax on Profits (35%)	0	9797,29	60980,86
=	Total Liabilities	326133,4	632910,83	985556,53
=	Total Turnover	59658,95	239592,71	556064,2

Figure 13.12: Realistic cash flow analysis

CityMob
Cash Flow - pessimistic

		01.08.2007	01.09.2008	01.10.2009
	Capital	25000	0	29974,71
	Current Account	0	-9551,8	0
+	Additional cash Raised	0	0	0
+	Payments and Sales (0 Day)	262684,28	539568,39	842942,01
+	Interest (0%)	0	0	0
+	Financial Resources	0	0	0
=	Total Capital	262684,28	539568,39	842942,01
-	Raw Materials and Supplies / Purchase	28903,56	123318,93	221310,67
-	Wages	181200	210000	238800
-	Investments	0	0	0
-	External financing	0	0	0
-	Fixed Expenditure	87124,95	166477,01	243154,33
-	Variable Expenditure	0	0	0
-	Tax on Profits (35%)	0	0	0
=	Total Liabilities	297236,08	500041,88	703265
=	Total Turnover	-9551,8	29974,71	169651,72

Figure 13.13: Pessimistic cash flow analysis

13.11.3   Appendix C

CityMob
Profit and Loss- optimistic

		01.08.2007	01.09.2008	01.10.2009
	Sales revenue	502145,11	1270635,58	2092246,05
+	inventory increase	0	0	0
-	raw materials and supplies	115615,57	493273,06	885241,35
=	gross profit or loss	386529,54	777362,52	1207004,7
-	salaries expenditures	181200	210000	238800
-	depreciation and amortization of fixed assets	6666,67	15500	8831,33
-	accruals and deferrals	0	0	0
-	other expenditure	87124,95	166477,01	243154,33
=	operating income	111537,92	385385,51	716219,04
+	interest 0%	0	0	0
-	interest payable	0	0	0
=	net operating profit after taxes	111537,92	385385,51	716219,04
-	loss brought forward	0	0	0
=	annual net profit	111537,92	385385,51	716219,04
-	profits tax 35%	39038,27	134884,92	250676,66
=	balance sheet profit/loss	72499,65	250500,59	465542,38

Figure 13.14: Profit and Loss calculation, Optimistic scenario

		01.08.2007	01.09.2008	01.10.2009
	Sales revenue	360792,35	812844,59	1302028,02
+	inventory increase	0	0	0
-	raw materials and supplies	57808,45	246636,53	442621,34
=	gross profit or loss	302983,9	566208,06	859406,68
-	salaries expenditures	181200	210000	238800
-	depreciation and amortization of fixed assets	6666,67	15500	8831,33
-	accruals and deferrals	0	0	0
-	other expenditure	87124,95	166477,01	243154,33
=	operating income	27992,28	174231,05	368621,02
+	interest 0%	0	0	0
-	interest payable	0	0	0
=	net operating profit after taxes	27992,28	174231,05	368621,02
-	loss brought forward	0	0	0
=	annual net profit	27992,28	174231,05	368621,02
-	profits tax 35%	9797,29	60980,86	129017,35
=	balance sheet profit/loss	18194,99	113250,19	239603,67

Figure 13.15: Profit and Loss calculation, realistic scenario

CityMob
Profit and Loss- pessimistic

		01.08.2007	01.09.2008	01.10.2009
	Sales revenue	262684,28	539568,39	842942,01
+	inventory increase	0	0	0
-	raw materials and supplies	28903,56	123318,93	221310,67
=	gross profit or loss	233780,72	416249,46	621631,34
-	salaries expenditures	181200	210000	238800
-	depreciation and amortization of fixed assets	6666,67	15500	8831,33
-	accruals and deferrals	0	0	0
-	other expenditure	87124,95	166477,01	243154,33
=	operating income	-41210,9	24272,45	130845,68
+	interest 0%	0	0	0
-	interest payable	7,57	245,94	0
=	net operating profit after taxes	-41218,47	24026,51	130845,68
-	loss brought forward	0	41218,47	17191,96
=	annual net profit	-41218,47	-17191,96	113653,72
-	profits tax 35%	0	0	39778,8
=	balance sheet profit/loss	-41218,47	-17191,96	73874,92

Figure 13.16: Profit and Loss calculation, pessemistic scenario

Prototype

In this chapter it will be explain and documented the prototype that was developed. It will be exposed a high level system overview to show what entities are part of the solution for the prototype, as well as their interaction and communication purpose. Furthermore, a detailed overview of the prototype with two approaches: the client and the server will be presented. The prototype's source code can be found in the external appendix.

The prototype consists mainly of a client and a server. The client is a J2ME application called *"MyCityGuide"*, built on the play.Tools framework, and the server is built on the PlayBox Framework and has been given the name *"CityMob Service Manager"*.

14.1   Background

Because CityMob neither have any references nor previous work to show to, building a prototype was considered to be necessary before contacting city magazines. A demonstration of a working prototype accurately explains the business idea, but maybe most importantly, it proves that CityMob is capable of developing a final solution.

The prototype described here is an example of how the content from one city magazine, in this case Munichx (`www.munichx.de`), can be adapted and brought to a mobile phone, giving users ubiquitous and easy access to the information provided by Munichx, coupled with additional features and services such as context-awareness and map functions.

The prototype is furthermore build on the scenarios given in 2.2, the market research in chapter 12 and in close relationship with some pilot users, read more in the complementing Master thesis [1].

14.2 Use Case Diagrams

A use case is a technique for capturing functional requirements of systems. Building use cases is usually done after defining scenarios, and is a mean to summarize the scenarios. Each use case represents a certain type of functionality and can therefore describe many scenarios. These use cases are meant to illustrate the final product, and the prototype does not necessarily include all the functionality exposed here.

14.2.1 Updating the Database of a Content Provider

Figure 14.1 shows a simple scenario where the content provider needs to update the database. This database is the one that provides information to the *MyCityGuide*. The idea behind this scenario is that the task of updating a database for the *MyCityGuide* should be as easy as possible. Since a content provider already has his own database providing content to his website, and since the *MyCityGuide* will need to have access to this content without being aware of the database belonging to the content provider, a solution that does not induce more work for the content provider must be worked out. It is not conceivable to ask a content provider to deal with two different databases, and every update that the content provider makes should be independent of our solution and should not involve more work than he had before.

14.2.2 Functionality on the Client Side

The next use case shown in figure 14.2 is meant to reflect the basic functionality of the *MyCityGuide*. This includes searching for content based on the context and user specified search criteria, adding elements to favourites, accessing previous searches, and accessing map and subway information. It is interesting to note that search and map and subway information are context aware functions. At this stage of the development process, CityMob limited the context information for these functions to location. Other context elements will be exposed in the next chapter when the final product is detailed.

14.2.3 Other Functions

Figure 14.3 illustrates two functions that are of interest for the *MyCityGuide*. The first relates to the possibility for a user to generate content that in turn
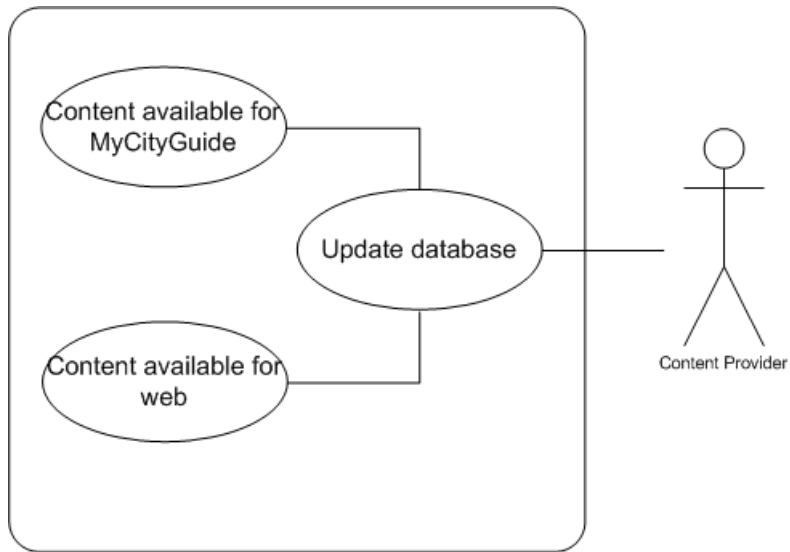
Figure 14.1: A content provider updates his database
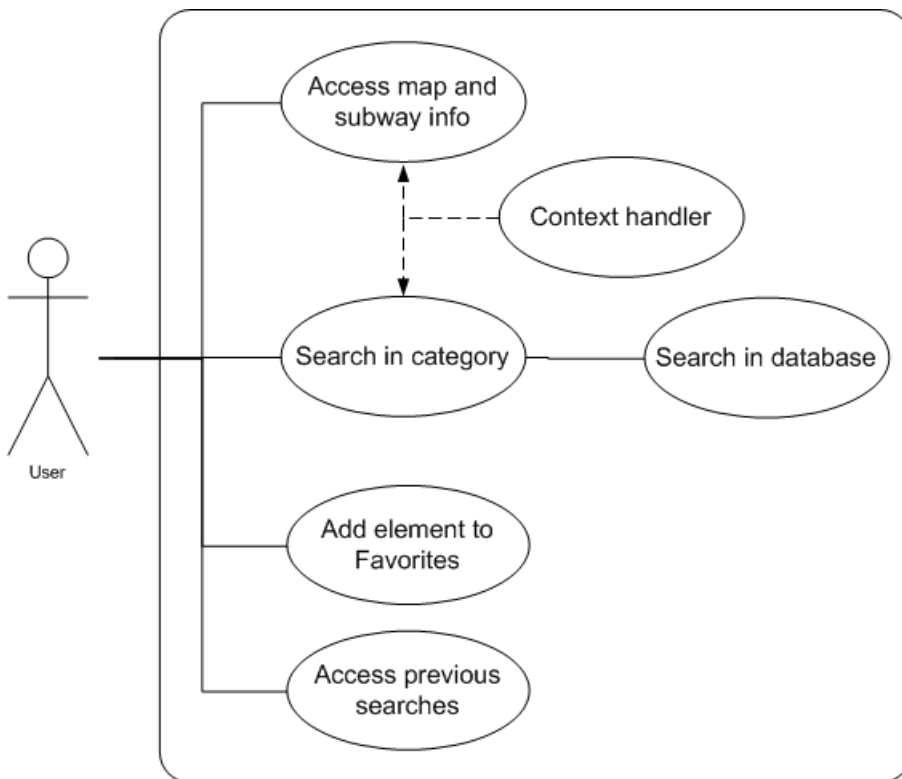
Figure 14.2: Use case - Basic functionality

could be made available to other users. This could for instance be the possibility to rank a restaurant. The second function relates to the possibility to push information or available services to the user. This could be information or services based on the context of the user and his preferences. For example, if the user approaches a GPS device, he could get a notification about this and be asked if he wants to use the device.

14.3 System Overview

CityMob will now proceed with a high level system overview of the solution framework for the prototype, as seen in figure 14.4. There are two main elements that compose the framework, namely the MyCityGuide application and the CityMob Service Manager.

The content is taken from the Munichx website and entered manually into the of the CityMob Service Manager. This content is then made accessible to the MyCityGuide mobile application through web services. The MyCityGuide has also access to subway information through a http connection, as well as the position of the device through an external GPS device and a Bluetooth connection. Finally, the MyCityGuide has access to a map, via the CityMob Service Manager, by the mean of web services.

14.4 Detailed System Description

Figure 14.5 shows a deployment diagram of the prototype with a focus on the server side. The components that are part of the prototype are exposed and will be further explained.

ApplicationData

This component, implemented on the client side, is responsible for interacting with the server. It uses web services and is able to send requests to the MyCityGuideService. The ApplicationData component is also responsible for login to the server.

Map2CmdListener

This component, implemented on the server side, is responsible for the map functionality provided to the MyCityGuide. It communicates with the MapService implemented on the server side. The Map2CmdListener is part of the play.Tools Framework, with specific adaptations to the prototype.
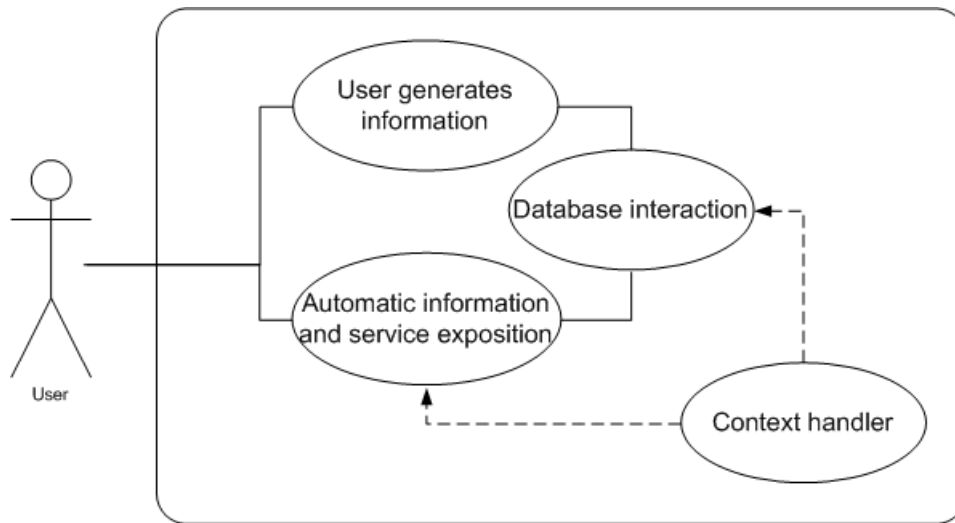
Figure 14.3: Use case - Other functionality
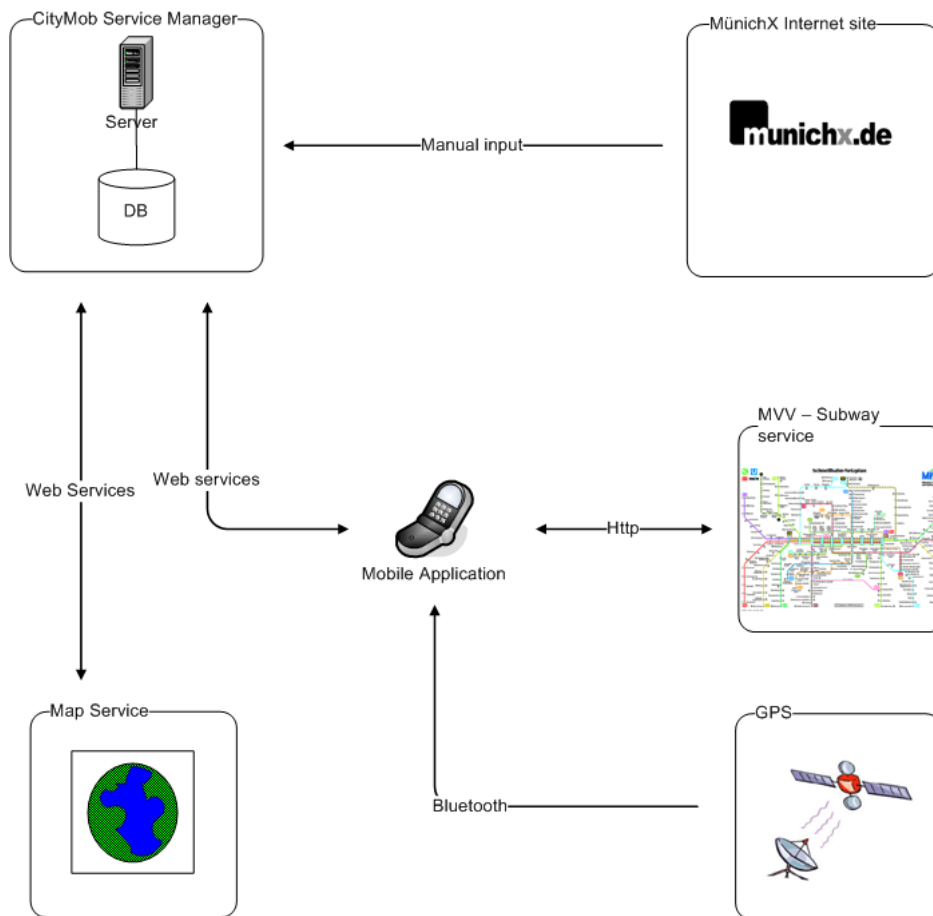
Figure 14.4: Overview of the Prototype solution
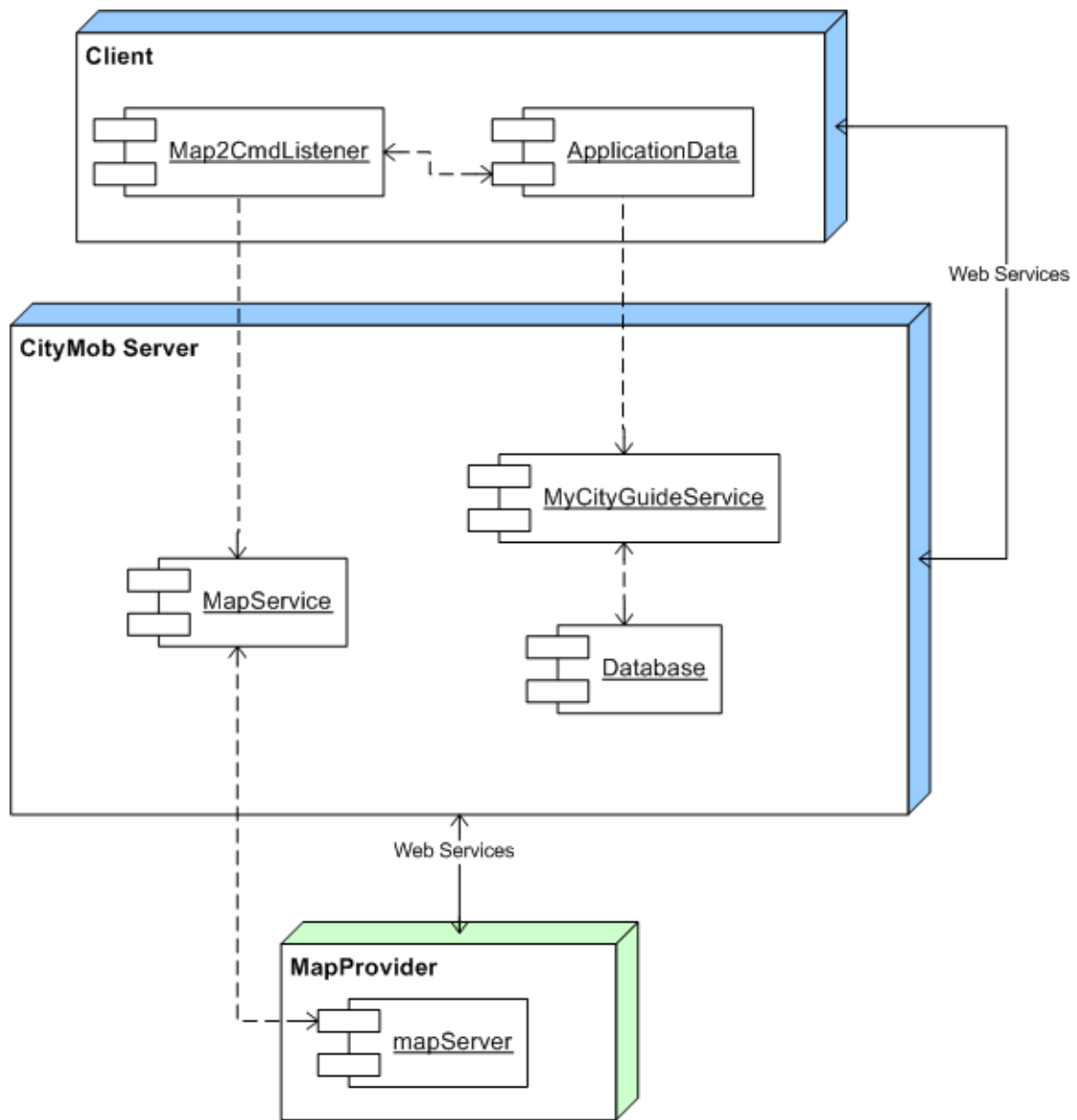
Figure 14.5: Deployment diagram from the server viewpoint

MapService

This component is part of the PlayBox Framework and permits the access through web services to maps. These maps are taken from a map provider, and are provided free of charge for non-commercial usage.

