Praeda&Co. formerly Boomerang

MuzikMekan

Requirement Analysis Report

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1 Contents

2 Introduction

This report is intended to describe the requirements of “MuzikMekan” project of group “Praeda&Co.” (formerly known as “Boomerang”). In this report, the field research regarding the project is explained, detailed use cases and requirements are described and the road map of the project is presented.

2.1 Background Information

Together with the rapidly developing mobile industry, mobile device producers offer lots of beneficial alternatives to their customers. Therefore people are getting used to take advantage of their mobile devices for their daily experiences.

Also social networks are used by millions of people in today’s world. People like the idea of become closer to their friends or share their experiences with them using social networks. They use also some services for discovering new tastes. Hence the importance of social networks increases drastically so the number of their users does.

One of the biggest problems of online social networks is that it makes people more asocial. They discourage people to go outside and meet their friends. Therefore it is a good idea to combine the advantages of social networks with daily activities. Although there are some social networks that attempt to do this, most of them are not successful on mobile area.

As known, the musical taste of people is important to decide where to go for having fun. Moreover the style of the other people in a place is another important factor for this decision. Even though there are some web sites providing some services to inform people about the quality of an entertainment place in terms of musical style, none of them offers live services to follow which kind of songs are playing in a place and what kind of people are inside this place right now.

2.2 Scope (Project Summary)

“MuzikMekan” project aims to offer solutions for deficiencies stated at Background Information. “Praeda&Co.” is going to develop a social network which can be used on mobile devices. The main goal of this social network is to help people for deciding where to go for entertainment. Our system is going to provide people with live information about a place which makes our social network different than others. It will enable their users to meet new people that have similar tastes in terms of music and entertainment. Additionally the system is going to inform place owners about what kind of people is inside their place, so they can play songs according to visitors’ tastes. The system is going to achieve this by using geological information of users which comes from GPS devices or triangulation and musical information which comes via Last.fm.

"MuzikMekan" project firstly aims to develop a flexible infrastructure that enables any client program to interact with the system easily. The development team intends to achieve this by focusing on developing infrastructure as web services. And also the team has to show the capabilities of the system by implementing a client application. Therefore, after implementing the infrastructure, the team will develop an Android application that utilizes all the capabilities of the mainframe.

The project will provide the users with following advantages:

2.2.1 Why Customers Use

- Learning the musical history of a venue and following what kind of music is being played in a venue right now.
- Tracking what kind of people inside a venue.
- Getting suggestions for new places according to musical taste of the user.

- Synchronizing their profile with Facebook, Last.Fm and Twitter and enabling automatic status updates according to their locations.
- Getting more realistic information when selecting a venue.
- Encouraging people to be more social, unlike other online social networks.

2.2.2 Why Owners Use

- Learning what kind of people inside their venue and adjust their services according to this information.
- Presenting their venue to customers efficiently.

2.3 Team Summary

Our team is composed of four senior Computer Engineering students. The members of the team are Gökhan Tüysüz, Cansın Yıldız, Eray Molla and Murat Ongan which aim to create an impressive application that is used by lots of people.

3 Research

3.1 Marketing Research

In this section, currently available products in the social networking market that are close to the project "MuzikMekan" are explained, and further discussion about their pros and cons are made.

3.1.1 Mekanist.net

Mekanist.net is a social network platform where people can share, rate and comment about places that they visit in daily life.

At Mekanist.net, one can mark places on map, tag them and comment about them. Also people can search places. But there's no intelligent suggestion mechanism like in project "MuzikMekan". Also it must be stated that Mekanist.net doesn't focus on specific interest area such as music places.

This social network's target audience is Turkish people and it is only accessible via web using browser. Although it has some functionality like SMS queries, they're so limited that it doesn't even provide an interface for mobile devices.

3.1.2 Wertago

Wertago is a mobile application for night lifers. At Wertago, one can get informed about venues, coordinate plans with friends and share their night life activities. Also it's possible to review venues.[1] All these capability will be available at project "MuzikMekan".

At Wertago, people can see each other's profile and communicate just like in any social network. But what Wertago is different is that it aims to make venue owners participate in this social network like project "MuzikMekan" will do.

What "MuzikMekan" differs from Wertago is that "MuzikMekan" aims to inform people about venues, but specifically about what kind of music they play.