MyCityGuideService

The MyCityGuideService serves as an interface for the client to the data that is on the server. The communication is done through the use of web services, and the MyCityGuideService provides the client with a set of requests that it can call. Upon request, the MyCityGuideService accesses the database, extracts the relevant data, and sends a service response back to the client. The MyCityGuideService is also responsible for the security aspects and provides a login mechanism to the client.

Database

The database was designed to support the content of Munichx, and can be accessed by the MyCityGuideService.

14.5   The CityMob Server

The CityMob Server is built upon the PlayBox framework. It uses a MySql database, Hibernate, and permits an easy implementation of web services. CityMob started by showing the details of the database, its entities and relationships. Then it was shown how tables in the database are mapped to Java classes. Finally, it was looked closer at the MyCityGuideService that permits interaction between a client and the server.

14.5.1   The Database

Figure 14.6 shows the database design that was used for the prototype.

The database is built with respect to the content of Munichx. Every searchable element belongs to either of the following entity types: place (eg. a restaurant), city_event (eg. an art exhibition), cinema and movie. Furthermore, each event and cinema belongs to a specific place and each place has an address. Every cinema can have one or more movies, and each place, event and movie also have a poll value.

The database was built to support the content of Munichx for the sake of the
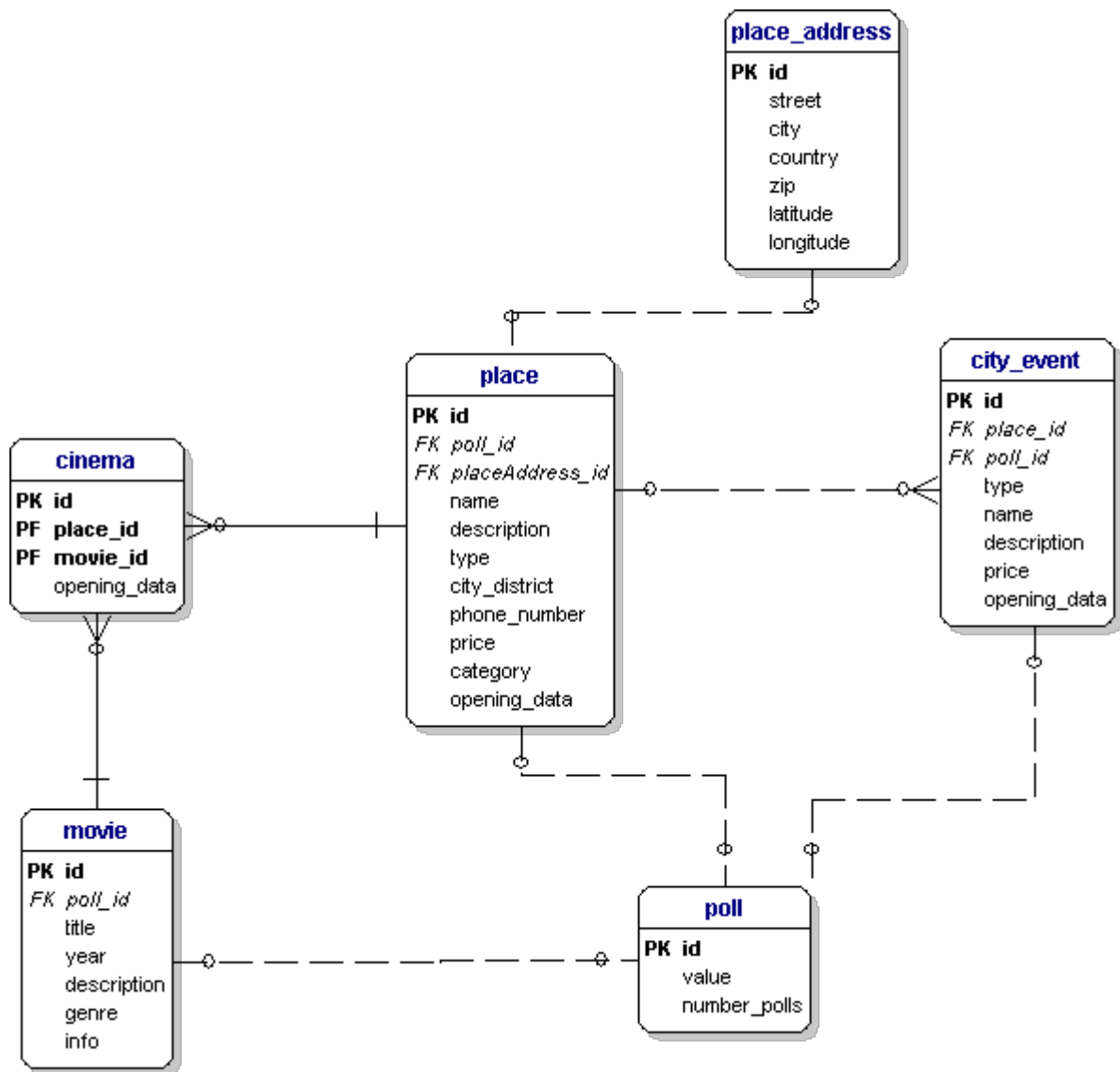
Figure 14.6: Diagram of the prototype database

prototype. It does not reflect any future database design, and many optimization issues were left behind. It does however cover the needs of the prototype, giving the MyCityGuide application full access to content that was taken from the Munichx website and manually fed to the database.

14.5.2   Hibernate Mapping

The server uses the object / relational persistence and query service for java called hibernate. This means that for each table in the database, CityMob have defined a class that has access to the table. For the sake of simplicity CityMob will limit us to one class, namely the CityEvent class; however the complete class diagram can be found in appendix A. Figure 14.7 shows the xml hibernate mapping file, and figure 14.8 shows the CityEvent class. It can be noticed that the attributes in the CityEvent class are the same as the keys in the city_event database table. The CityEvent class has get ans set methods for each of these keys. Furthermore, the CityEvent class can access other classes such as the Poll class; the Poll class being the class that maps the poll database table. This way, CityMob creates relationships between tables, and the CityEvent class is able to access the poll table.

The benefit of this approach is that it gives us access the database without having to deal with SQL queries.

14.5.3   The MyCityGuideService

Figure 14.9 shows the interface for the MyCityGuideService. This interface defines the web services that is made accessible to both server internal services and remote calls. Each method call to the MyCityGuideService returns an object. These objects are remote objects that in our case are the same objects that map the tables in the database.

The MyCityGuideService implements four methods that makes it possible to:

- Search for events according to the type of event and the day
- Search for places according to the type of place (restaurant, night club,...), the city district and the category of the place if any
- List the available movies
- List the available cinemas

These methods are not optimal for any future use of the MyCityGuideService, but they serve the purposes of the prototype sufficiently. The two latter methods were provided for the sake of completeness more than functionality,

```
<?xml version="1.0"?>
<!DOCTYPE hibernate-mapping PUBLIC
            "-//Hibernate/Hibernate Mapping DTD 3.0//EN"
            "http://hibernate.sourceforge.net/hibernate-mapping-3.0.dtd">


<hibernate-mapping>
        <class name="de.unternehmertum.playbox.model.CityEvent" table="city_event" lazy="false">
                <id name="id" column="id">
                        <generator class="native"/>
                </id>
                <property name="type"/>
                <property name="name"/>
                <property name="description"/>
                <property name="price"/>
                <property name="opening_data"/>

                <many-to-one name="poll" column="poll_id" update="false" unique="true" class="de.unternehmertum.playbox.model.Poll"/>
                <many-to-one name="place" column="place_id" update="false" unique="true" class="de.unternehmertum.playbox.model.Place"/>


        </class>
</hibernate-mapping>
```

Figure 14.7: Hibernate mapping file for the city_event database table

CityEvent
Attributes
private long id
private String type
private String name
private String description
private String price
private String opening_data
private long place_id
private long poll_id
Operations
public long getId( )
public String getType( )
public String getName( )
public String getDescription( )
public String getPrice( )
public Poll getPoll( )
public void setId(long l)
public void setType(String string)
public void setName(String string)
public void setDescription(String string)
public void setPrice(String string)
public void setPoll(Poll l)
public Place getPlace( )
public void setPlace(Place place)
public String getOpening_data( )
public void setOpening_data(String date)
public void setPlace_id(long place_id)
public long getPlace_id( )
public void setPoll_id(long poll_id)
public long getPoll_id( )

Figure 14.8: CityEvent class that maps the city_event database table

```
                          <<interface>>
                       MyCityGuideService

                            Attributes

                            Operations
public CityEvent[0..*]  searchEvents( String type, String opening_data )
public Place[0..*]  placeSearch( String type, String city_district, String category )
public Movie[0..*]  listAllMovies( )
public Cinema[0..*]  listAllCinemas( String movieName )
```
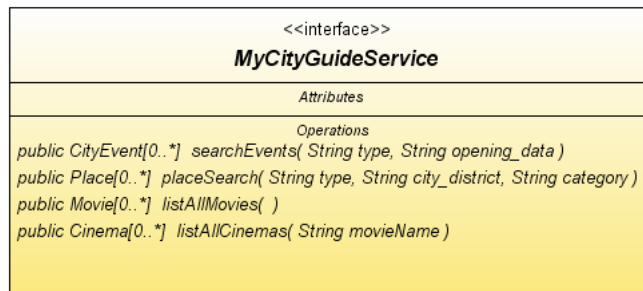
Figure 14.9: MyCityGuideService - interface

since the Client does not implement them. A complete class diagram for the
MyCityGuideService can be found in appendix A.

14.6 The Client - GUI

CityMob will now relate to the GUI of the MyCityGuide. The GUI was the
result of the work of paper prototyping and testing, as well as related issues
from the literature. As mentioned before, the MyCityGuide satisfies the
content and information structure of our first potential customer, Munichx.

14.6.1 Main Themes

Some main themes for the application were agreed upon during the design
phase. It is important for a product to follow certain principles that the user
recognizes and gets used to. Nothing should diverge too much from these
principles.

Colors

Colours and the most typical aesthetic design issues have not been debated in
this thesis. Even so it is an important part of the design phase. It was chosen,
to mostly stick with the colours black, grey, white and red. On the main menu
CityMob let the different icons have distinct colors, on top of the black
background. The main idea was to make the user mentally link the colours
with the functionality underneath.

Pop-up logic

The background for the application is black. CityMob can see this in the main
menu, the search page and the search result page. When CityMob wanted

something to look like a pop-up, CityMob made the background white. The element pop-up for instance (see Figure 14.11), has a white background. This should make it easy for users to separate a pop-up from the rest of the application.

Tabs

CityMob decided early on to make use of the tabs functionality. This is mostly because we found it to be a very good way of displaying information on the limited mobile screen. When the information is logically set up it allows the developer to organise information horizontally and not only vertically. Tabs is used in the last searches menu and on the element information pop-up.

14.6.2   Main Menu

The main menu of the application is icon based. Up, down, left and right keys enables the user to switch icon. The infobar on top of the screen discribes what the highlighted icon represents. Pressing the left softkey or the fire button takes you to the functionality of the highlighted icon.

The top six icons represent catagories. CityMob use the categories that munichx.de uses. The different categories are (from top left on figure 14.10):

- **Essen** The restaurants of Munich.

- **Planen** Includes all events exept cinema. These events are parties, conserts, comedy, theatre, classical music, art, sport and fairs.

- **Trinken** The places were you can take a drink in Munich. This includes cafes, bars as well as Biergartens.

- **Sehen** Whats on in the cinemas?

- **Tanzen** The discos and clubs of Munich.

- **Hören** Includes the concert events. Overlaps with Planen.

The bottom line icons include some additional functionality. Firstly there is a map icon for general map functionality. Only some functionality is included here for the prototype. This includes using the GPS, and showing current location on a map. The next icon is the last search icon. It shows the last five search results, regardless of category. The last icon is a favourites icon. The
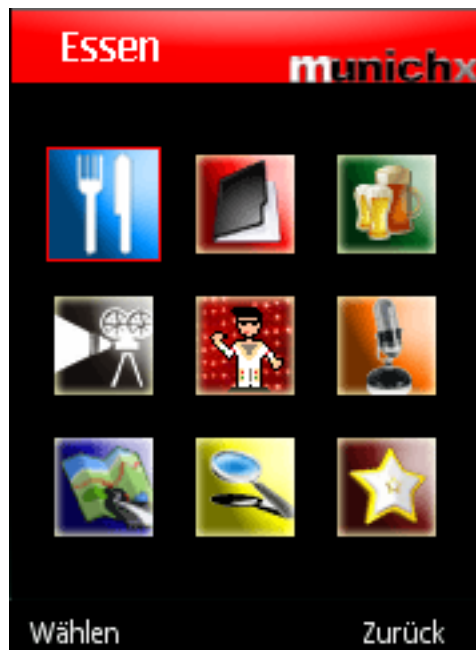
Figure 14.10: The main menu

functionality of favourites, was not implemented in the prototype.

14.6.3 Searching

The search functionality is one of the most important functionalities implemented in our prototype. Our search pages consisted of two to four buttons. How many buttons used depended on the how many search parameters the category demanded. (For instance three buttons for restaurant. One for restaurant type, one for city district and one search button.) The lower button was always the search button. Highlighting it and pressing left softkey or fire key initiates the search. The above buttons let the user specify their search. When choosing one of them a pop-up will be displayed showing the available alternatives (see middle picture on figure 14.12).

Search results are displayed in a scrollable list. For the prototype, no specific logic for the order in which to display them was implemented. To choose an element on the list the user has to highlight it and press left softkey or the fire button. For the finished application CityMob implemented an additional infobar that shows what the search result is, for instance "Italian restaurant in Schwabing".

Figure 14.11: Screenshoots of application 1 - Leftmost picture shows the searchpage. Middle picture shows pop-up where type of restaurant can be chosen. Rightmost picture shows search results.

14.6.4 Displaying Elements

The user can search for places (for instance restaurants) and events (for instance concerts). The information pop-up displayed when selecting a place is a little bit different from the one for events, but they are mainly the same. The element information pop-up consists of two tabs with different information. The first tab, the "was"-tab holds the most used information and functionality. Topmost some important information is displayed like address, telephone number and ranking. Underneath is some selectable functionality. Call functionality is implemented here, as well as the option of ranking and also adding to favorites. Additionally map functionality is available. Selecting "Standort" takes you to a map where the current place or the place of the event is shown.

14.6.5 Map Functionality

The map functionality implemented in the prototype is limited. Some programming difficulties that CityMob didn't spend time to try to overcome, limited the functionality even more. This was also the part that the participants in the prototype testing liked the least. As of now, the functionality is the following: Left or right soft key must be pressed to view an options pop-up menu. From this menu users can choose to zoom in and out or to close the map. Major improvements will be made for the finished product.

Figure 14.12: Screenshoots of application 2 - Left picture shows the "was" part of the element pop-up. Right picture shows the "warum" part of the element pop-up.
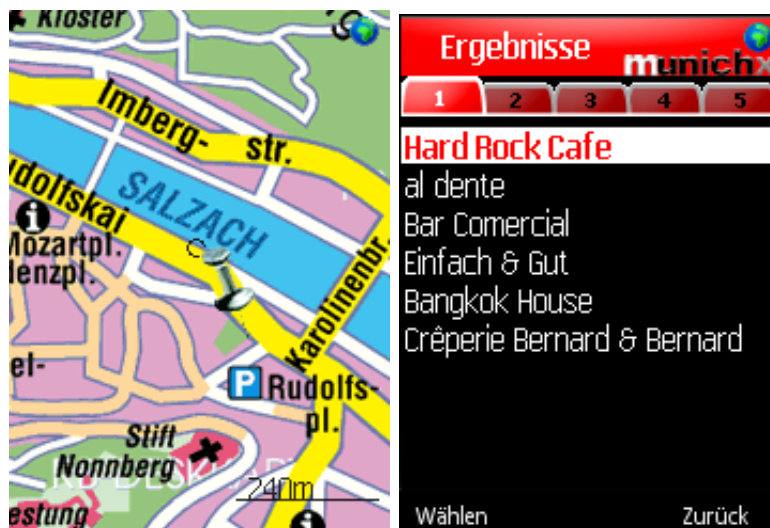
Figure 14.13: Screenshoots of application 3 - The left picture shows a screen shot of the map. The right picture shows the last search menu.

14.6.6   Last Searches

The last searches page is selectable from the main menu. This functionality
together with the favourites, will secure the most important off-line
functionality of the application. The last search page consists of five tabs, each
displaying one of the five last searches made, independent of category. Selecting
an element starts a pop-up showing the element. The additional info bar
planned for the finished application showing what the search result is of (for
instance "Italian restaurant in Schwabing"), will come in handy here.

14.7   Client - Class Diagram

Figure 14.14 shows the class diagram for the client with all the classes main
attributes and methods. It will here briefly be explained the main functions of
each class.