[1] http://wertago.com/

3.2 Technology Research

3.2.1 Social Networks

As it is mentioned at Introduction, the project aims to create a new social network. For this reason, Praeda&Co. researched some social networks. Thus, the general information about these networks has been gathered and pros/cons of them analyzed.

3.2.1.1 Last.fm

Last.fm is a dominant asset in the social network world. The number of its users is increasing rapidly and almost all the people who are in a close interaction with social life in the web have a Last.fm account.

Last.fm has great capabilities on generating a profile according to the music that user listens. Moreover, on account of the information about user, last.fm does recommend further and new artists and tracks and the most importantly it searches and informs the users about the other users that have similar music tastes.

Fortunately, Last.fm has an API that can be used in the development of the projects. For instance, thanks to the functionality of the API, developer can reach the information about the user that is desired. In the "MuzikMekan" project, the details about the users can be used to create a profile of the place that is visited by these users. Furthermore, the information about the current tendency about this place can be made available to the "MuzikMekan" users. Additionally, by using Last.fm, the venue owners can push what they play in their place and our system will get use of this data and will inform our users about it.

3.2.1.2 Facebook

Facebook is the platform that most of the people are mainly using to communicate with, and trace the activities of their friends. As users check their Facebook accounts regularly, it will be informative to change the status and publishing new feeds about "MuzikMekan" users; moreover, it is desirable for both social network users. Additionally, a Facebook application about the user profile on "MuzikMekan" may increase the popularity and attractiveness of "MuzikMekan".

3.2.1.3 Twitter

"Twitter is a free social networking and micro-blogging service that allows its users to send and read other users' updates (otherwise known as tweets), which are text-based posts of up to 140 characters in length."[2]

As Twitter is used only for the current status of the user what he is doing at that time in a text format, "MuzikMekan" will be able to push where the user is to Twitter.

3.2.2 Development Platforms

3.2.2.1 Android

"Android is a software platform and operating system for mobile devices, based on the Linux kernel, and developed by Google and later the Open Handset Alliance. It allows developers to write managed code in the Java language, controlling the phone via Google-developed Java libraries."[3]

[2] http://en.wikipedia.org/wiki/Twitter

[3] http://en.wikipedia.org/wiki/Google_android

Since Android is an open source project and a new technology, it is most suitable for entrepreneurs like Prade&Co, because there is not much application developed for Android as other platforms have.

In addition, it's API has lots of capabilities which will form the core of "MuzikMekan". Some can be listed as, 'com.google.android.maps' (handles Google Maps), 'android.location' (handles GPS) [4] packages.

Also, since Android has a Linux kernel, Praeda&Co. will be more comfortable working on it.

3.2.2.2 iPhone

"iPhone OS or OS X iPhone is the operating system developed by Apple Inc. for the iPhone and iPod touch."[5]

iPhone has an App Store where developers can sell their products. This can be a good opportunity for companies like Praeda&Co., which have never sold mobile products.

Although iPhone OS offers a good API and development environment for developers, the biggest drawback of iPhone OS is that it lacks both Java and Flash support. This can be a problem for the future steps of our project. Hence, the development of first mobile client side implementation of "MuzikMekan" will not be on iPhone OS.

3.2.2.3 Symbian

"Symbian OS is an open operating system, designed for mobile devices, with associated libraries, user interface frameworks and reference implementations of common tools, produced by Symbian Ltd."[6]

Despite the fact that Symbian is the most popular operating system among mobile industry, it's stated nearly at all web sites[7] about mobile development that Symbian Application Development is difficult. Also, "MuzikMekan" depends on Google Maps and since there is no native Google Maps API, Symbian OS is not the best choice.

3.2.2.4 Windows Mobile

"The Windows Mobile platform is an open platform that supports needs beyond mobile messaging. It's based on Microsoft .NET, giving developers freedom to innovate."[8]

Since Windows Mobile APIs and development tools are not open-source and since they are not free to use for commercial purposes, it can limit the "MuzikMekan" project's future and this makes Windows Mobile a bad choice. Additionally since Praeda&Co. members do not have experience on Windows development environments, selection of more familiar environments is more suitable.

3.2.3 Programming Languages

3.2.3.1 PHP

"PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML."[9] Although PHP application development is very easy and it is easy to find a hosting firm, its structure is less suitable for big scaled projects.