ApplicationData

This class is responsible for the storing the data that the application needs. It
uses the RecordStore class of J2ME giving the application persistent storage
possibilities. The class also serves as a logical unit that coordinates the different
classes. It also ensures server communication with the CityMob Server: for
security aspects, the ApplicationData class uses the SecurityCmdListener; for
service requests it uses the MyCityGuideService (implemented on the client,
not to be mistaken with the MyCityGuideService implemented on the server).

GpsCmdListener

This class is responsible for dealing with GPS functionality and provides
coordinates as well as connectivity status to the application.

BluetoothCmdListener

This class is responsible for dealing with bluetooth devices. When invoked, it
searches for surrounding bluetooth devices and gives the user the possibility to
establish a connection. For the prototype, this class was used to handle an
external GPS device.

SecurityCmdListener

This class provides login to the CityMob Server. The ApplicationData uses this
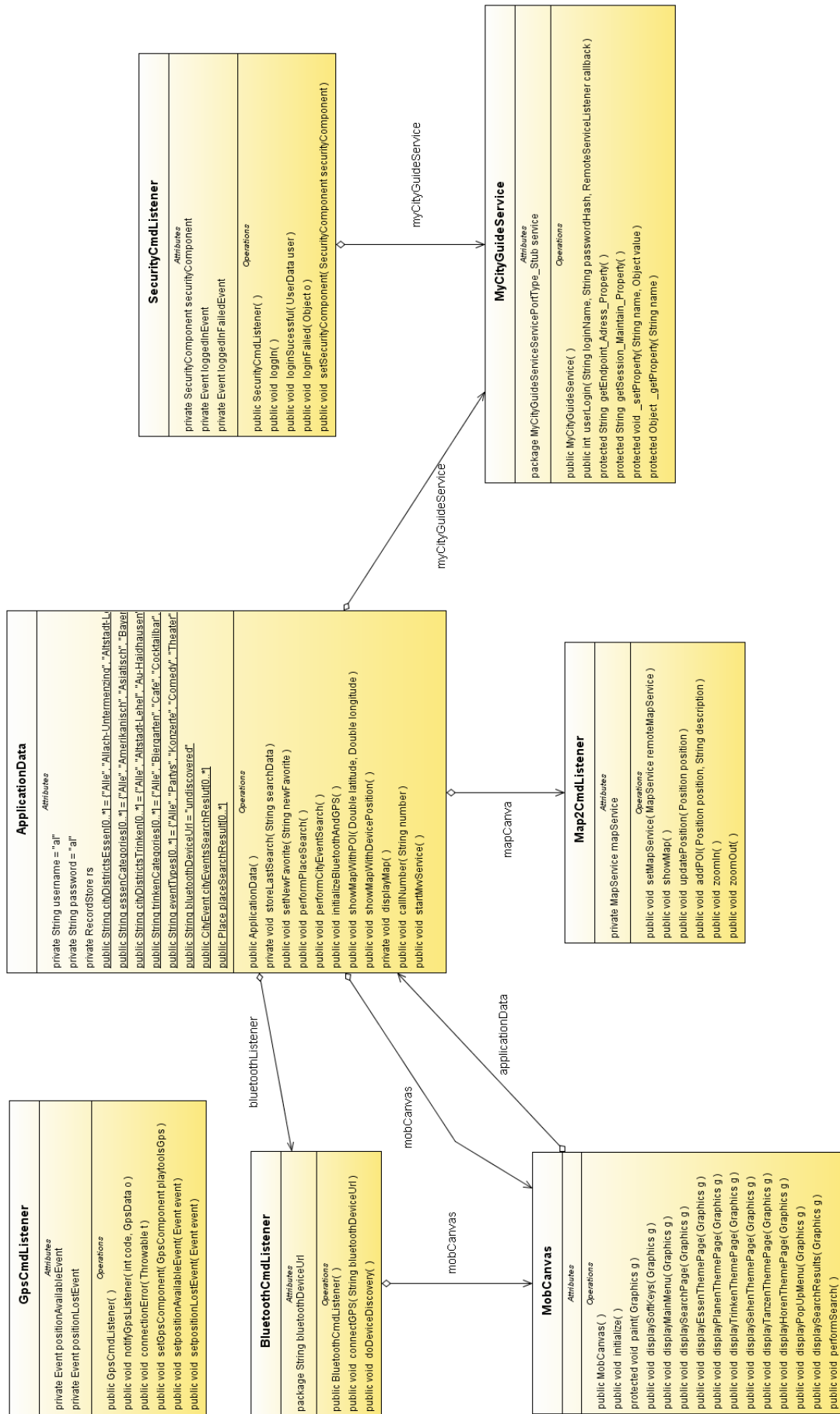
Figure 14.14: Class diagram - Client

class to identify and log itself on to the server.

MyCityuideService

This class holds the logic that permits requests to the MyCityGuideService implemented on the server. It also gives the application access to remote classes that are defined on the server.

Map2CmdListener

This class is responsible for displaying the map. It uses web services to communicate with the CityMob Server to retrieve map data.

MobCanvas

This class is responsible for the graphical user interface of the application. It uses the J2ME Canva class, giving it a flexible and adapted user interface. It is also responsible for dealing with user input such as a press on a soft key.

Pilot Customer - Munichx

After the comprehensive market research towards city magazines and the end-users, which is described in Chapter 12, Munichx was chosen as the best suitable pilot customer for CityMob. The market research was carried out in an early phase of the project. However, CityMob did not want to contact Munichx before a working prototype of MyCityGuide could be demonstrated.

This chapter looks at how CityMob approached their pilot customer Munichx and how the two companies initiated a collaboration. Moreover, in order to provide public transport information, additional collaborations are needed. CityMob's arrangement with Munich traffic and tariff group (MVV) is also outlined.

15.1 Background

To get "proof of concept", Munich was, as discussed in the business plan in Chapter 13 and in the market research in Section 12.2, found to be the city most suited for the penetration approach in regards to CityMob's team and idea. For the execution of the business plan, Munichx was identified as the most preferred city magazine to start a partnership with.

Munichx is a popular city magazine on the Internet. It covers information about restaurants, cinema, concerts, new music releases, night life, parties, meetings and other topics which take place in Munich.

Beside detailed information about restaurants, readers can read critiques and articles, check for current concerts and the party calendar. Also, services such as booking, ticket purchase and the complete cinema program for Munich and its surrounding area is available from the portal. For more information see section 12.2.

Visitors October 2006:

- Unique Visitor 456.822
- Page Impressions 1.647.345

15.2   Contacting Approach

15.2.1   XING

XING is a business oriented social software platform, mainly used for professional networking. The majority of users are German, but people from 190 countries are represented as users. Basic membership is free, but premium membership comes at a monthly fee around 6 USD. Xing's main competitor is Linkedin which is a American based company [2].

With Xing the user is able to [2]:

- Get in touch with new potential employees
- Get in touch with other companies
- See your contacts' contacts
- Market himself/herself
- Open up new sales channel
- Find old student friends and former colleagues
- Let other people find him/her
- Build a network of contacts

The CityMob members had early in the project created a Xing account. CityMob made their first contact with Mr. Gasteiger, CEO for Munichx.de through Xing.

15.2.2   Phone and Email

After an initial contact was made through Xing, contact by phone and email was the next step. CityMob sent a detailed overview of the project in a powerpoint presentation. Shortly after, a meeting was arranged at CityMob's office.
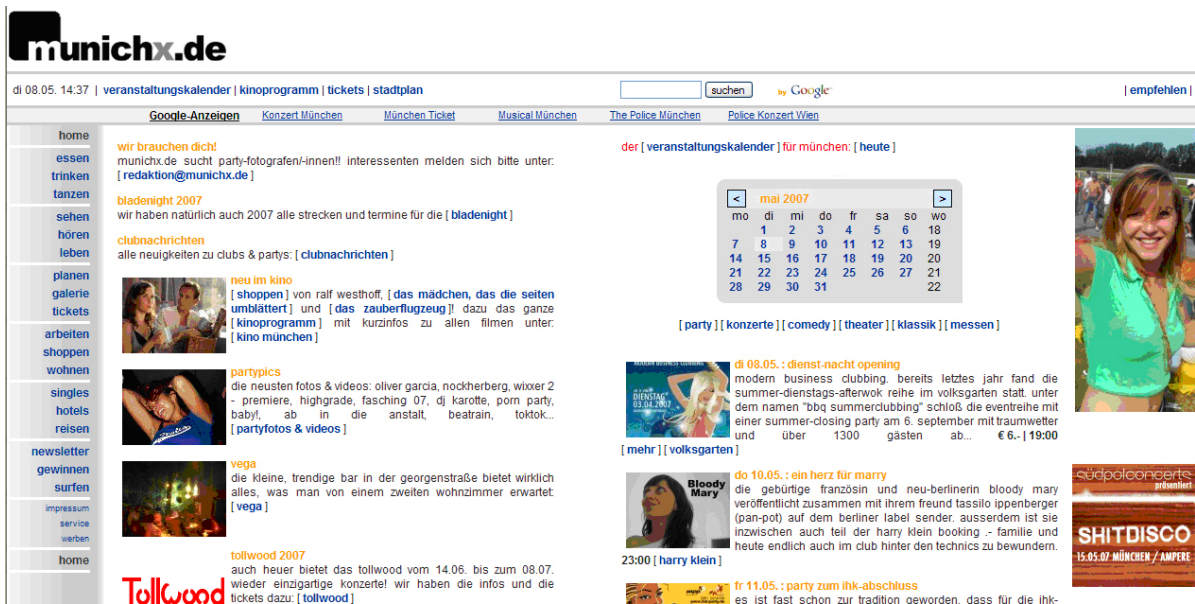
Figure 15.1: Munichx, city portal for Munich

15.3 Meetings with Munichx

This section will look more closely at the most important meetings held and agreements made between CityMob and their pilot customer Munichx.

15.3.1 Introduction Meeting Munichx 04.05.2007

Present

- CityMob: Petter, Axel
- UnternehmerTUM: Bernard Doll
- Munichx: Philipp Gasteiger (CEO)

Agenda

1. Presentation of CityMob
2. Project Portfolio
3. Munichx Mobile
4. Positioning and USP's
5. The viral effect
6. Operating platform CRM
7. Munichx Community
8. Munichx Web Portal
9. Contact

The goal

CityMob hoped to sell Munichx a service package, which includes the mobile city guide for Munich and a community service on the Web.

Background Munichx

Phillipp and Munichx had recently done some marketing research in order to increase their user base. Their were about to change their homepage and enhance it with some community functions. They also wish to have a mobile solution that can interact with their community.

The meeting

CityMob was presented as a company with the latest knowledge in technology, both in web and mobile technologies. Furthermore, the close relationship to the two universities TUM and NTNU were mentioned. The presentation was directed mostly at our mobile capability and our mobile solution. The MyCityGuide prototype was also demonstated and Phillipp was very pleased with everything that was mentioned in regards to the mobile application. For our community solutions, he was not convinced that this would be something they would need, since they don't want to compete against web-communities such as Lokalisten and MySpace. Furthermore, Munichx has own programmers who can build a community solution.

The presentation shown at the meeting, including the CityMob story (video), can be found in the external appendix.

Additional facts Munichx

- Munichx collect 90% of all their information themselves; only cinema information is bought by licensing. (This makes it easier to set up a revenue sharing model.)

- They have three different servers where the information is stored, which CityMob have to communicate with to retrieve data information

- The new Munichx web page:

  1. New category: Shopping

  2. Not one event calendar for all the venues, but one event calendar for each venue.

  3. Integration with mobile phones

- 60 % of their users are young women

- Want to expend to other cities

Additional functions to the mobile application

- Buddy lists

- Instant broadcasting of messaging within the application (Post-it functionality)

- Location of friends

- MVV offline

Remarks

It was a very casual tone at the meeting and the communication between the two parties went very well. Both parties appeared as they looked forward to collaboration. Mr. Gasteiger added that the timing was perfect for a mobile solution and that he did not think that it was going to be a problem to agree on a business model. The project will be considered as a reference project for CityMob.

The agreement for further work

- Send an email with suggestion of what the application should look like and a business model proposal. (Should be completed by next week)
- Meet the programmer
- Meeting to agree on a business model

The deadline for the production of the finished product was agreed to be at the end of September, with a release in connection to the Oktoberfest.

15.3.2 Business Meeting Munichx 25.05.2007

Present

- CityMob: Petter, Axel
- Munichx: Philipp Gasteiger (CEO)

Agenda

1. Business Model

Background

The purpose of the business meeting was, first of all, to come up with a business model that suites both parties. Since Munichx was a pilot customer

for CityMob, and because the project was considered to be a reference project, the business proposal from CityMob contained only modest demands.

The Meeting

Presented forecast for income on commercial and promotion:

Rrevenue share calculation using the media data from Munichx [47]:

- Price for the banner advertisement, 25 Euro
- Price for leader banner, 35 Euro
- Price for pop-ups, 60 Euro

The business model is based on a revenue sharing model of 70%-30%, Munichx - CityMob.

The application will have three main incomes from commercial:

1. Banner and pop-up, see figure 15.2

Sum banner and pop-ups:

- 1 000 users: 440 Euro
- 5 000 users: 2200 Euro
- 10 000 users: 4400 Euro

2. Promotion of companies, see figure 15.3

Always on top of search: 25 Euro TKP

Sum promotion:

- 1000 users: 300 Euro
- 5000 users: 1500 Euro
- 10 000 users: 3000 Euro

3. Promotion on favourites see figure 15.4

Pre-stored on favourite, 35 Euro TKP

Sum 10 pre installed favourites:

	Number	Price €	Income 1000	Income 5000	Income 10000
Banner	9	25	225	1125	2250
Lead banner	1	35	35	175	350
Pop-up	3	60	180	900	1800

Figure 15.2: Banner and pop-up

	Number	Price €	Income 1000	Income 5000	Income 10000
Promotion	12	25	300	1500	3000

Figure 15.3: Promotion of companies

	Number	Price €	Income 1000	Income 5000	Income 10000
Promotion	12	25	300	1500	3000

Figure 15.4: Promotion on favourites

- 1000 users: 350 Euro
- 5000 users: 1 730 Euro
- 10000 users: 3 500 Euro

Sum 50 pre installed favourites:

- 1000 users: 1 750 Euro
- 5000 users: 8 750 Euro
- 10000 users: 17 500 Euro

Summarize income from commercial and promotion:

10 pre installed favourites:

- 1000 users: 440 + 300 + 350 = 1 090 Euro
- 5000 users: 2200 + 1500 + 1 730 = 5 430 Euro
- 10000 users: 4400 + 3000 + 3500 = 10 900 Euro

100 pre installed favourites:

- 1000 users: 440 + 300 + 1 750 = 2 490 Euro
- 5000 users: 2200 + 1500 + 8 750 = 13 450 Euro
- 10000 users: 4400 + 3000 + 17 500 = 24 900 Euro

Business Model Suggestions

Because of CityMob's lack of experience, three different business models which would all be flexible in regards to Munichx's needs and preferred collaboration approach were presented.

The three different strategies were:

- Model 1: revenue sharing model: Munichx 70%, CtyMob 30%.

- Model 2: CityMob get a monthly sum + amount for each search.

- Model 3: Different amount pro number of users.

All three models would also include a fix payment of 3x3000 Euros.

Three payments:

- **Beginning** - To start the project

- **Gold master** - Finished prototype that both parts are happy with

- **Finished product** - Finished product

Results

Mr. Gasteiger found the numbers showing advertisement income realistic, but he had worries in regards to how the users would welcome advertisements on their mobile phone, and how they could be displayed in a good way on small screens. Furthermore he may have contact to some advertising agency that could help the two parts getting advertising customers to MyCityGuide.

Mr. Gasteiger, which represented Munichx, liked the first business model which was a revenue sharing model between the two parties. This was also the model that CityMob would prefer. It is considered to be fair to split the income. The amount of 9000 Euro was accepted by Mr. Gasteiger the 12 of June.

15.3.3   Technical Meeting Munichx 29.06.2007

Present

- CityMob: Petter, Axel
- Munichx: Philipp Gasteiger (CEO), Nicolay Sträter (Technical Director)

Background

The purpose of this meeting was first of all to talk about how to solve the technical issues between the two parts. For CityMob it was important to define the basic functionalities that Munichx wanted to include and a set with communication rules between the two parts. Previews meetings have been more focused on the business aspect of the collaboration.

The Meeting

In this meeting the two parts was introduced for each other technical teams. The challenges for the two parts would be for CityMob to integrate the data from Munichx; this will also include information from the new Munichx community. Communication with the two parts was agreed on through web

services. Munichx did also have latitude and longitude (GPS-data) data about their restaurants, clubs, bars and so on, so it will be easy to mark the different venues on a map and to use these data for other purposes.

Requirement Specification

A requirement specification document made by CityMob was delivered to all the participants of the meeting, see external appendix. This document was CityMob's suggestions for functions on the mobile application. Each point was discussed through, and an agreement of the basic functions was made. This document will be used as a common document for further work, so both parts know what is going to be developed.

It would be preferred if the Munichx mobile application is distributed on the munichx.de web portal. This means, it should be a sort of commercial banner on the first page, saying something about Munichx mobile is now available, free of charge. If people click on the banner they should be redirected to a Munichx mobile page, where it would be possible to easy understand the product, and also easy download the product.

Download should be possible in three ways:

- By user writing in their phone number and then receive a wap push message by SMS.
- User writing a short code via SMS e.g. CityGuide to 1880, and recive a wap push message by SMS
- User downloading the application to their computer and transfer it to their mobile by their own.

Premium-SMS and Wap push message

Downloading the application should be as easy as possible for the user. From our surveys, see section 12.3, it was shown that most young people are used to downloading java games and ringtones through SMS and wap push messages with an SMS short code, e.g. "Game3" to "1980". Hence, the preferred approach for CityMob would be to send the users an SMS with a Wap link to download the application. Billing for premium users would also be preferred by SMS, so called premium-SMS, which will cost the user some extra money to send.

The best offer that CityMob received was from Whatever Mobile. [1]

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[1]See appendix C for complete price list

Free wap push message (SMS) to users;

For SMS without any billing features behind it, there would be a set-up of Euro 149,00 and monthly fees of Euro 99,00. Prices for the single SMS would be Euro 0,060/SMS for T-Mobile and Vodafone and Euro 0,065 for eplus and o2.

Billing through premium SMS:

For Premium SMS, (with billing features), there would be a set-up fee of Euro 199,00 and monthly fees of Euro 149,00. Prices for the single SMS would be Euro 0,060/SMS for T-Mobile and Vodafone and Euro 0,065 for eplus and o2.

One important discussion here was, whether the end-users should cover the cost of getting a wap-push message through SMS, or should, the collaboration partner pay this cost. If the collaboration partners cover this cost it will be an extra cost of 0,06 Euro pro SMS send. The other solution would be that the user pays the wap-push message, the cheapest price here is 0,29 Euro C. It was agreed on that; user should pay this cost, due to difficulties in protecting the system against spam messaging, and also to avoid unnecessary cost.

Contract draft

CityMob also got a draft of a contract between the two parts. Among the details was a revenue sharing model of 45% to CityMob and 55% to Munichx of net revenue. Furthermore, Munichx will pay CityMob an initial payment of 9000Euros, see Appendix F for further details.

Realistic production schedule:
- Finished product ready for launch and delivery 22. September.

15.4   Complementing Service - Transport Information

The Munich traffic and tariff group (MVV) has the main task to ensure the public local passenger traffic (OEPNV) in Munich and environment. It coordinates the co-operation of the partners and transport enterprises taken part in the group. To the most important tasks of the MVV belong the traffic planning, the tariff management and the customer information.

The MVV is a very modern public transport company and has a well structured IT department, EVA (Die Elektrnische Fahrplanauskunft). This

department has the responsibility for the Internet, mobile phone and PDA solution for MVV. With EFA solutions it is easy to find the shortest way between points, including route planer, route table with public traffic and map.

To add to the value of the CityMob application the MVV was contacted. After a meeting in Munich 10 April 2007, which was held at MVV's head quarter, it was decided that the MyCityGuide would be a good way for MVV to promote themselves, and they decided to join the project. It was agreed that MVV would provide the application with two main functionalities, personal defined search and pre defined search.

- Personal defined search: will have an own search button in the main menu with the logo of MVV, and the user will be able to write in their own search options, see Figure 15.5. This part of the application will be accessed off-line, hence free of cost for user.

- Pre defined search: Would be if the user is checking e.g one of the restaurants and want to find out how to get their with MVV transport. Here the application will find the information automatic, hence on-line cost, since it will be a data request to the server, see Figure 15.5.

These searches would give results in form of timetable for the local train, the metro, bus and tram. It would also be a map over the transport system on the application.

15.5   Summary

The communication between the two parties has been irreproachable. It was early noticed that this was two companies that found each other on a perfect point in time. CityMob to realize their business idea and for Munichx to complete their new look and feel, hence a new web page solution and community. Since Munichx is now still under development, it is easier to implement services which compliments each other. Based on the meetings, CityMob's management team look bright on further work and the realization of MyCityGuide, especially since Munichx was willing to invest 9000 Euros in the project. A successful collaboration with the pilot customer Munichx, is considered to be a critical factor for CityMob's future.

Figure 15.5: Figure to the left shows search defined by user and figure to the right shows search pre-defined by the mobile application

Part V

Prospect and Conclusion

Items to be Resolved Before Market Launch

This chapter presents the work CityMob has to do before MyCityGuide is ready to be launched on 22 September 2007. The prototype, which is described in Chapter 14, has several shortcomings, which needs to be addressed, before it can be considered to be a finished product. These are described in Section 16.1. Furthermore, additional services, which should be considered for implementation, are presented in Section 16.2. Section 16.3 presents future company considerations.

"Final version" refers to the version which is going to be launched in Munich on the 22 September. Future version refers to any release beyond that date.

16.1 Prototype Shortcomings

The prototype was developed in order to get familiar with the technology and to get a cooperation with city magazines. During the prototyping CityMob has obtained a good understanding of how the final version should look like and which features it should include. The prototype has not been build in order to cover neither device portability nor content provider scalability. The following issues must therefore be resolved in order reach the mass market with the desired service:

- Different devices have different screen sizes and functionality

- Different devices need different image sizes

- Some phones have relatively low restrictions on the size of programs which can be installed. The final product should therefore be optimized in order to reduce its size. More careful thought on the programming code can also lead to a faster application.

- The colours, logos and images to use in the mobile application may vary from city magazine to city magazine

- Different city magazines may wish to follow different graphical user interface structures

- Different city magazines may wish to use different functionality

- Images such as advertisements may vary over time

- Lists such as lists of categories or districts may differ from city magazine to city magazine

- Text in the application may vary, such as button names, category names, etc. For instance to be able to deal with different languages

In addition to the issues related to device portability and scalability, service functions must be improved and decided upon. The most crucial are:

- **RMS.** As mentioned in Chapter 4, Record Management Store (RMS) has not been used in the prototype. Methods of accessing the RMS must be implemented in order to offer off-line functionality. RMS can also be used to store personal settings.

- **Map.** The map-solution implemented in the prototype is not satisfactory. It offers only basic functionality. CityMob should therefore make an attempt to improve the map-functionality. Which map provider that should be used in not yet decided, it will be a matter of price and quality.

- **Database** The database must be re-designed in order to include additional features. Furthermore, close thought must be given to simultaneous transactions, interrupted transactions. Redundancy on the database layer should also be implemented in order to assure availability of the service.

- **Public transport information.** Information regarding public transportation will be implemented in the version.

- **Automatic Positioning.** CityMob must decide whether to implement automatic positioning. And in that case, how it shall be implemented. The different alternatives are discussed in Chapter 6. It will be a matter of cost versus gain.

- **Devices.** Ahead of the development of the final version, CityMob must decide upon a which mobile phones to target. A J2ME application's behaviour can significantly differ on different models and brands.

- **Upgrading.** Future versions, which include improvements, enhancements or just bug fixes, are likely to be released if the first version is a success. CityMob must decide how users should update their client. There are two alternatives: Uses must either delete their old client, and afterwards install a new one. Alternatively, the existing client could be updated.

A cocept called the *CityMob Framework (CMF)* has been worked out and it will be developed by the CityMob team. This framework is described in Chapter 17. The CMF should resolve some of the problems outlined in this section.

16.2   Future Service Enhancements

This section presents the most likely future enhancements to MyCityGuide.

16.2.1   Community Features

CityMob is considering to implement community-like features on MyCityGuide. As argued in Chapter 8, such features does not increase the value of the application before a user base has been established. CityMob does therefore not prioritize them ahead of the service launch. Several community features are possible. In order to show their value, they are presented in the form of user scenarios:

- Alma wants to check the status of her friends. She starts MyCityGuide and enters the instant messaging function. In the list of all her friends she sees that Christine wants to go to the cinema later. Alma and Christine chat using the instant messaging feature and thereby plan their evening.

- Thorsten is considering hosting a poker-game with his friends on Friday evening. Before planning the evening, he needs to know if enough of his friends are interested. Thorsten posts a suggestion regarding the poker-game on a virtual-blackboard inside the MyCityGuide-community. All of his friends can see the posting and respond if they are interested. Virtual blackboard functions as a broadcast message, and Thorsten is relieved of sending a SMS message to all of his friends.

- Peter is drinking coffee in the city centre. He uses the Friend-Finder function in MyCityGuide to find out if any of his friends are close by.

The Friend-Finder maps the location of Peter's friends, and he then contacts Thomas who happens to be in the same area.

- Anna is at Schwabinger Sieben with a friend and she wants to inform her other friends about where she is. She uses the MyCityGuide mobile application, finds Schwabinger Sieben in her favourites and uses the functionality that informs the MyCityGuide server about where she is. Her friends are then informed via her profile on the MyCityGuide page, SMS, or IM.

- Florian is using the *Portable Message* and sends a message to different (groups of) friends in his surroundings. His position is matched with the data of his friends.

16.2.2   Mobile Ordering and Payment

MyCityGuide offers users information regarding, among other things, restaurants, clubs, concerts and cinemas. A natural next step is to allow users to book tables and order tickets for cinemas and concerts. Not only ordering, but also payment, is an enhancement not to long into the future. The technology is already there, only co-operation with other actors is necessary.

16.2.3   Context-Based Advertising

An important revenue source from MyCityGuide is advertising. CityMob has already planned to implement location as a context through automatic positioning methods. A natural enhancement is to bring advertisement and location context together, and offer users advertisements related to their position. This could be special offers nearby, e.g., a special dinner deal, or just a notification that a shop, which match the users preferances, is located on the other side of the street.

16.3   Company Considerations

This section seeks to highlight the administrative tasks which arise connected to MyCityGuide.

16.3.1   Legal Status

At the time this report is handed in, CityMob has the legal entity of a GBR (Gesellschaft bürgerlichen Rechts). A GBR is in Germany a combination of persons who obligate themselves mutually to contribute and carry out the work agreed on in the contract. GbR can loosely be described

as a partnership under civil law. A GbR is valid through an oral agreement, but in order to get full legal status, however, it need to be written and registered in the commercial register. This has so far not been done by CityMob.

All members of a GbR is a personally liable for everything they sign and also what is signed by other members. This is a big drawback and many companies in Germany therefore seek to become a GmbH (Gesellschaft mit beschrankter Haftung) before entering into agreements. GmbH is the most used legal entity in Germany. A GmbH is a company with limited liability, thus, members of such an entity are not personal liable for company's debts. Under German law, the GmbH must have a minimum founding capital of Euro 25,000, of which 25% but at least Euro 12,500 has to be contributed by its members. (From 2008 this amount will be adjusted to Euro 10,000).

CityMob seeks to become a limited entity before launching MyCityGuide on the market 22 September, but founding capital needs to be raised. A limited, which will be valid in Germany, can be founded easier in both Norway and England with less start-up money. However, if CityMob is awarded the Exist Seed scholarship, which is described in Section 12.4.4, only German legal entities are allowed. In that case, becoming a GmbH will be the best option. Additionally, having the status of a German entity has advantages for companies which mainly operating in the German market.

16.3.2   Required Agreements

CityMob need to establish additional agreements in order to offer map and LBS in the final version. Most important is the map feature which requires both map-provider and map-software provider. CityMob has already an overview of providers. Related to the map functionality and search functions, is automatic positioning. Position can be used as a context in searches and when using the map. It requires a collaboration with an LCS provider. CityMob has a good overview of both map and LCS providers through its market research.

Advertising revenues are will probably be an important part of CityMob's business. Advertising agencies have to be contacted in order to make money on the dedicated advertisement space in MyCityGuide. Because advertisement for mobile phone is a new area, CityMob might have to spend some time on getting profitable contracts.

16.3.3   Cost Management

During the start-up phase, CityMob has had almost none expenses. This situation is about to change. CityMob will in the future have to allow for costs associated with:

- **Legal aid.** Costs of legal assistance need to be accounted for. This could be in regard to taxes, contracts and similar.

- **Server.** MyCityGuide needs communication between client handsets and a CityMob server. CityMob therefore has to buy or rent server capacity. Additionally, server bandwidth has to be obtained. Both these cost increases in tact with the number of users.

- **Salaries.** Both CityMob's existing workers and future employees is going to want money. Even if the founders were to work for free, living costs have to be covered. To some degree, additional workforce can be obtained for free by offering company shares, or by inviting students to write Master thesis.

- **Test devices.** CityMob needs to make sure that MyCityGuide runs smoothly on all mobile phones in its target group. Mobile devices must therefore be purchased.

- **Telephone subscription.** A commercial service should have some form of customer support. This could be provided through a forum on the Internet, but a telephone service is usual. This requires costs in regard to subscription and usage.

Expenses due to extra functionality, delivering and billing of the product to end-users, will also be taken under consideration before finished product. The cost will probably be shared equally on the city magazines, the end-users and CityMob.

- **Map.** CityMob has to acquire a license in order to have a map-function in the final version. This will most likely result in a cost for each map access.

- **Automatic Positioning.** If GSM-based network positioning is implemented, charges for each location request must be covered.

- **SMS.** Cost of sending out a download link and billing the customer through premium-SMS.

CityMob Framework and Execution Plan

During this thesis a working prototype of MyCityGuide has been developed. It has, however, several shortcoming which need to be resolved before CityMob can launch it on the market. These are outlined in Chapter 16. A concept called the CityMob Framework (CMF) has been worked out in order to address some of the shortcomings. The CMF is presented in Section 17.1.

Furthermore, the scaling quality of MyCityGuide, which is covered by CMF, enables the provision of content from an unlimited number of city magazines. After MyCityGuide is successfully launched in Munich along with Munichx, CityMob will therefore seek to enter into new collaborations in order to cover more German cities. In Section 17.2, a 3 year plan, which describes the planned expansion, is given.

17.1 CityMob Framework

This section looks at the CityMob Framework (CMF). This framework is yet to be developed, but the concept has been worked out. For a more detailed description, see the complementing Master thesis [1].

In this section, the term content providers is used instead of city magazines. Even though, city magazines are the likely providers of content, the term content provider is used in order to show the generality of the CMF-concept.

CityMob have defined the architecture for a solution that provides information from several content providers and make this content available

on mobile phones. The different content providers are dealt with through the CityMob Framework, where each content provider has its own defined service. The mobile application, also called the client, is then able to access these services through the CityMob server.

17.1.1   System Overview

To get a clear understanding of the CityMob Framework - CMF and the interacting external entities, a high level system overview is given in Figure 17.1. It is important to note that the given overview only represents one content provider, but an unlimited number of other content providers will be linked to the CMF in the same manner. The figure shows the interaction and relationships between the client, one content provider, the other service providers such as map providers and subway information providers, and finally the CityMob Framework.

The positioning service

The mobile application will have several means of detecting its own location. This can for example be done through the use of a GPS. For mobile phones without this functionality, other positioning techniques may be used, as explainee in Chapter 6. Determining the device position is the task of the client, and this is thus not something that the CMF has to deal with. What the CMF may provide though, is the reference to such services.

The content provider

The content providers are sitting on the content that a user of a mobile application would want to access. This could be information of varying nature and is most certainly stored on their own servers. When a client would like to access some of this information, it would go through the CMF, and the CMF would manage the server communication with the content provider. Many content providers could be attached to the CMF. From the figure, it is shown, that the mobile application would be made available for download from the web site of the content provider, even if the actual application file would be hosted and generated by the CMF. The final aspect related to the content providers is their interaction with the CMF web interface, where they will be able to access relevant information related to the mobile application, the number of requests on their servers, and the like.

External services

There are a number of external services that the mobile application would want to use, and that are made available through the CMF. This could be
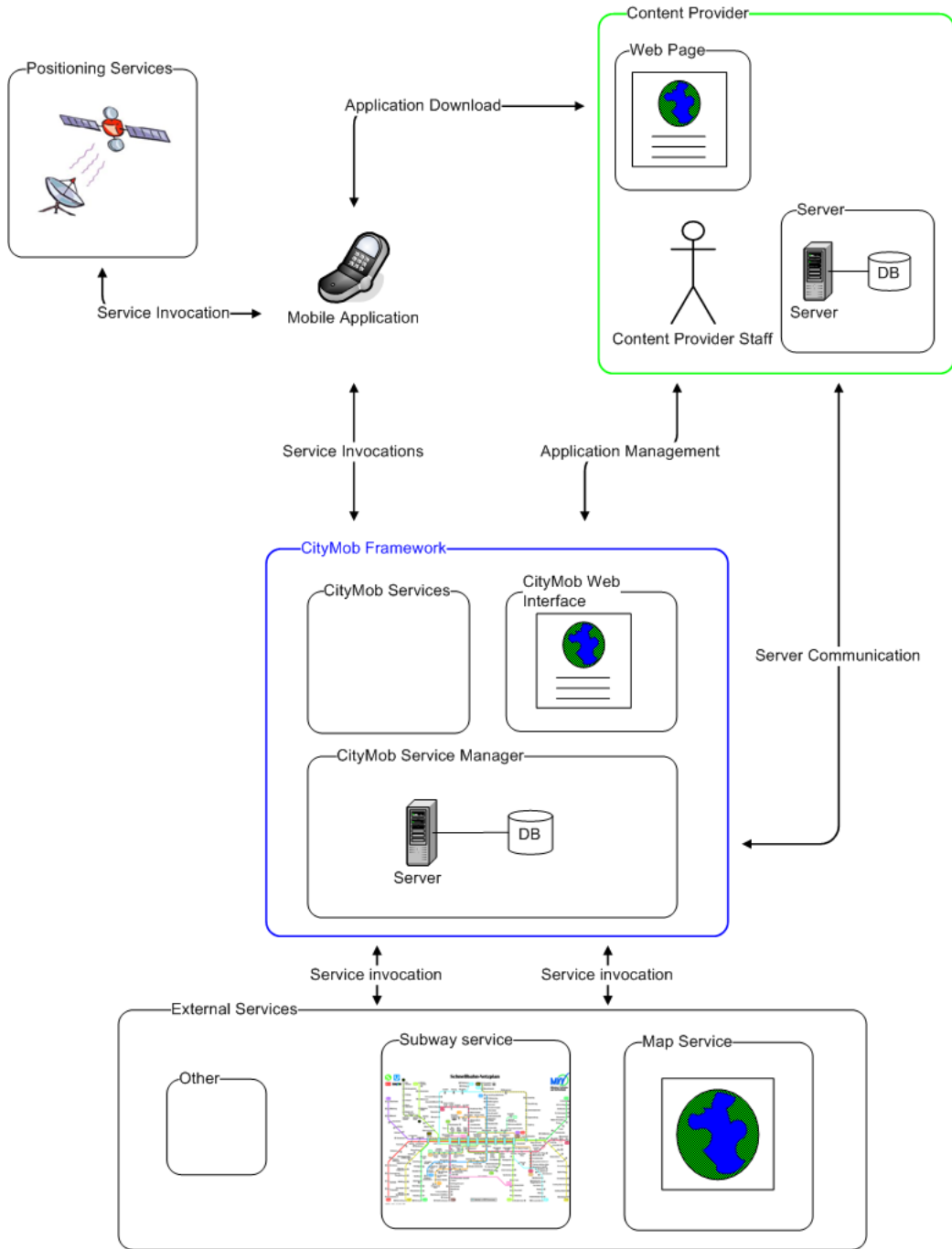
Figure 17.1: CityMob Framework and External Entities - System Overview

map services that would enable the mobile application to display a map on the mobile device. It could be subway information, or other services. These are services that would give added value to the mobile application. New external services could be added and removed.

The CityMob Framework - CMF

The CMF is the central element of the solution concept. The CMF serves as a central node that connects together the different content providers, the external services providers, and the mobile applications. By this mean, the mobile application has one interface to all kind of services and content. The content providers on the other hand are able to easily distribute their content to mobile phones, without worrying about any technical aspects related to service requests and mobile technology since the CMF provides an abstraction to these issues through its own interface. The CMF is constituted of a service manager system, a web interface, and a set of services. The service manager deals with all the behavior, logic, and data abstractions of the CMF, and constitutes the core of the CMF. The service manager also hosts a number of services. These services are somehow interfaces to external entities that need to use the CMF. For instance, whenever a mobile application sends a request to the CMF, this is done through one of these services. The server communication between the CMF and content providers is also done with the help of services hosted by the service manager. The same approach is also used for external services that the CMF may need, such as subway information.