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[4] http://code.google.com/android/toolbox/apis/lbs.html
[5] http://en.wikipedia.org/wiki/IPhone_OS
[6] http://en.wikipedia.org/wiki/Symbian_OS
[7] http://wiki.openmoko.org/wiki/Why_Openmoko#Symbian_OS
[8] http://www.microsoft.com/canada/windowsmobile/wm07/articles/benefits.mspx
[9] http://www.php.net/

3.2.3.2 Java

Java is both a programming language and a platform. Java programs are written by using Java programming language and they run on Java platforms.[10]

As it is mentioned Part 3.2.2 client side of the "MuzikMekan" project is intended to be developed for "Android". Since Android provides API's for Java language[11], client side of "MuzikMekan" is going to be developed on Java environment.

And also Java provides robust technologies for server side application development. It is generally the first choice for business application developers because there are lots of solid frameworks that are prepared for this goal. Since "MuzikMekan" will also be reachable on the web, Java technologies like Spring, JSF, Hibernate etc. will be used for development this part of "MuzikMekan". Moreover "Praeda&Co." members believe that since the client side of the project will be developed on Java environment, to prepare the server side on this environment, too, will provide homogeneousness and this will make development elegant.

3.2.3.3 .NET

The Microsoft .NET Framework is a software technology that is available with several Microsoft Windows operating systems. It includes a large library of pre-coded solutions to common programming problems and a virtual machine that manages the execution of programs written specifically for the framework.[12]

In spite of the fact that .NET framework is highly integrated and it is designed to handle big scaled projects, development environments and tools are not free to use. Therefore .NET usage can limit the future of the project.

3.2.4 Database Servers

Since Praeda&Co. does not have enough knowledge to do a reasonable benchmarking among DBMSs, the team plans to consult in a professional for selecting one of the alternatives: MySQL, PostgreSQL, DB2, MsSQL, and Oracle. But presently MySQL is our choice. Because MySQL is free software and according to researches it has most of the abilities of a DBMS should have. Additionally it is easy to host because lots of hosting firms offer MySQL services.

[10] http://java.sun.com/docs/books/tutorial/getStarted/intro/definition.html
[11] http://code.google.com/android/documentation.html
[12] http://en.wikipedia.org/wiki/Microsoft_.NET#Microsoft_.NET

4 Requirements

4.1 Functional Requirements

4.1.1 Data Flow and Interfaces

The data flow within the system and the external interfaces are illustrated in the data flow diagrams below. As it can be seen from the diagrams, the application is mainly interacts with user as a mobile application. The system also gets location information from mobile devices. This data can be gathered by GPS or other location services provided by mobile phone operators. The Android API will be used to get this information from mobile device. Other system services like, Internet communication and map services are also provided by Android API.

The system also communicates with other social network applications with their web services. This communication will be handled by the server part of MuzikMekan system using REST and SOA interfaces of Last.fm, Facebook, Twitter and other related social networks.