There are a number of possibilities and solutions provided with this design:
- The mobile application only has one actor to deal with, and one interface to access, since the CMF deals with the connectivity aspects between all the actors.
- The mobile application could have access to one or many content providers, as well as one or many external services.
- An unlimited number of content providers may be added to the CMF, thus enriching the CMF with accessibility to more content.
- New services could be added to the CMF in the form of external services, and made available to the mobile application.
- The CMF is not limited to be hosting only one type of services, nor is it limited to connect to only one type of content providers. It is thus possible to imagine that different mobile applications with different purposes have access to the CMF, each accessing different services and content providers. This extends the functionality of the CMF considerably.

The above proposed solution concept to the CMF has many advantages. Making the application available for download through the web page of the content provider permits good promotion and rapid spread of the

application; the potential users of the mobile application are thus easily reachable. Every request made from the mobile application passes through the CMF and the CMF provides a common interface to all the services and all the content that a mobile application may need. The only exception for this is the location services provided to the mobile device. This configuration permits a scalable and flexible architecture where new content and service providers may be added, removed or changed. The mobile application does not have to deal with these modifications.

17.2   Realization Plan of MyCityGuide

MyCityGuide will be launched in Munich on 22.September 2007. As presented in Chapter 15, the pilot customer is Munichx. After the market launch in Munich, CityMob will spend several months on monitoring and improvement of the product.

The scalability quality of MyCityGuide allows CityMob to collaborate with several city magazines. A time schedule of 3 years duration, which shows CityMob's market expansion through new collaboration agreements with magazines in different cities, has been worket out. In order to maximize the marketing effect, large events in the respective city is selected, as for example carnival in Cologne, Bonn and Düsseldorf, the Christopher Street Day in Berlin, the Cebit in Hanover, etc.

Nr.	ⓘ	Vorgangsname	Dauer	Anfang	Ende	Vorgänger
1		Prototyp	0 Tage	Mi 20.06.07	Mi 20.06.07	
2	⊞	Pilotphase mit MunichX	63 Tage?	Mi 27.06.07	Fr 21.09.07	1
3		Unternehmensgründung	0 Tage	Fr 21.09.07	Fr 21.09.07	2
4		Produktlaunch	0 Tage	Fr 21.09.07	Fr 21.09.07	3
5	⊞	Vorbereitung Marketing/PR München	45 Tage?	Di 24.07.07	Mo 24.09.07	
6	⊞	Markteintritt München	0 Tage	Mo 24.09.07	Mo 24.09.07	5
7	⊞	Implementierungsphase München	136 Tage?	Di 25.09.07	Mo 31.03.08	6
8	⊞	Verhandlungen Köln/Düsseldorf/Bonn	10 Tage?	Sa 01.12.07	Do 13.12.07	
9	⊞	Vorbereitung Marketing/PR Köln/Düsseldorf/Bonn	30 Tage?	Mo 17.12.07	Fr 25.01.08	8
10	⊞	Technische Vorbereitung	15 Tage?	Mo 28.01.08	Fr 15.02.08	9
11	⊞	Markteintritt Köln/Düsseldorf/Bonn	0 Tage	Fr 15.02.08	Fr 15.02.08	10
12	⊞	Implementierungsphase Köln/Düsseldorf/Bonn	25 Tage?	Mo 18.02.08	Fr 21.03.08	11
13	⊞	Verhandlungen Hannover	10 Tage?	Mo 07.01.08	Fr 18.01.08	
14	⊞	Vorbereitung Marketing/PR Hannover	30 Tage?	Mo 21.01.08	Fr 29.02.08	13
15	⊞	Technische Vorbereitung Hannover	15 Tage?	Mo 03.03.08	Fr 21.03.08	14
16	⊞	Markteintritt Hannover	0 Tage	Fr 21.03.08	Fr 21.03.08	15
17	⊞	Implementierungsphase Hannover	19 Tage?	Mo 24.03.08	Mi 16.04.08	16
18	⊞	Verhandlungen Leipzig	10 Tage?	Mo 18.02.08	Fr 29.02.08	
19	⊞	Vorbereitung Marketing/PR Leipzig	30 Tage?	Mo 03.03.08	Fr 11.04.08	18
20	⊞	Technische Vorbereitung Leipzig	15 Tage?	Sa 12.04.08	Do 01.05.08	19
21	⊞	Markteintritt Leipzig	0 Tage?	Do 01.05.08	Do 01.05.08	20
22	⊞	Implementierungsphase Leipzig	21 Tage?	Fr 02.05.08	Fr 30.05.08	21

Figure 17.2: Scaling approach for CityMob, first half year of 2008

Figure 17.2 describes an approach example for the first half-year of 2008, the activity and the co-ordination of CityMob scaling approach (for complete list see Appendix D). Each market introduction takes place after a similar sample: First negotiations with the local city magazines and then the suitable partner for the MyCityGuide are decided upon. Then the preparatory phase of marketing and PR as well as the technical preparation, followed by the integration of the partners content into the MyCityGuide infrastructure. After market entrance the technical, implementation will still be monitored, in order to ensure the optimal use of the service.

For the year 2008, it's been planned to get thirteen partners, the same for 2009, and in 2010 nine new partners.

Conclusion

This thesis origins from the business idea of developing a commercial city information portal. The scope of the thesis reflect the first phase in the project and it is limited to the development of a working prototype of the system. Furthermore, research on relevant business aspects connected to a commercialisation of the service has been carried out. The findings is presented and a business plan has been formulated.

It is important to note that this project is *not* a continuation of previous work. This thesis' value results from the prototype development of a service which is going to be launched on the German marked. A final version of the service will be launched 22 September. This is the start-up date of the well know Oktoberfest in Munich. An established city magazine in Munich, namely Munichx (`www.munichx.de`), will cooperate with CityMob in regards to the launch. Munichx has also sponsored the development of the final product with Euro 9000,00. In later phases of the project, CityMob will seek to establish collaborations with several other city magazines.

The work done in the time horizon of this thesis, is in accordance to the time schedule of the project. By the very facts that a satisfactory prototype has been developed, a pilot customer collaboration with Munichx has been established, and that CityMob has obtained grants of, in all, 135 000 NOK, the outcome of this first phase has by far exceeded the expectations. Moreover, CityMob has obtained a valuable network of contact persons and a good overview of the German market. A solid foundation for a viable company has been undoubtedly been built.

The reminder of this chapter outlines how the two main objectives of this Master thesis, the CityMob business plan and the MyCityGuide prototype, have contributed to the project.

18.1   Business Plan Contributions

In order to formulate the business plan, which is presented in this thesis, several business aspects needed to be closely investigated. The findings have shed light on how CityMob should act in order to create a successful service. The different contributions are listed her:

Network Externalities. Several planned features of MyCityGuide were found to be subject to positive feedback. CityMob have planned to postpone these features until a user base has been establish.

Internal Analysis. The value configuration of CityMob pointed out primary and secondary activities. Thus, focus areas have been discovered.

External Analysis. The external analysis has located CityMob's place in the mobile business landscape. Necessary collaboration partners have been found. Furthermore, the market opportunity has been investigated along with opportunities and threats.

Market Research. Two different surveys have been carried out. Firstly, users were investigated in order to determine preferred features and target group. The feedback from the users were somehow parted. Many users were sceptic about accessing the Internet through their mobile phone, but all the less, several thought that a city guide on mobile phones were a good idea. CityMob was left with the impression that a change in users' mobile phone habits could be necessary in order for MyCityGuide to become a successful.

Secondly, all city magazines, which exist on the Internet and in magazines on the German market, were discovered. The research aimed at obtaining as much information as possible regarding these companies. This research showed that there is definitely room for MyCityGuide on the German market. None of the city magazines had a solution for mobile phones. The main challenge was considered to be the invention of a business model which would benefit both CityMob and the collaborating city magazines.

The market research identified Munichx as the favourable firm for the first partnership. This decision was based upon location, offered services, customer bases and revenues. CityMob later established a collaboration with Munichx. Moreover, possible ways of obtaining funding were also investigated.

Finally, the market research also focused on different ways of obtaining funding. Because of low initial company costs, CityMob decided to postpone the work of finding an investor. Instead CityMob applied for grants and scholarships.

CityMob's business plan is based on the findings mentioned above. It has proved to be a very valuable document. Firstly, the business plan forced CityMob to think critical through, and investigate, every aspect in connection to MyCityGuide. The document has constantly been challenged by new information, and modifications have continuously been implemented during this Master thesis. Furthermore, because the business plan contains company goals and direction, it has functioned as a rallying point and a road map for the team.

This extensive work performed on the business plan has given CityMob important insight into the complexed mobile business landscape. CityMob's main challenge, namely creating a viable business model, has apparently been accomplished. Through a revenue sharing model, CityMob has entered into a partnership with Munichx that appears to be profitable for both parties. Moreover, this revenue sharing model can be offered to a number of city magazines.

Lastly, the business plan was the CityMob's main document in order to obtain the grants from "Stipendordningen" and "Idefondet". Together, these grants amount to 135 000 NOK.

18.2   Prototype Contributions

The development of a working prototype for MyCityGuide, has brought the project several important steps forward. It has resulted in an insight in how the final product should look like and which features it should consist of. The prototype's main contributions are presented in this section.

Technology. The process of developing the prototype forced the team to get a comprehensive insight into mobile technologies. Methods, which can be used for terminal positioning, has been discovered and evaluated. In order to test the map functionality, the prototype was implemented with GPS function. Furthermore, thorough knowledge in J2ME, including its possibilities and limitations, has been obtained during the development. When the prototype was tested, the team gained experience in how J2ME programs change behaviour when they are executed on different types

mobile phones. The development framework play.Tools, which is provided to us by UnternehmerTUM, was somewhat used for the prototype. Its advantages and drawbacks have been detected.

The MyCityGuide prototype is a working system which covers more than the client side. The server side, along with communication over mobile access networks and the Internet, has also been implemented. Hence, a mobile phone, which is running the prototype, can interact with a database controlled by CityMob. Much knowledge has been gained through the implementation of this system. The technologies Hibernate, WebServices, MySQL and Apache, are now familiar to the team.

Partnership establishment. The prototype has been a very important contributor in order to obtain the collaboration agreement with Munichx. Because CityMob neither have any references nor previous work to show to, the working prototype was essential in order to convince Munichx that the team is capable of delivering a complete solution. Furthermore, it was build to suit the type of information which exist on Munichx's web-page. Through demonstrations of the prototype, CityMob accurately described how the final product was imagined to look like. Additionally, it showed Munichx the possibilities which lies within J2ME.

Funding. The prototype was demonstrated to the decision makers of the "Stipendordningen", and most likely contributed positively in order to obtaining the grant of 35 000 NOK.

Bibliography

[1] Håkon Abrahamsen and Aksel Lefebure. Development of a city mobile application. Master's thesis, NTNU, 2007.

[2] OPEN Business Club AG. Xing open bc. http://www.xing.com/. visited 23.05.2007.

[3] Aldrich and Auster. *Evan dwarfs started small: Liabilities of age and size and their strategic implications.*, volume 8. JAI Press inc., 1986.

[4] W. Brian Arthur. Positive feedbacks in the economy. *Scientific American*, 262:92–99, 1990.

[5] ProVenture AS. http://www.proventure.no/.

[6] Jan A. Audestad. Internet as a multiple graph structure: The role of the transport layer. *Inf. Secur. Tech. Rep.*, 12(1):16–23, 2007.

[7] Jan Arild Audestad. Positive feedback from the market: network externalities. This is a lecture note in the course "TTM 4165 ICT, Organisasion and Market". The note is published on URL : http://www.item.ntnu.no/fag/ttm4165/2007/networkexternalities.pdf.

[8] The Internet Assigned Number Authority. Port-number assignment. http://www.iana.org/assignments/port-numbers respectively.

[9] The Internet Assigned Number Authority. Standard protocol numbers. http://www.iana.org/assignments/protocol-numbers.

[10] Birkinshaw and J. van Basten Batenburg. Venturing to succeed. *Business Strategy Review*, 13(4):pp. 10 –17, 2002.

[11] Boostcom. Boostcom homepage. http://boostcom.no/. visited 19.05.2007.

[12] Klaus Brockhoff. *The Dynamics of Innovation : Strategic and Managerial Implications*. Springer, 1999.

[13] Giovanni Camponovo and Yves Pigneur. Business model analysis applied to mobile business. In *ICEIS (4)*, pages 173–183, 2003.

[14] Hal R. Varian Carl Shapiro. *Information Rules: A Strategic Guide to the Network Economy*. Harvard Business School Press, 1998.

[15] CeBIT. Cebit 2007. http://www.cebit.de/. visited 07.05.2007.

[16] Gløshaugen Innovation Center. http://www.ig.ntnu.no/. visited

19.05.2007.

[17] Rajesh Chandy and Gerard J. Tellis. Organizing for radical product innovation. *Journal of Marketing Research, 35 (November)*, pages 474–487, 1998.

[18] N. Chauville, D. Chatelain, and B.J. van Wyk. Wimax access over gsm/gprs in rural areas. In *Electron Devices for Microwave and Optoelectronic Applications, 2004. EDMO 2004. 12th International Symposium on*, pages 106–109, 8-9 Nov. 2004.

[19] Clayton M. Chrisensen. The innovator's dilemma. *Harper Business Essentirlas*, pages 3–39, 2003.

[20] Venture Cup. http://frontpage.venturecup.org/. visited 22.05.2007.

[21] C. Drane, M. Macnaughtan, and C. Scott. Positioning gsm telephones. *Communications Magazine, IEEE*, 36(4):46–54,59, April 1998.

[22] C.A. Berry E.B. Roberts. Entering new businesses: Selecting strategies for success. *Sloan Management Review*, 3 (Spring):3–17, 1985.

[23] Center for Digital Technology and Management. http://www.cdtm.de/. visited 07.02.2007.

[24] Leading Edge Forum. Fjeldstad and stabell define three business models for producing and delivering value to the customers. http://lef.csc.com/. visited 09.03.07.

[25] Caroll Freeman and Hannn. The liability of newness: Age dependence in organizational death rates. *American Sociological Review*, 1983.

[26] C.K. Prahalad G. Hamel, Y.L. Doz. Collaborate with your competitors - and win. *Harvard Business Review*, 1 (Jan/Feb):133–139, 1989.

[27] M. St. Johns G. Huston. Considerations on the use of a service identifier in packet headers. Internet Architecture Board, Request for Comments: 3639, October 2003.

[28] J. Gans and S. Stern. When does start-up innovation spur the gale of creative destruction? *RAND Journal of Economics*, 33:571–586, Winter 2002.

[29] Soma2 GmbH. B2b page. http://www.webcombi.de/. visited 01.03.2007.

[30] The GSM Association (GSMA). Homepage. www.gmsworld.com.

[31] Geoff Huston. Should the network know what we're up to? *The ISP Column*, March 2003.

[32] Næringslivets idéfond for NTNU. http://www.ntnu.no/ide. visited 22.05.2007.

[33] David S. Isenberg. The dawn of the stupid network. *ACM Networker*, 2.1:24–31., 1998.

[34] European IST. Fp6 project spice. http://www.ist-spice.org/. visited 19.05.2007.

[35] K. Pavitt J. Tidd, J. Bessant. *Learning through alliances, in: Managing Innovation*. Wiley, 2nd edition edition, 2001.

[36] Club Java. Clubs java's homepage. http://www.club-java.com/TastePhone/J2ME/.

[37] Rod Johnson. *Expert One-On-One J2EE Design and Development*. Hungry Minds Inc.|, 2003.

[38] Eija Kaasinen. *User acceptance of mobile services -value, ease of use, trust and ease of adoption.* PhD thesis, Tampere University of Technology, 2005.

[39] Krüger and Herklotz. http://www.kh-partners.de. visited 19.05.2007.

[40] Ventrue Lab. http://www.myventurelab.com/Default.asp.

[41] Jack McCarthy. China bans skype. InfoWorld.

[42] Mecomo. Mecomo homepage. www.mecomo.com.

[43] Christian Hillebrand Michael Koch, Georg Groh and Natalie Fremuth. Mobile support for lifestyle communities. *Bericht Nr. 2 aus dem Forschungsprojekt COSMOS (Community Online Services and Mobile Solutions, FKZ 01 HW 0107 - 0110)*, 2002.

[44] SUN Microsystems. Databases and midp, part 1: Understanding the record management system.

[45] SUN Microsystems. J2me building blocks for mobile devices - white paper on kvm and the connected limited device configuration (cldc).

[46] Global mobile Suppliers Association (GSA). Gsa homepage. www.gsacom.com. visited 14.02.2007.

[47] Munichx. Munichx mediadaten. *Mediadaten*, 2006.

[48] IP Network. *Television 2005 - International Key Facts.* IP Network, 2006.

[49] Antonio Nucci. The future of traffic detection and classification. *PipelinePub.com*, 3, September 2006.

[50] Leiv Eriksson Nyskapning. http://www.len.no/. visited 22.05.2007.

[51] Business Intelligence Partner. http://www.bipartner.no/. visited 19.05.2007.

[52] Michael Porter. *Competitive Advantage: Creating Sustaining Superior Business Performance.* The Free Press, 1985.

[53] Hamel & Prahalad. Strategic intent. *HBR*, 67:3 (May-June):63–76, 1989.

[54] K.W. Richardson. Umts overview. In *Electronics & Communication Engineering Journal*, volume 12, pages 93–100, June 2000.

[55] H Schrader, S./Sattler. Zwischenbetriebliche kooperation: Informaler informationsaustausch in den usa und deutschland. *DBW*, 53:589 – 608, 1993.

[56] Sun Developer Network (SDN). Java me connected limited device configuration (cldc). http://java.sun.com/products/cldc/.

[57] Skype. www.skype.com.

[58] Charles B. Stabell and Øystein D. Fjeldstad. Configuring value for competitive advantage: On chains, shops, and networks. *Strategic Management Journal*, Vol 19:413–437, 1998.

[59] Sun. Midp 2.0 api.

[60] Inc Sun Microsystems. J2me building blocks for mobile devices; white paper on kvm and the connected, limited device configuration (cldc). http://java.sun.com/products/cldc/wp/KVMwp.pdf. visited: 15.02.2007.

[61] D. J. Teece. Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy*,

15:285–305, 1986.

[62] Kim Topley. *J2ME in a Nutshell*. O'Reilly Media, Inc., 2002.

[63] Trådløse Trondheim. Trådløse trondheim home. http://www.tradlosetrondheim.no/index.php?la=no. visited 19.05.2007.

[64] International Telecommunication Union. Itu homepage. http://www.itu.int/home/index.html. visited 07.02.2007.

[65] UnternehmerTUM. visited 19.05.2007.

[66] Viking Venture. http://www.vikingventure.com/. visited 22.05.2007.

[67] Phil Wolff. Uae blocks skype.com. Skype Journal, April 2005.

[68] C.L.C. Wong, M.C. Lee, and R.K.W. Chan. Gsm-based mobile positioning using wap. In *Wireless Communications and Networking Conference, 2000. WCNC. 2000 IEEE*, volume 2, pages 874–878vol.2, 23-28 Sept. 2000.

[69] GSM World. Gsm world homepage. www.gsmworld.com/technology.

[70] Java World. Midp user interface. http://www.javaworld.com/.

APPENDIX A

Prototype - Class Diagrams

In this appendix, it wil be shown the entire class diagram for the server remote classes and the *MyCityGuideService*. Remote classes are objects that are defined and implemented on the server, and that can be accessed and used by the client through the *MyCityGuideService* defined on the client side.

Class Diagram - MyCityGuideService

Figure A.1 shows the class diagram for the *MyCityGuideService*.

Class Diagram - Remote Classes

Figure A shows the class diagram for the remote classes.
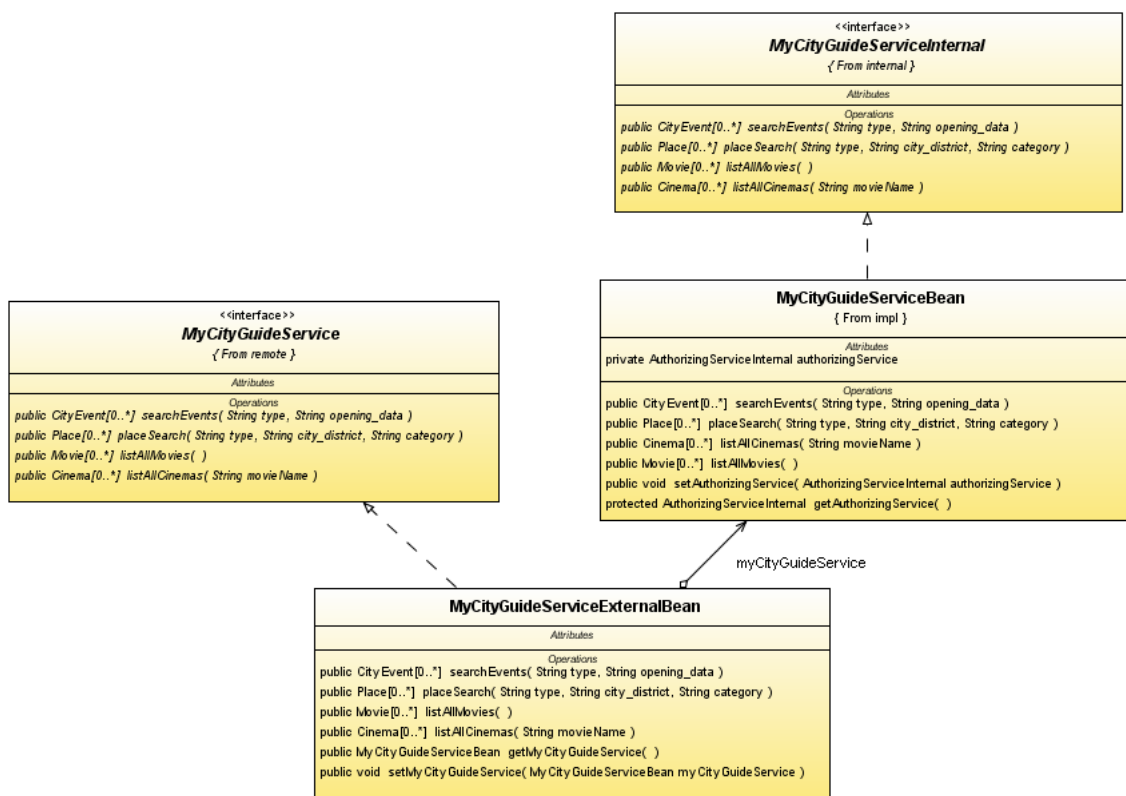
Figure A.1: Class diagram - MyCityGuideService
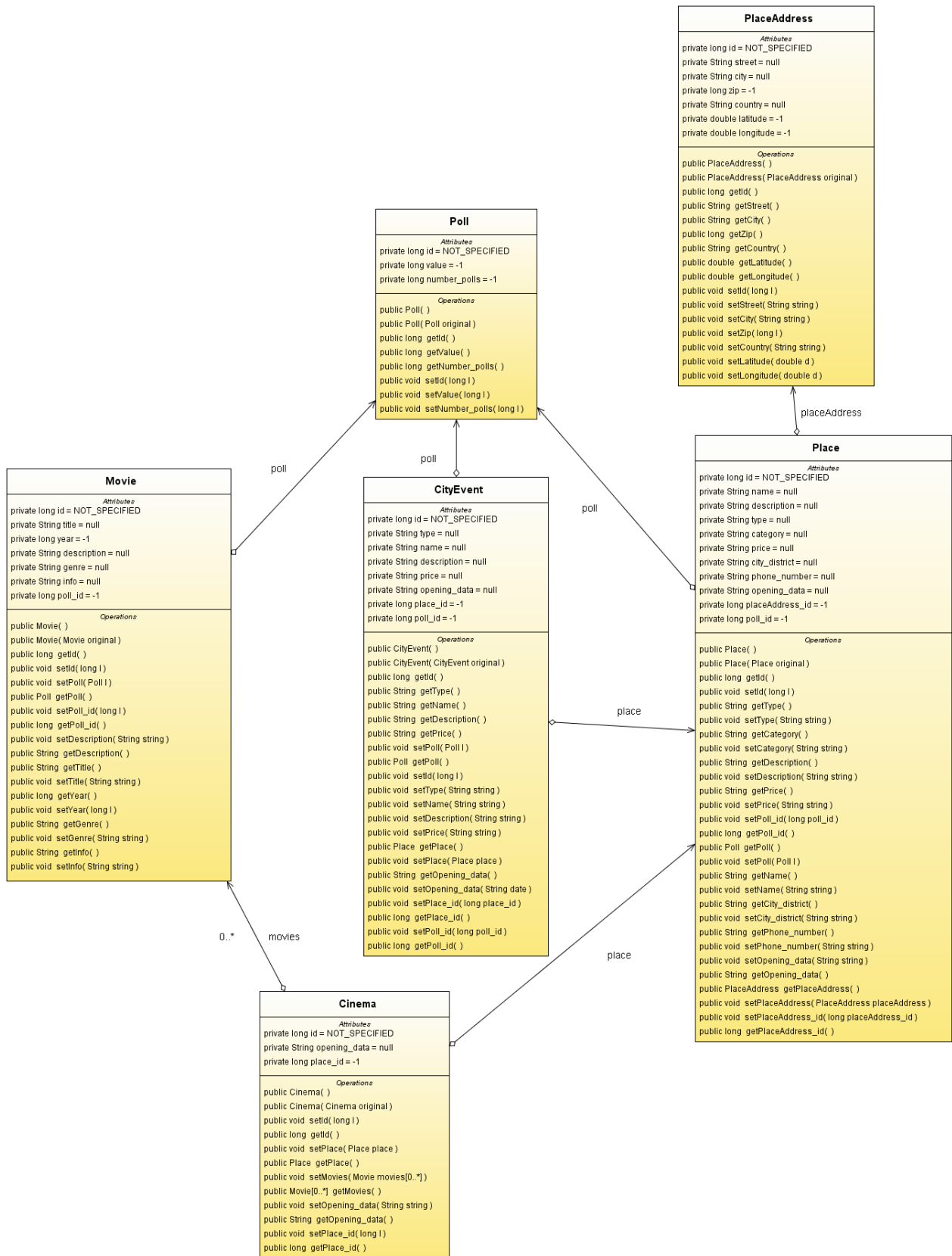
Figure A.2: Class diagram - Remote classes

The Client - Class Diagram

Figure B.1 shows the class diagram of the client side of the CMF. The figure shows the clients' classes and the main methods and attributes.
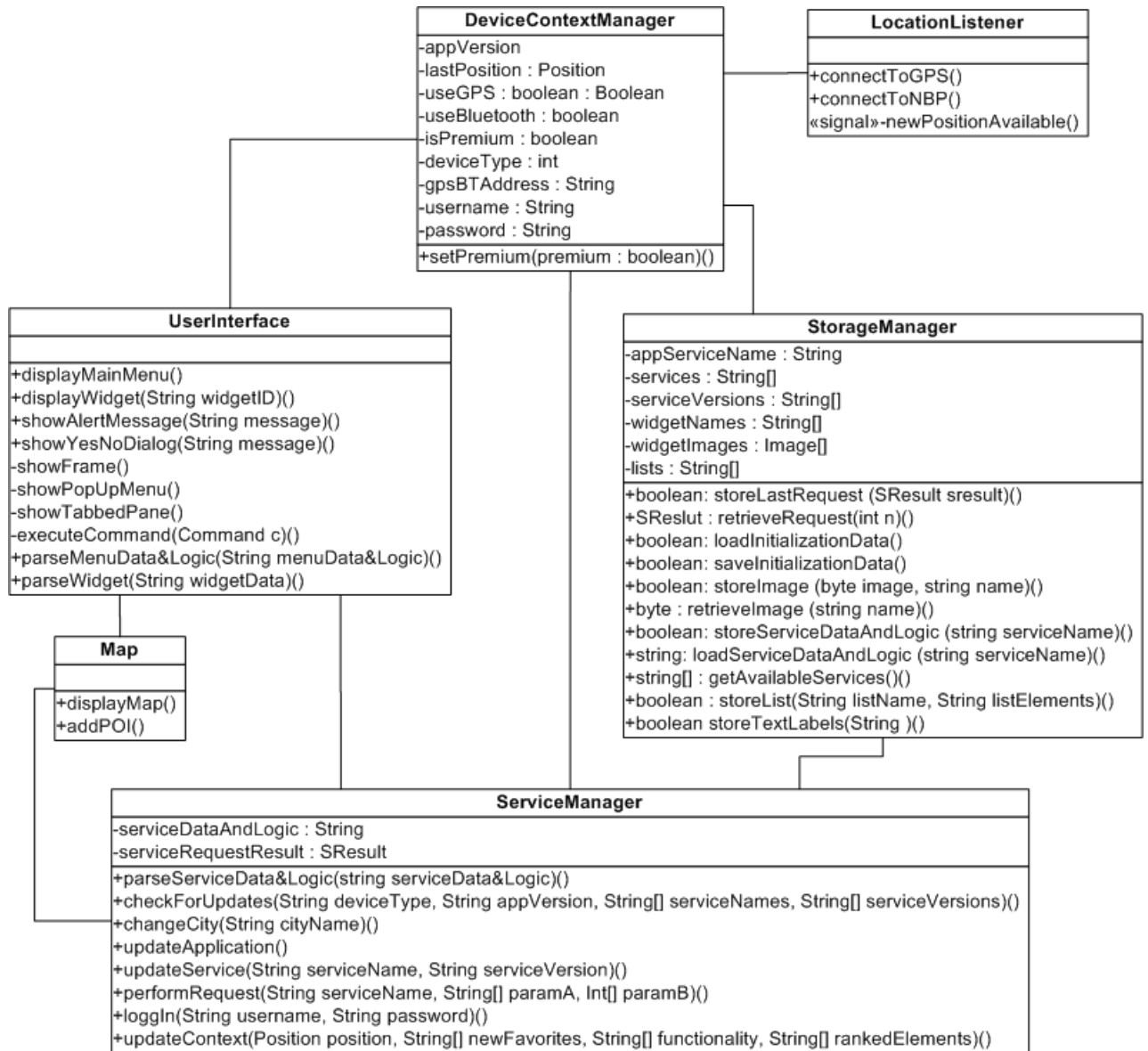
Figure B.1: Class Diagram - Client

APPENDIX C

Proposal SMS Payment

In this appendix, it will be shown the best price offer CityMob received on premium-SMS and the revenue sharing model with the 3rd part provider.

WHATEVER *MOBILE*

Order Form SMS Payment / Germany

Contractual partner

Company:	CityMob, Petter Johannessen	Address:	Lichtenbergstr. 8
Postcode / town:	D 85748 Garching	Country:	_____
Tax number:	_____	VAT-ID number:	_____

Single Payment using SMS Shortcode (Shared)

Shortcodes available:
(Please mark your choice)

	82200	78000	53000	41000	84000	48000	86000
SMS	☐	☐	☐	☐	☐	☐	☐
SMS – Tariff (gross)	€ 0,29	€ 1,99	€ 2,99	€ 4,99	€ 0,49	€ 0,00 – € 4,99	€ 0,00 – € 4,99

Please observe! No erotic services allowed on shortcode 48000 (SMS & MMS)

Payouts: 100%   refererring to shortcodes 41000, 53000, 78000, 82200

Consumer's Price (gross)	T-Mobile	Vodafone	Eplus	O2	Debitel	mobilcom	Talkline	Phone House	Victorvox
0,290 €	€ 0,172	€ 0,105	€ 0,102	€ 0,111	€ 0,084	€ 0,099	€ 0,107	€ 0,100	€ 0,085
1,990 €	€ 1,178	€ 1,153	€ 1,137	€ 1,127	€ 1,143	€ 1,147	€ 1,134	€ 1,140	€ 1,073
2,990 €	€ 1,770	€ 1,770	€ 1,759	€ 1,724	€ 1,810	€ 1,778	€ 1,765	€ 1,750	€ 1,656
4,990 €	€ 2,954	€ 3,004	€ 3,019	€ 2,931	€ 3,048	€ 2,997	€ 3,025	€ 2,950	€ 2,818

Mobile Service Provider Phone House announced Changes in relation with the increasement of the VAT in Germany by February 1ˢᵗ 2007.

Payouts: 100%   refererring to shortcodes 48000, 86000

Consumer's Price (gross)	T-Mobile	Vodafone	Eplus	O2	debitel	Mobilcom* Talkline* Phone House* Victorvox*
0,290 €	0,172 €	0,179 €	0,132 €	0,164 €	0,188 €	0,179 €
0,490 €	0,290 €	0,302 €	0,248 €	0,278 €	0,317 €	0,302 €
0,990 €	0,586 €	0,611 €	0,550 €	0,603 €	0,641 €	0,611 €
1,490 €	0,882 €	0,919 €	0,827 €	0,939 €	0,964 €	0,919 €
1,990 €	1,178 €	1,228 €	1,185 €	1,254 €	1,288 €	1,228 €
2,490 €	1,474 €	1,536 €	1,507 €	1,622 €	1,611 €	1,536 €
2,990 €	1,770 €	1,844 €	1,810 €	1,947 €	1,935 €	1,844 €
3,490 €	2,066 €	2,153 €	2,113 €	2,273 €	2,258 €	2,153 €
3,990 €	2,362 €	2,461 €	2,415 €	2,599 €	2,582 €	2,461 €
4,990 €	2,954 €	3,078 €	3,120 €	3,250 €	3,229 €	3,078 €

Further Tariffs upon Request – Billing by the Cent possible over all networks!

Should the total amount of the revenue share not reach €100 plus VAT in a billing month, the entitlement for payment for this month forfeits and there will be no payment from WHATEVER MOBILE.

* Billing for these Mobile Service Providers is accomplished through the Billing Interface of the respective Network Operator (pls. see Description of Services Mobile Payment). Listed Payouts apply to MSPs' End Customers on the Vodafone Infrastructure.

Payouts: **100%**   referring to Shortcode 84000 (SMS-Votings, Sweepstakes)

Consumer's Price (gross)	T-Mobile	Vodafone	Eplus	O2	Debitel	mobilcom	Talkline	Phone House	Victorvox
0,490 €	€ 0,220	€ 0,228	€ 0,222	€ 0,202	€ 0,217	€ 0,225	€ 0,189	€ 0,220	€ 0,201

Mobile Service Provider Phone House announced Changes in relation with the increasement of the VAT in Germany by February 1st 2007.

Should the total amount of the revenue share not reach €100 plus VAT in a billing month, the entitlement for payment for this month forfeits and there will be no payment from WHATEVER MOBILE.

Costs:

Setup	€ 199,00 / Shortcode

Monthlies	Basic fee	Service fee*
	€ 149,00 / Shortcode	6 %

* Percent of monthly gross turnover with end customers

Service Messages:*

€ 0,070 per SMS for Service Messages*

SMS-Fees:

T-Mobile, Vodafone	€ 0,060/SMS
E-Plus[1], O	€ 0,065/SMS
Invalid Address	€ 0,095/SMS

* If needed for Handshakes, Statusmessages, etc.

1. Keyword included in setup

Each further keyword
Setup: € 25,00
Monthly: € 25,00

Tolerant Keyword Routing

Setup   € 99,00
Monthly: € 49,00

Connection to WHATEVER MOBILE

Product	Protocol		
SMS Single Payment	☐ HTTP ☐ WMPay (HTTPs)*	☐ UCP ☐ SMTP	☐ SMPP
MMS Single Payment	☐ HTTP / MM7	☐ SMTP	
SMS Subscription Payment, Web Payment	☐ WMPay (HTTPs)		

IP Address/es: ___.___.___.___   Subnetmask: ___.___.___.___

URL: http:// _____
     (Only needed for Connections via HTTP)

* Only for SMS Payment via non-Premium Shortcodes (48000, 86000), incl. Delivery of Content through WMPay-Interface.

Access to „Client Control Center" (Administration- und Statisticstool)

Pre- and Surname: _____   Email-Address: _____

Pre- and Surname: _____   Email-Address: _____

Further Terms

The contracts commences when WHATEVER MOBILE activates the account.

Designated activation date as requested by the client: _____

All prices plus VAT, unless stated otherwise.

☒ We have read and accepted the enclosed terms & conditions V_.__, the scope of services Mobile Payment _.__ and the National Regulations V_.__.
☒ Hereby we order the services marked above.

_____, _____

Hamburg, _____

_____
Contractual partner

_____
WHATEVER MOBILE GmbH
Stormsweg 5a, D-22085 Hamburg

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Project Plan CityMob

In this appendix, it will be shown the expansion approach for CityMob and how its plan to expend further in Germany over the next three years based on the details given in section 17.2. Since all the members are, beside of English and Norwegian, also German speaking, and the version of Microsoft Office Project which we used was in German, is this plan unfortunately also in German.