4.1.1.1 Level 0

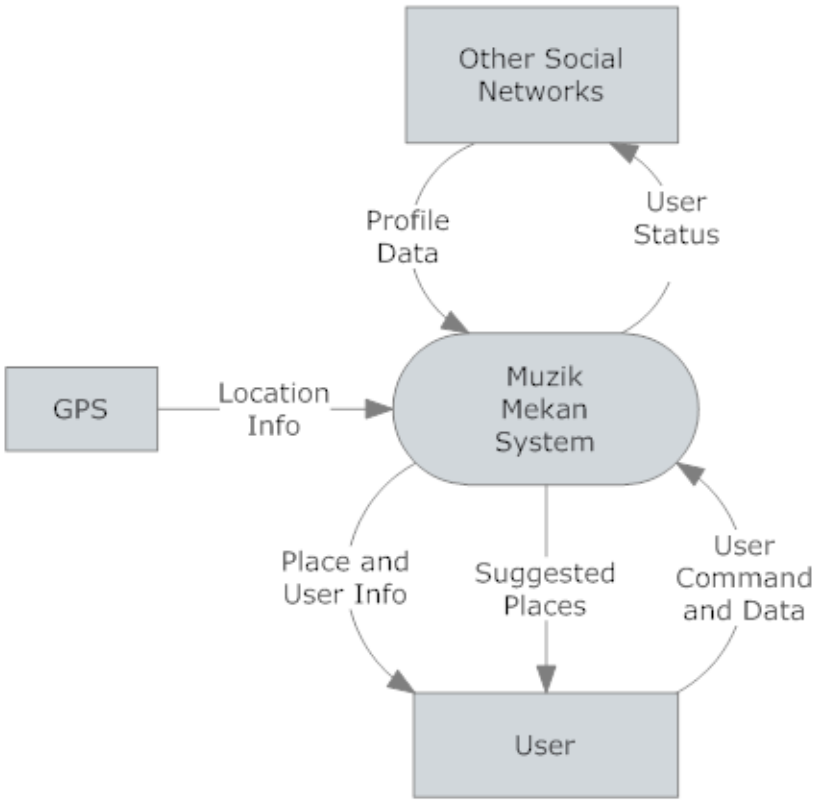

Figure 1 - Context Level DFD

4.1.1.2 Level 1: MuzikMekan System

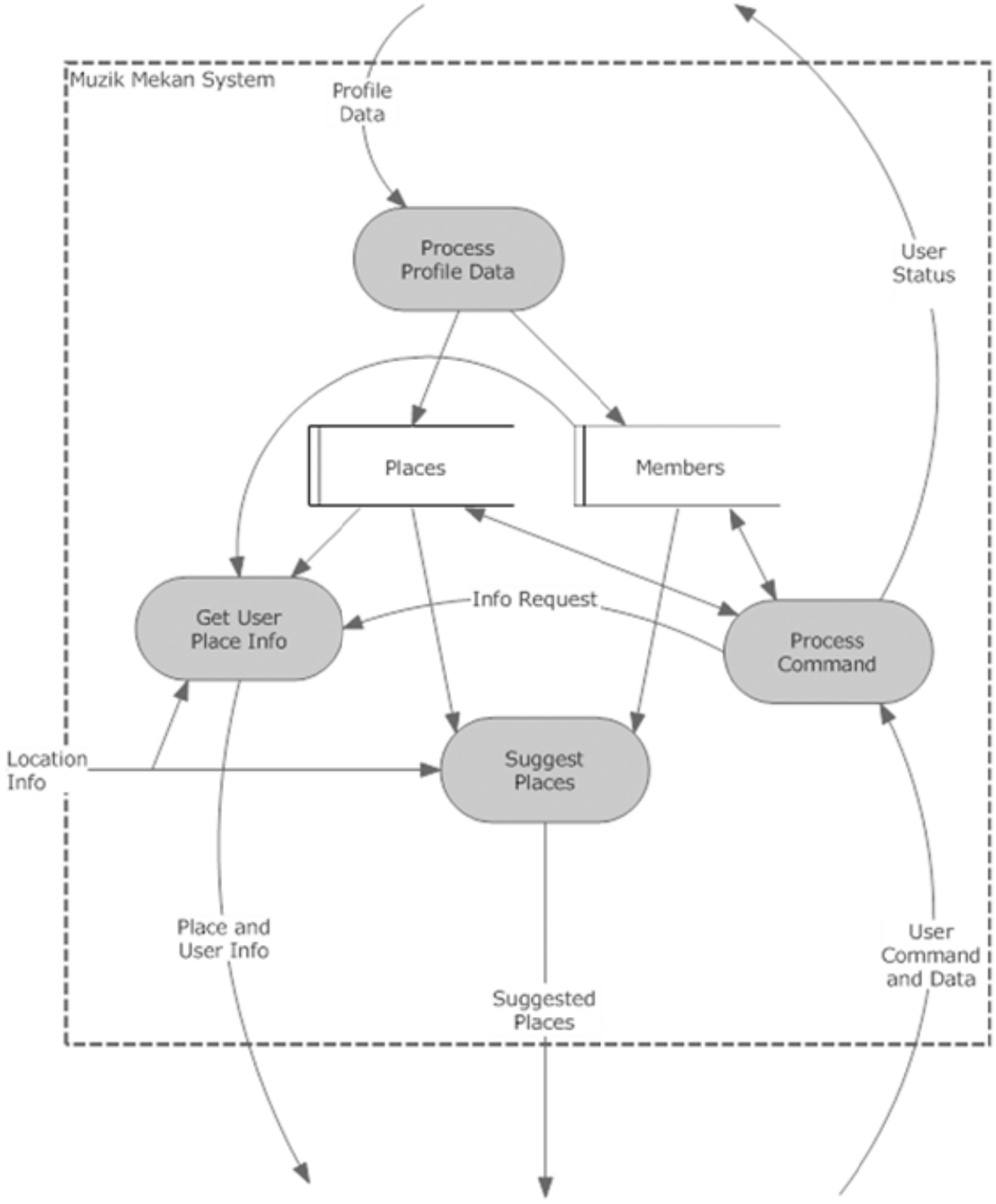

Figure 2 - MuzikMekan System Level 1 DFD