Nr.	Vorgangsname	Dauer	Anfang	Ende	Vorgänger
1	Prototyp	0 Tage	Mi 20.06.07	Mi 20.06.07	
2	Pilotphase mit Munich X	63 Tage?	Mi 27.06.07	Mi 21.09.07	1
3	Unternehmensgründung	0 Tage	Mi 21.09.07	Fr 21.09.07	2
4	Produktraum	0 Tage	Fr 21.09.07	Fr 21.09.07	3
5	Vorbereitung Marketing PR München	45 Tage?	Di 24.07.07	Mo 24.09.07	3
6	Markteintritt München	0 Tage?	Mo 24.09.07	Mo 24.09.07	5
7	Implementierungsphase München	136 Tage?	Di 25.09.07	Mo 31.03.08	6
8	Verhandlungen Köln/Düsseldorf Bonn	10 Tage?	Di 25.09.07	Do 13.12.07	6
9	Vorbereitung Marketing PR Köln/Düsseldorf Bonn	30 Tage?	Sa 01.12.07	Fr 25.01.08	8
10	Technische Vorbereitung	15 Tage?	Mo 17.12.07	Fr 15.02.08	9
11	Markteintritt Köln/Düsseldorf Bonn	0 Tage	Mo 28.01.08	Fr 15.02.08	
12	Implementierungsphase Köln/Düsseldorf Bonn	25 Tage?	Mo 18.02.08	Fr 21.03.08	11
13	Verhandlungen Hannover	10 Tage?	Mo 07.01.08	Fr 18.01.08	12
14	Vorbereitung Marketing PR Hannover	30 Tage?	Mo 21.01.08	Fr 29.02.08	13
15	Technische Vorbereitung Hannover	15 Tage?	Mo 03.03.08	Fr 21.03.08	14
16	Markteintritt Hannover	0 Tage	Fr 21.03.08	Fr 21.03.08	15
17	Implementierungsphase Hannover	19 Tage?	Mo 24.03.08	Mi 16.04.08	16
18	Verhandlungen Leipzig	10 Tage?	Mo 18.02.08	Fr 29.02.08	
19	Vorbereitung Marketing PR Leipzig	30 Tage?	Mo 03.03.08	Fr 11.04.08	18
20	Technische Vorbereitung Leipzig	15 Tage?	Sa 12.04.08	Fr 01.05.08	19
21	Markteintritt Leipzig	0 Tage?	Mo 01.05.08	Do 01.05.08	20
22	Implementierungsphase Leipzig	21 Tage?	Fr 02.05.08	Fr 30.05.08	21
23	Verhandlungen Berlin	14 Tage?	Mo 05.05.08	Do 22.05.08	
24	Vorbereitung Marketing PR Berlin	30 Tage?	Fr 23.05.08	Mi 02.07.08	23
25	Technische Vorbereitung Berlin	15 Tage?	Do 03.07.08	Mi 23.07.08	24
26	Markteintritt Berlin	0 Tage?	Mi 23.07.08	Mi 23.07.08	25
27	Implementierungsphase Berlin	21 Tage?	Do 24.07.08	Do 21.08.08	26
28	Verhandlungen Stuttgart	14 Tage?	Mo 05.05.08	Do 22.05.08	
29	Vorbereitung Marketing PR Stuttgart	30 Tage?	Fr 23.05.08	Mi 02.07.08	28
30	Technische Vorbereitung Stuttgart	15 Tage?	Do 03.07.08	Mi 23.07.08	29
31	Markteintritt Stuttgart	0 Tage?	Mi 23.07.08	Mi 23.07.08	30
32	Implementierungsphase Stuttgart	19 Tage?	Do 24.07.08	Di 19.08.08	31
33	Verhandlungen Frankfurt a.M.	14 Tage	Mo 28.04.08	Fr 16.05.08	
34	Vorbereitung Marketing PR Frankfurt a.M.	42 Tage	Fr 16.05.08	Mo 14.07.08	33
35	Technische Vorbereitung Frankfurt a.M.	14 Tage	Mo 14.07.08	Fr 01.08.08	34
36	Markteintritt Frankfurt a.M.	0 Tage	Fr 01.08.08	Fr 01.08.08	35
37	Implementierungsphase Frankfurt a.M.	21 Tage	Fr 01.08.08	Fr 29.08.08	36

Vorgang	Meilenstein	Externe Vorgänge	
Unterbrechung	Sammelvorgang	Externer Meilenstein	
In Arbeit	Projektsammelvorgang	Stichtag	

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Nr.	●	Vorgangsname	Dauer	Anfang	Ende	Vorgänger
38	⊞	Verhandlungen Hamburg	14 Tage	Mo 05.05.08	Fr 23.05.08	
39	⊞	Vorbereitung Marketing/PR Hamburg	42 Tage	Fr 23.05.08	Mo 21.07.08	38
40	⊞	Technische Vorbereitung Hamburg	14 Tage	Mo 21.07.08	Fr 08.08.08	39
41	⊞	Markteintritt Hamburg	0 Tage	Fr 08.08.08	Fr 08.08.08	40
42	⊞	Implementierungsphase Hamburg	21 Tage	Fr 08.08.08	Fr 05.09.08	41
43	⊞	Verhandlungen Dortmund	14 Tage	Mo 12.05.08	Fr 30.05.08	
44	⊞	Vorbereitung Marketing/PR Dortmund	42 Tage	Fr 30.05.08	Mo 28.07.08	43
45	⊞	Technische Vorbereitung Dortmund	14 Tage	Mo 28.07.08	Fr 15.08.08	44
46	⊞	Markteintritt Dortmund	0 Tage	Fr 15.08.08	Fr 15.08.08	45
47	⊞	Implementierungsphase Dortmund	21 Tage	Fr 15.08.08	Fr 12.09.08	46
48	⊞	Verhandlungen München 2	14 Tage	Fr 27.05.08	Mo 16.06.08	
49	⊞	Vorbereitung Marketing/PR München 2	42 Tage	Mo 16.06.08	Di 12.08.08	48
50	⊞	Technische Vorbereitung München 2	14 Tage	Di 12.08.08	Mo 01.09.08	49
51	⊞	Markteintritt München 2	0 Tage	Mo 01.09.08	Mo 01.09.08	50
52	⊞	Implementierungsphase München 2	21 Tage	Mo 01.09.08	Mo 29.09.08	51
53	⊞	Verhandlungen Bremen	14 Tage	Do 26.06.08	Di 15.07.08	
54	⊞	Vorbereitung Marketing/PR Bremen	42 Tage	Di 15.07.08	Do 11.09.08	53
55	⊞	Technische Vorbereitung Bremen	14 Tage	Do 11.09.08	Mi 01.10.08	54
56	⊞	Markteintritt Bremen	0 Tage	Mi 01.10.08	Mi 01.10.08	55
57	⊞	Implementierungsphase Bremen	21 Tage	Mi 01.10.08	Mi 29.10.08	56
58	⊞	Verhandlungen Essen	14 Tage	Mo 25.08.08	Fr 12.09.08	
59	⊞	Vorbereitung Marketing/PR Essen	42 Tage	Fr 12.09.08	Di 11.11.08	58
60	⊞	Technische Vorbereitung Essen	14 Tage	Di 11.11.08	Mo 01.12.08	59
61	⊞	Markteintritt Essen	0 Tage	Mo 01.12.08	Mo 01.12.08	60
62	⊞	Implementierungsphase Essen	21 Tage	Mo 01.12.08	Mo 29.12.08	61
63	⊞	Verhandlungen Nürnberg	14 Tage	Mi 24.12.08	Di 13.01.09	
64	⊞	Vorbereitung Marketing/PR Nürnberg	42 Tage	Di 13.01.09	Do 12.03.09	63
65	⊞	Technische Vorbereitung Nürnberg	14 Tage	Do 12.03.09	Mi 01.04.09	64
66	⊞	Markteintritt Nürnberg	0 Tage	Mi 01.04.09	Mi 01.04.09	65
67	⊞	Implementierungsphase Nürnberg	21 Tage	Mi 01.04.09	Mi 29.04.09	66
68	⊞	Verhandlungen Dresden	14 Tage	Do 25.12.08	Mi 14.01.09	
69	⊞	Vorbereitung Marketing/PR Dresden	42 Tage	Mi 14.01.09	Do 12.03.09	68
70	⊞	Technische Vorbereitung Dresden	14 Tage	Do 12.03.09	Mi 01.04.09	69
71	⊞	Markteintritt Dresden	0 Tage	Mi 01.04.09	Mi 01.04.09	70
72	⊞	Implementierungsphase Dresden	21 Tage	Mi 01.04.09	Mi 29.04.09	71
73	⊞	Verhandlungen Berlin 2	14 Tage	Di 27.01.09	Fr 13.02.09	
74	⊞	Vorbereitung Marketing/PR Berlin 2	42 Tage	Fr 13.02.09	Di 14.04.09	73

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Unterbrechung   Sammelvorgang   Externer Meilenstein ●
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Mai   Jul   Sep   Nov   2008 Jan   Mrz
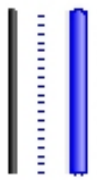
Nr.	Vorgangsname	Dauer	Anfang	Ende	Vorgänger
75	Technische Vorbereitung Berlin 2	14 Tage	Di 14.04.09	Mo 04.05.09	74
76	Markteintritt Berlin 2	0 Tage	Mo 04.05.09	Mo 04.05.09	75
77	Implementierungsphase Berlin 2	21 Tage	Mo 04.05.09	Mo 01.06.09	76
78	Verhandlungen Bochum	14 Tage	Di 24.02.09	Fr 13.03.09	
79	Vorbereitung Marketing PR Bochum	42 Tage	Mo 16.03.09	Di 12.05.09	78
80	Technische Vorbereitung Bochum	14 Tage	Mo 13.05.09	Mo 01.06.09	79
81	Markteintritt Bochum	0 Tage	Mo 01.06.09	Mo 01.06.09	80
82	Implementierungsphase Bochum	21 Tage	Di 02.06.09	Di 30.06.09	81
83	Verhandlungen Dortmund 2	14 Tage	Mi 25.03.09	Di 14.04.09	
84	Vorbereitung Marketing PR Dortmund 2	42 Tage	Di 14.04.09	Do 11.06.09	83
85	Technische Vorbereitung Dortmund 2	14 Tage	Do 11.06.09	Mi 01.07.09	84
86	Markteintritt Dortmund 2	0 Tage	Mi 01.07.09	Mi 01.07.09	85
87	Implementierungsphase Dortmund 2	21 Tage	Mi 01.07.09	Mi 29.07.09	86
88	Verhandlungen Hannover 2	14 Tage	Mi 01.04.09	Di 21.04.09	
89	Vorbereitung Marketing PR Hannover 2	42 Tage	Di 21.04.09	Do 18.06.09	88
90	Technische Vorbereitung Hannover 2	14 Tage	Do 18.06.09	Mi 08.07.09	89
91	Markteintritt Hannover 2	0 Tage	Mi 08.07.09	Mi 08.07.09	90
92	Implementierungsphase Hannover 2	21 Tage	Mi 08.07.09	Mi 05.08.09	91
93	Verhandlungen Köln 2	14 Tage	Mo 27.04.09	Fr 15.05.09	
94	Vorbereitung Marketing PR Köln 2	42 Tage	Fr 15.05.09	Di 14.07.09	93
95	Technische Vorbereitung Köln 2	14 Tage	Di 14.07.09	Mo 03.08.09	94
96	Markteintritt Köln 2	0 Tage	Mo 03.08.09	Mo 03.08.09	95
97	Implementierungsphase Köln 2	21 Tage	Mo 03.08.09	Mo 03.08.09	96
98	Verhandlungen Duisburg	14 Tage	Di 14.07.09	Mo 03.08.09	
99	Vorbereitung Marketing PR Duisburg	42 Tage	Mo 03.08.09	Mo 28.09.09	98
100	Technische Vorbereitung Duisburg	14 Tage	Mo 28.09.09	Di 14.07.09	99
101	Markteintritt Duisburg	0 Tage	Mo 03.08.09	Mo 03.08.09	100
102	Implementierungsphase Duisburg	21 Tage	Mo 03.08.09	Mo 03.08.09	101
103	Verhandlungen Stuttgart 2	14 Tage	Di 14.07.09	Do 16.07.09	
104	Vorbereitung Marketing PR Stuttgart 2	42 Tage	Do 16.07.09	Fr 11.09.09	103
105	Technische Vorbereitung Stuttgart 2	14 Tage	Fr 28.08.09	Do 01.10.09	104
106	Markteintritt Stuttgart 2	0 Tage	Mo 03.08.09	Do 01.10.09	105
107	Implementierungsphase Stuttgart 2	21 Tage	Mo 03.08.09	Mi 28.10.09	106
108	Verhandlungen Hamburg 2	14 Tage	Di 14.07.09	Fr 28.08.09	
109	Vorbereitung Marketing PR Hamburg 2	42 Tage	Fr 11.09.09	Di 29.09.09	108
110	Technische Vorbereitung Hamburg 2	14 Tage	Di 29.09.09	Sa 17.10.09	109
111	Markteintritt Hamburg 2	0 Tage	Sa 17.10.09	Sa 17.10.09	110

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Nr.	Vorgangsname	Dauer	Anfang	Ende	Vorgänger
112	Implementierungsphase Hamburg 2	21 Tage	Sa 17.10.09	Do 12.11.09	111
113	Verhandlungen Frankfurt a.M. 2	14 Tage	Di 14.07.09	Mo 03.08.09	
114	Vorbereitung Marketing/PR Frankfurt a.M. 2	42 Tage	Mo 03.08.09	Di 29.09.09	113
115	Technische Vorbereitung Frankfurt a.M. 2	14 Tage	Di 29.09.09	Sa 17.10.09	114
116	Markteintritt Frankfurt a.M. 2	0 Tage	Sa 17.10.09	Sa 17.10.09	115
117	Implementierungsphase Frankfurt a.M. 2	21 Tage	Sa 17.10.09	Do 12.11.09	116
118	Verhandlungen Essen 2	14 Tage	Mi 29.07.09	Mo 17.08.09	
119	Vorbereitung Marketing/PR Essen 2	42 Tage	Mo 17.08.09	Mi 14.10.09	118
120	Technische Vorbereitung Essen 2	14 Tage	Mi 14.10.09	So 01.11.09	119
121	Markteintritt Essen 2	0 Tage	So 01.11.09	So 01.11.09	120
122	Implementierungsphase Essen 2	21 Tage	So 01.11.09	Fr 27.11.09	121
123	Verhandlungen Düsseldorf 2	14 Tage	Do 27.08.09	Mi 16.09.09	
124	Vorbereitung Marketing/PR Düsseldorf 2	42 Tage	Mi 16.09.09	Mi 11.11.09	123
125	Technische Vorbereitung Düsseldorf 2	14 Tage	Mi 11.11.09	Di 01.12.09	124
126	Markteintritt Düsseldorf 2	0 Tage	Di 01.12.09	Di 01.12.09	125
127	Implementierungsphase Düsseldorf 2	21 Tage	Di 01.12.09	Di 29.12.09	126
128	Verhandlungen Düsseldorf 2	14 Tage	Do 27.08.09	Mi 16.09.09	
129	Vorbereitung Marketing/PR Düsseldorf 2	42 Tage	Mi 16.09.09	Mi 11.11.09	128
130	Technische Vorbereitung Düsseldorf 2	14 Tage	Mi 11.11.09	Di 01.12.09	129
131	Markteintritt Düsseldorf 2	0 Tage	Di 01.12.09	Di 01.12.09	130
132	Implementierungsphase Düsseldorf 2	21 Tage	Di 01.12.09	Di 29.12.09	131
133	Verhandlungen Bielefeld 2	14 Tage	Di 27.10.09	Di 13.11.09	
134	Vorbereitung Marketing/PR Bielefeld 2	42 Tage	Di 13.11.09	Di 12.01.10	133
135	Technische Vorbereitung Bielefeld 2	14 Tage	Di 12.01.10	Mo 01.02.10	134
136	Markteintritt Bielefeld 2	0 Tage	Di 01.02.10	Mo 01.02.10	135
137	Implementierungsphase Bielefeld 2	21 Tage	Mo 01.02.10	Mo 01.03.10	136
138	Verhandlungen Wuppertal 2	14 Tage	Mo 23.11.09	Fr 11.12.09	
139	Vorbereitung Marketing/PR Wuppertal 2	42 Tage	Fr 11.12.09	Di 09.02.10	138
140	Technische Vorbereitung Wuppertal 2	14 Tage	Di 09.02.10	Mo 01.03.10	139
141	Markteintritt Wuppertal 2	0 Tage	Mo 01.03.10	Mo 01.03.10	140
142	Implementierungsphase Wuppertal 2	21 Tage	Mo 01.03.10	Mo 29.03.10	141
143	Verhandlungen Mannheim 2	14 Tage	Do 24.12.09	Mi 13.01.10	
144	Vorbereitung Marketing/PR Mannheim 2	42 Tage	Fr 12.03.10	Fr 12.03.10	143
145	Technische Vorbereitung Mannheim 2	14 Tage	Do 01.04.10	Do 01.04.10	144
146	Markteintritt Mannheim 2	0 Tage	Do 01.04.10	Do 01.04.10	145
147	Implementierungsphase Mannheim 2	21 Tage	Do 01.04.10	Do 29.04.10	146
148	Verhandlungen Bremen 2	14 Tage	Do 24.12.09	Mi 13.01.10	

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Nr.	Vorgangsname	Dauer	Anfang	Ende	Vorgänger
149	Vorbereitung Marketing/PR Bremen 2	42 Tage	Mi 13.01.10	Fr 12.03.10	148
150	Technische Vorbereitung Bremen 2	14 Tage	Fr 12.03.10	Do 01.04.10	149
151	Markteintritt Bremen 2	0 Tage	Do 01.04.10	Do 01.04.10	150
152	Implementierungsphase Bremen 2	21 Tage	Do 01.04.10	Do 29.04.10	151
153	Verhandlungen Kiel	14 Tage	Di 23.02.10	Mo 15.03.10	
154	Vorbereitung Marketing/PR Kiel	42 Tage	Mo 15.03.10	Mi 12.05.10	153
155	Technische Vorbereitung Kiel	14 Tage	Mi 12.05.10	Di 01.06.10	154
156	Markteintritt Kiel	0 Tage	Di 01.06.10	Di 01.06.10	155
157	Implementierungsphase Kiel	21 Tage	Di 01.06.10	Di 29.06.10	156
158	Verhandlungen Leipzig 2	14 Tage	Di 23.02.10	Mo 15.03.10	
159	Vorbereitung Marketing/PR Leipzig 2	42 Tage	Mo 15.03.10	Mi 12.05.10	158
160	Technische Vorbereitung Leipzig 2	14 Tage	Mi 12.05.10	Di 01.06.10	159
161	Markteintritt Leipzig 2	0 Tage	Di 01.06.10	Di 01.06.10	160
162	Implementierungsphase Leipzig 2	21 Tage	Di 01.06.10	Di 29.06.10	161
163	Verhandlungen Duisburg 2	14 Tage	Mo 26.04.10	Fr 14.05.10	
164	Vorbereitung Marketing/PR Duisburg 2	42 Tage	Fr 14.05.10	Di 13.07.10	163
165	Technische Vorbereitung Duisburg 2	14 Tage	Di 13.07.10	So 01.08.10	164
166	Markteintritt Duisburg 2	0 Tage	So 01.08.10	So 01.08.10	165
167	Implementierungsphase Duisburg 2	21 Tage	So 01.08.10	Fr 27.08.10	166
168	Verhandlungen Dresden 2	14 Tage	Mo 28.06.10	Fr 16.07.10	
169	Vorbereitung Marketing/PR Dresden 2	42 Tage	Fr 16.07.10	Mo 13.09.10	168
170	Technische Vorbereitung Dresden 2	14 Tage	Mo 13.09.10	Fr 01.10.10	169
171	Markteintritt Dresden 2	0 Tage	Fr 01.10.10	Fr 01.10.10	170
172	Implementierungsphase Dresden 2	21 Tage	Fr 01.10.10	Fr 29.10.10	171
173	Verhandlungen Nürnberg 2	14 Tage	Mi 25.08.10	Di 14.09.10	
174	Vorbereitung Marketing/PR Nürnberg 2	42 Tage	Di 14.09.10	Do 11.11.10	173
175	Technische Vorbereitung Nürnberg 2	14 Tage	Do 11.11.10	Mi 01.12.10	174
176	Markteintritt Nürnberg 2	0 Tage	Mi 01.12.10	Mi 01.12.10	175
177	Implementierungsphase Nürnberg 2	21 Tage	Mi 01.12.10	Mi 29.12.10	176

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Unterbrechung	Sammelvorgang	Externer Meilenstein
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01.05.
01.06.
23.07.
23.07.

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Vorgang	Meilenstein
Unterbrechung	Sammelvorgang
In Arbeit	Projektsammelvorgang

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01.04.
01.06.
01.06.
01.08.
01.10.
01.1

List of Potential Customers in Germany

Through a market research, all city magazines in Germany, and thereby potential customers of CityMob, have been identified.

City	Magazines
Aachen	Bad Aachen, Klenkes, KingKalli - die Familienzeitung für Aachen und Umgebung
Aalen	XAVER
Ahrensburg	Magazin RUNDUM
Aichach	Aichacher Stadtmagazin
Aschaffenburg	FRIZZ Das Magazin, BROT und SPIELE, Mami, Papi und ich - Die Zeitung für die junge Familie
Augsburg	Augsburg Journal, Neue Szene Augsburg
Bad Bramstedt	Bad Bramstedt Live
Bad Homburg	N!TE
Bad Nauheim	N!TE
Bad Segeberg	Bad Segeberg Aktuell, Basses Blatt, Nordexpress
Bad Tölz	Zwergerl Magazin - regionale Familienmagazin
Bad Wörishofen	Bad Wörishofer Stadtmagazin
Bargteheide	Magazin RUNDUM
Bamberg	Fränkische Nacht, Franky, MOHR Stadtillu, Bambolino - Das Familienmagazin für Bamberg und Umgebung, Leporello (Kulturmagazin)
Bautzen	port01CityFlash
Bayreuth	bayreuth4U, MOHR Stadtillu
Berlin	berlinatnight.de, stadtmagazin-berlin, 030 Magazin Berlin, berlinien.de, Frontpage, kulturnews Berlin, Nightlife Berlin, Sergej, Siegessäule, STADTKIND, Tip, zitty, KIEK MAL - die Berliner Kinderzeitung.
Bielefeld	ULTIMO, Bielefelder Spiegel
Bochum	HEINZ-Magazin, coolibri
Bonn	Etabliert: Szene Bonn, Magbo, Rhine Magazine; Unabhängig: Schnüss (seit 1978), KÄNGURU Stadtmagazin für Familien
Braunschweig	chexx - das magazin, Da Capo, COCKTA!L, SUBWAY, ”CLICCLAC” - das Familienmagazin
Bremen	stadtmagazin-bremen.de,BREMER, Bremborium, Mix, PRINZ Bremen, Stadtus Bremen, port01-CityFlash, Kinderzeitung - das Bremer Familienmagazin, Big, szenenight.de
Celle	Celler Scene
Chemnitz	port01-CityFlash, Blitz!, Stadtstreicher, 371,KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt
Coburg	MOHR Stadtillu
Cottbus	port01-CityFlash, hermann, Blickpunkt

Darmstadt	stadtmagazin-darmstadt.de , FRIZZ - Das Magazin, Lakritz - Das Magazin für Kinder und Eltern
Delmenhorst	DELDORADO
Dillingen an der Donau	Dillinger Regionalmagazin
Donauwörth	Donauwörther Stadtmagazin
Dortmund	HEINZ-Magazin, Coolibri
Dresden	SPORTPOOL Dresden, DRESDEN NIGHTLIFE, port01-CityFlash, FRIZZ Das Magazin, SAX, Dresdner, PRINZ Dresden, KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt,Blitz!, Stadtus Dresden , DD-INside, eltern, kind and kegel - Familienmagazin für Dresden und Umland
Duisburg	HEINZ-Magazin, der duisburger
Düsseldorf	NRW LIFE, coolibri, Biograph, PRINZ Düsseldorf, Libelle - Stadtmagazin für Leute mit Kindern, Stadtus Düsseldorf, Rhine Magazine, kulturnews Düsseldorf
Eisenach	diggla - dein stadtmagazin
Erfurt	stadtmagazin-erfurt.de , t.akt, DATEs, Blitz, Die Rampensau,KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt
Erlangen	Partyarea24.de, Cityflash, curt Magazin, LottaLeben.net, hugo!, Doppelpunkt,
Essen	HEINZ-Magazin
Esslingen am Neckar	impress-online.de
Frankfurt am Main	Journal Frankfurt, Journal Planer (Beilage der Frankfurter Rundschau), Frankfurt PUR, PRINZ Frankfurt, Strandgut, N!TE, FRIZZ Das Magazin, kulturnews Frankfurt, Kuckuck! - Frankfurter Familienmagazin
Freiburg im Breisgau	FRIZZ - Das Magazin, Nitebeat, Freiburg aktuell, chilli - das freiburger stadtmagazin, SubCulture, Plan 14, Lichtwolf, Freier Bürger, B. Zetti's findefuchs - Magazin für Eltern und Kinder
Friedberg	Friedberger Stadtmagazin
Friedberg Bayern	Friedberger Stadtmagazin
Fürstenau	Fürstenau aktiv
Fürstenfeldbruck	Fürstenfeldbrucker Stadtmagazin
Fürth	curt Magazin, LottaLeben.net, Doppelpunkt
Fulda	FDate, printzip, CityNews, who-is-hot
Friedrichsdorf	N!TE
Gera	KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt
Germering	Germeringer Stadtmagazin
Gießen	FRIZZ Das Magazin
Gersthofen	Gersthofer Stadtmagazin
Günzburg	Günzburger Stadtmagazin
Gütersloh	GT-Info, guetsel.de
Göppingen	PIG Stadtmagazin, EISBÄR Stadtmagazin Göppingen

Göttingen	pony., diggla, trends and fun, tagessatz, Publiker, Stadtmagazin37, Göttinger Drucksache, Stadtus Göttingen
Halle an der Saale	FRIZZ Das Magazin, Blitz!
Hamburg	Hamburg Aktuell, hamburger-stadtmagazin.de, stadtmagazin-hamburg.de, port01-CityFlash, Hamburg pur, HIER, OXMOX, Piste Hamburg, PRINZ Hamburg, Stadtus Hamburg, Szene Hamburg, kulturnews Hamburg, Bangerang - Stadtmagazin für Familien in Hamburg, UNISCENE - Hamburgs junges Magazin
Hannover	port01-CityFlash, STADTKIND hannovermagazin, Hannover Live, Magascene, Schädelspalter, PRINZ Hannover, Stadtus Hannover, kulturnews Hannover, Hannover Kids - Veranstaltungsmagazin für Kinder und Erwachsene
Heidelberg	FRIZZ Das Magazin, Meier, Pavillon
Heilbronn	Moritz, Phonk
Herne	HEINZ-Magazin
Hildesheim	PUBLIC
Hungen	hungen.info and Internet-Stadtmagazin für Hungen und die Region
Kaiserslautern	Linie Eins - Das Magazin für Lautern and Land
Kassel	FRIZZ Das Magazin, diggla - dein stadtmagazin, Das ist los, Xcentric, Kultur Magazin
Karlsruhe	FRIZZ Das Magazin, INKA Stadtmagazin, Klappe auf, Point, Karlsruher Kind - Die regionale Elternzeitung
Kaufbeuren	Kaufbeurer Stadtmagazin
Kiel	station, ULTIMO Kiel, Tango, kiel4kiel.de, Kinderkram - das Kieler Magazin für Menschen mit Kindern
Köln	StadtRevue (seit 1976), stadtmagazin-koeln, Choices, Einblick, PRINZ Köln (Etablierte Presse), KÄNGURU Stadtmagazin für Familien, Rhine Magazine, Stadtus Köln, kulturnews Köln
Königsbrunn	Königsbrunner Stadtmagazin
Konstanz	Konstanzer Stadtmagazin, paul
Krefeld	Stadtmagazin für Krefeld und Mönchengladbach
Kronberg im Taunus	N!TE
Krumbach	Krumbacher Stadtmagazin
Landau	FRIZZ Das Magazin
Landsberg am Lech	Landsberger Stadtmagazin
Leipzig	SPORTPOOL Leipzig, port01-CityFlash, FRIZZ Das Magazin, KREUZER, Blitz!, PRINZ Leipzig, Stadtus Leipzig, kulturnews Leipzig,KIDS und Co - Das regionale Familienmagazin, 60plusminus - Für Menschen die das Leben kennen, Onlineportal Kribbelbunt

Lichtenfels	MOHR Stadtillu
Lübeck	Piste, Ultimo, Szene, Unser Lübeck
Magdeburg	Stadtmagazin DATEs
Mainz	STUZ, Magazin für Stadt und Campus, Kuckuck! - das Mainzer Familienmagazin
Mannheim, Ludwigshafen	Meier, Tripper, Scala, Pavillon, Stadtus Rhein/Neckar, Das Rhein-Neckar-Kind - Die regionale Elternzeitung
Marburg	Express, FRIZZ Das Magazin, port01-CityFlash
Meitingen	Meitinger Regionalmagazin
Miesbach	Zwergerl Magazin - regionales Familienmagazin
Mönchengladbach	Stadtmagazin
Mülheim an der Ruhr	HEINZ-Magazin
München	stadtmagazin-muenchen.de , munichx.de, munig.com, muenchen24.info, curt Magazin, Applaus, In München, Puccini, GO Stadtmagazin, PRINZ München, FRISCHLUFT, kulturnews München, Kitz Familienmagazin, lessordinary.eu, Haus+Hof Baumagazine.
Münster	na dann, ULTIMO, Stadtgeflüster Münster, GIG
Neubrandenburg	piste
Neuburg	brennessel
Neumarkt in der Oberpfalz	hugo-Das Stadtmagazin
Neusäß	Neusässer Stadtmagazin
Nordhausen	Stadtmagazin Nordhausen-online
Nördlingen	Nördlinger Stadtmagazin
Nürnberg	curt Magazin (Nürnberg), LottaLeben.net, plärrer, MM MonatsMagazin, PRINZ Nürnberg, Doppelpunkt, Stadtus Nürnberg
Oberhausen	HEINZ-Magazin, oberhauser Magazin
Oberursel	N!TE
Oldenburg	MoX, DIABOLO, Stadtpark, CityNews, Oldenburg-Live, Big
Osnabrück	Stadtblatt, GIG, Klecks - Familienmagazin für Osnabrück und Umgebung
Paderborn	das HEFT, Paderborn Journal, Stadtus Paderborn
Pfaffenhofen	Pfaffenhofener Stadtmagazin
Pforzheim	FRIZZ Das Magazin
Pirmasens	P6
Plauen	port01-CityFlash
Potsdam	events, PotsKids! - Das Familienmagazin für Potsdam und Umgebung, POCKET
Preetz	Stadtmagazin Preetz
Regensburg	beste jahre, Filter, DONAUSTRUDL, logo, Regensburger Stadtzeitung, Bagpipes, Der Leserbrief
Remscheid	HEINZ-Magazin
Rendsburg	Rendsburg aktuell
Reutlingen	specs cityguide

Rosenheim	Zwergerl Magazin - regionales Familienmagazin
Rostock	SPORTPOOL Rostock, piste, Stadtus Rostock
Rotenburg (Wümme)	ROW-People.PAPIER
Saarbrücken	LIVE-Magazin, Potat, SaarMag
Schleswig	Schleswig aktuell
Solingen	HEINZ-Magazin
Schrobenhausen	Schrobenhausener Stadtmagazin
Schweinfurt	Groschenheft Veranstaltungsmagazin (seit 1976 ;-))
Schwerin	hauspost, piste
Stade	Stader Brise
Stadthagen	Wir in Stadthagen
Stuttgart	port01 City-Flash, lift, Moritz, Freizeitspiegel, kulturnews Stuttgart, Stadtus Stuttgart, Elternzeitung Luftballon, re.flect
Treuchtlingen	treuchtlinger Stadtmagazin
Traunstein	LUDWIG and [es] Magazin, Rupertistraße 32, Traunstein. Freizeit, Party, Kultur, Konzert und Lifestyle in Südostbayern und Salzburg
Tübingen	specs cityguide
Ulm	FRIZZ Das Magazin, Subculture Ulm, Pocket, Team-Ulm Stadtus Ulm
Warburg	port01-CityFlash
Weimar	port01-CityFlash
Wertingen	Wertinger Regionalmagazin
Wetzlar	FRIZZ Das Magazin
Wiesbaden	STUZ, Magazin für Stadt und Campus
Wiesbaden	vivat Wiesbaden und Rheingau, Magazin für Kultur und Lebensart www.vivat-online.de
Wolfsburg	chexx - das magazin, indigo, COCKTA!L, CLICCLAC - das Familienmagazin
Worms	WO!
Wuppertal	HEINZ-Magazin, zweinullzwei
Würmtal	Wuermtal.Net - Das Magazin
Würzburg	FRIZZ Das Magazin, port01-CityFlash, mamamia - Würzburgs Stadtmagazin für Leute mit Kindern, Leporello (Kulturmagazin)
Zwickau	port01-CityFlash

APPENDIX F

Customer Collaboration Agreement

In this appendix, it will be shown the draft of a collaboration agreement between Munichx and CityMob.

Kooperationsvereinbarung

Die munichx e.K. und Citymob vereinbaren eine dauerhafte Zusammenarbeit zur Entwicklung einer gemeinsamen mobilen Informations- und Kommunikationsplattform (Plattform), die als Zusatzdienst zum bestehenden Portal munichx.de in den Markt eingeführt werden soll.

(1)
Die munichx e.K. leistet Citymob für die technische Umsetzung der gemeinsam entwickelten Plattform Zahlungen in Höhe von € 9000.- in drei Raten. Die Fälligkeit der Raten wird gesondert vereinbart. Die munichx e.K. erhält eine dokumentierte Kopie aller erstellten Programmierungen.

(2)
Die munichx e.K. stellt für die Umsetzung der Citymob Informationen und Datenbankzugänge zur Verfügung. Diese Daten dürfen nicht an dritte weitergegeben oder für andere Projekte ohne schriftliche Zustimmung der munichx e.K. verwendet werden.

(3)
Alle Einnahmen, die über die mobile Plattform generiert werden, werden nach folgendem Schlüssel aufgeteilt: citymob 45%, munichx 55%

(4)
Über die Plattform erhaltene Daten und Userprofile dürfen ohne Zustimmung der munichx e.K. nicht weitergegeben oder für andere Projekte als die munichx-Community verwendet werden.

(5)
Die gemeinsam entwickelte mobile Informations- und Kommunikationsplattform und Teile davon dürfen nur in beiderseitiger Übereinstimmung und nach einer gesonderten Einigung an dritte weitergegeben oder für fremde Projekte verwendet werden.

(6)
Für den Fall eines einseitigen Ausstiegs der Citymob aus dem gemeinsamen Projekt, wird sichergestellt, dass die munichx e.K. alle nötigen Daten und Programmierungen erhält und in Stand gesetzt wird, dass Projekt ggf. alleine weiterzuführen.

(7)
Citymob übernimmt das Hosting der für die Plattform notwendigen Server.

(8)
munichx und Citymob kümmern sich gemeinsam um die Promotion und Verbreitung der neuen Plattform.

Figure F.1: Draft of collaboration agreement between Munichx and CityMob

Team Collaboration Agreement

In this appendix, it will be shown the mutual collaboration agreement between the four entrepreneurs.

1

Samarbeidsavtale for gründerene av CityMob

Dette er en samarbeidsavtale utformet den 31. januar 2007 av Petter Johannessen, Jan Sindre Isene, Håkon Abrahamsen og Axel Lefébure. Ved å underskrive denne plikter vi oss alle til å respektere denne.

Master og bedrift skal prioriteres likt, og vi skal tilstrebe at de utfyller hverandre. Masteren skal følge bedriftens progresjon

Vi skal vise respekt for hverandre og hverandres meninger

Viktige avgjørelser skal taes i plenum. I låste situasjoner eller ved mangel på informasjon, skal eksterne resurser trekkes inn. Tidsbruk tilpasses viktighet

Slik at alle skal føle tilhørlighet til produktet og bedrifte, og slik at alle skal ha en overordnet forståelse for arbeidet vi gjør, skal alle være med på å utforme produktet og bedriften, sette mål, og definere strategier

Vi skal bruke de tilgjengelige resursene vi har så mye som nødvendig og hensiktsmessig

Vi skal drive prosessen videre gjennom god kommunikasjon og dermed også hindre problemer

Kritikk skal være konstruktiv

Vi skal si fra om problemer

Veiledende arbeidstid er fra 09 til 17 på hverdager. Vi skal alle gjøre vårt beste for å gjøre mest mulig ut av Masteren og bedriften.

Vi skal minst ha et team møte på mandager og et prosessmøte på fredager.

Vi skal bruke avtalte systemer eller foreslå endringer

Vi skal ta utganspunkt i at alle er med selv om en drar i sommer

Vi skal sette av tid til sosiale ting.

Petter Johannessen	Jan Sindre Isene	Håkon Abrahamsen	Axel Lefébure