4.1.1.3 Level 2: Process Command

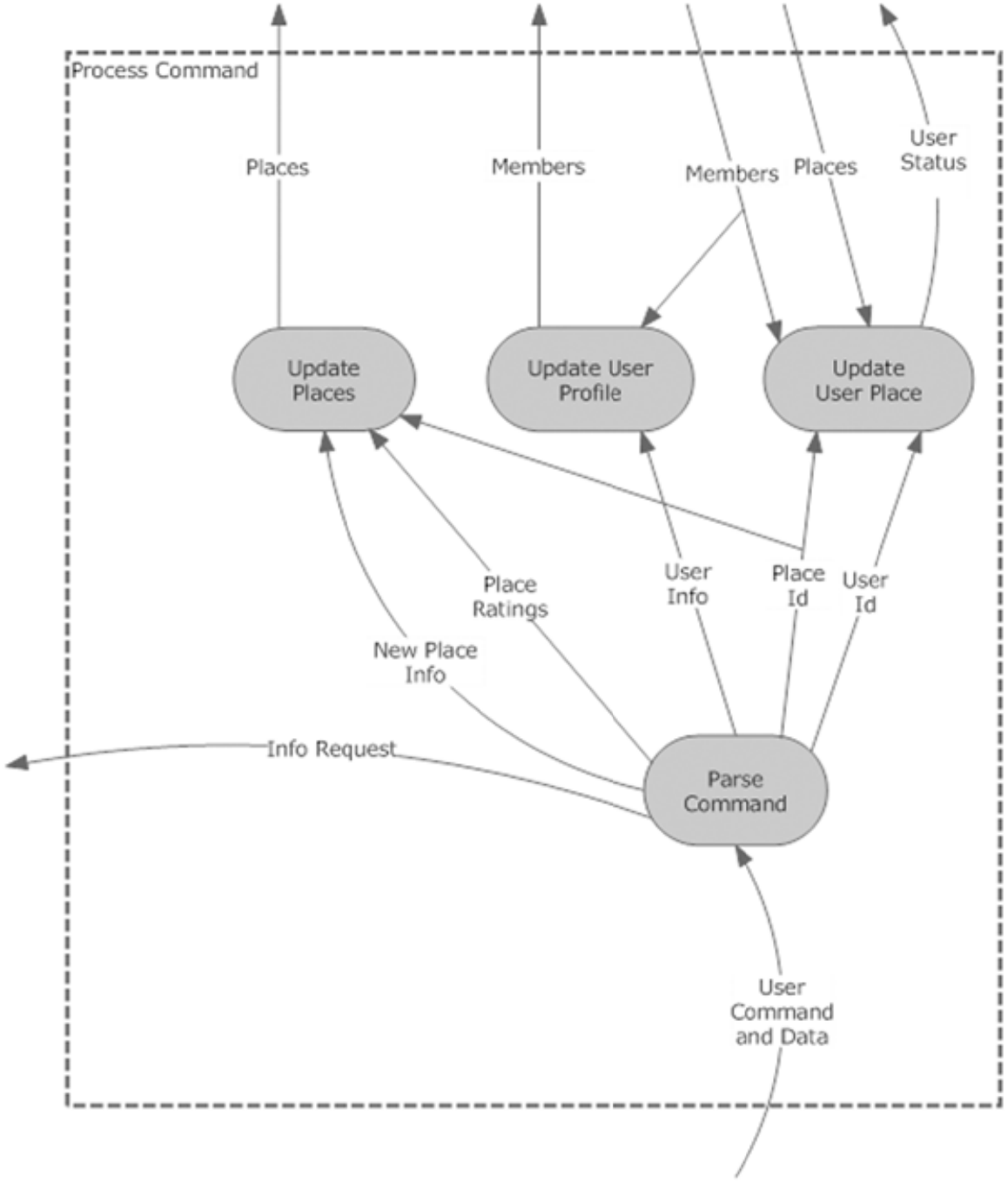

Figure 3 - Process Command Level 2 DFD

4.1.1.4 Level 2: Get User Place Info

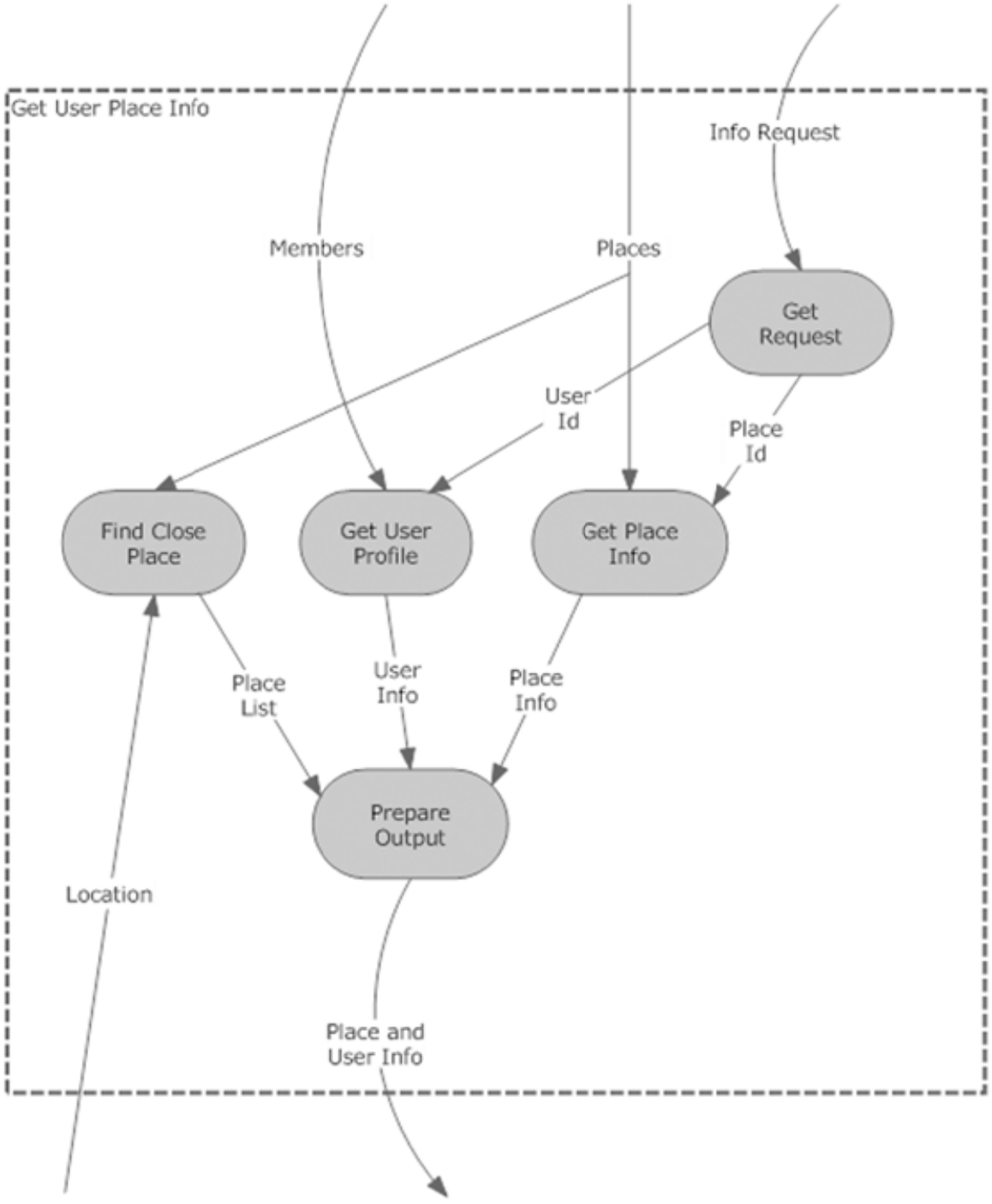

Figure 4 - Get User Place Info Level 2 DFD

4.1.2 Use Cases

The main features and functional requirements of the MuzikMekan application are described as use cases in this section.

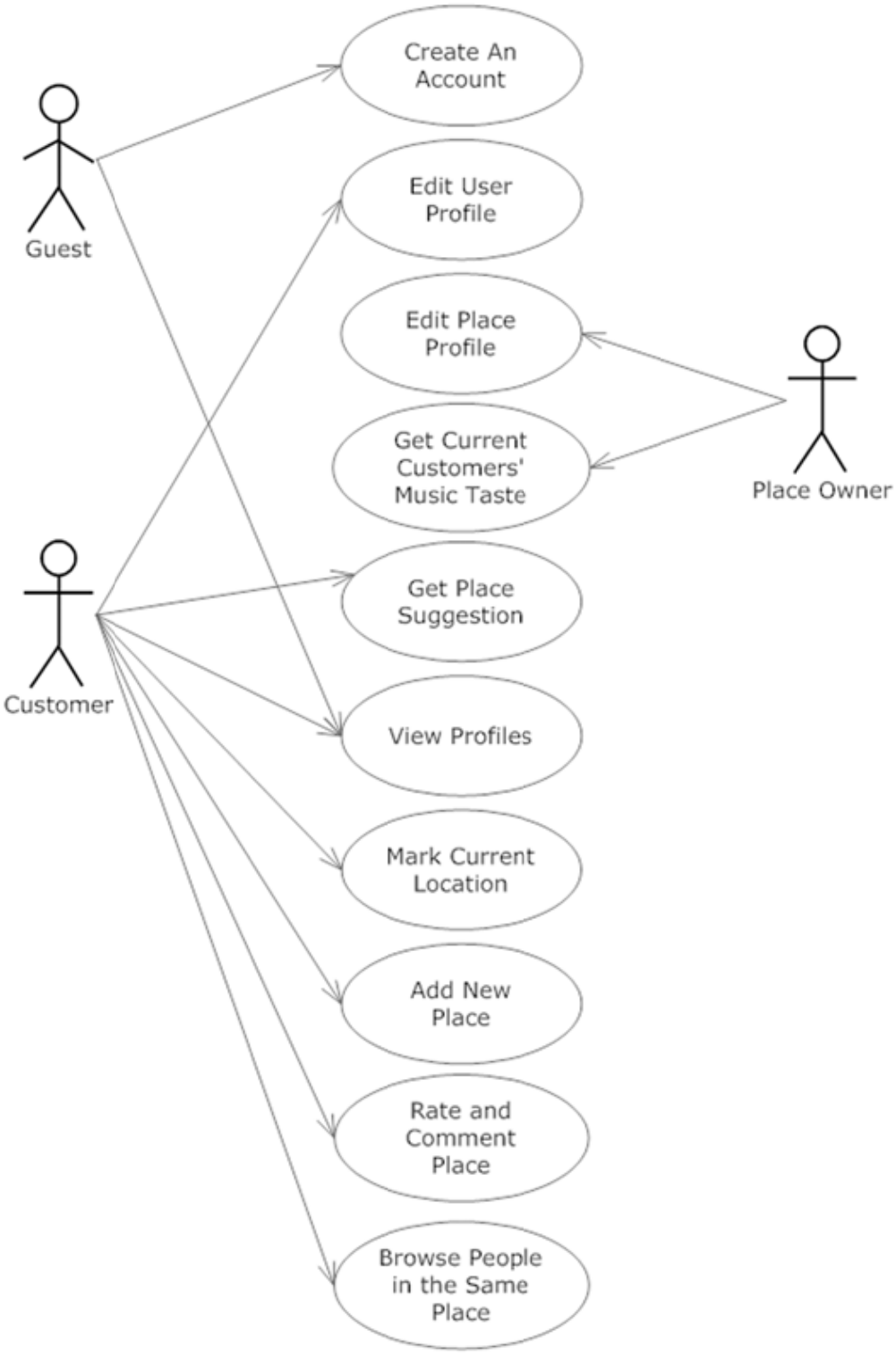

Figure 5 - Use Case Diagram

4.1.2.1 Create an Account

- **Description :** User must have an account to use the specific features of the application
- **Assumption:** This use case is both for place owners and customers.
- **Steps :**
    1. Guest enters application's web interface and accesses the registration form.
    2. Guest fills the form and registers to the system with a unique user name.
    3. User synchronizes their account with other social network accounts (e.g. Last.fm, Twitter, Facebook) if exists.
    4. User sets the privacy configuration as he desires.

4.1.2.2 Edit User Profile

- **Description :** Users are able to make changes on their user profiles
- **Assumption:** User has logged in into MuzikMekan system.
- **Steps :**
    1. User accesses his profile by selecting the "Edit my profile" menu.
    2. User updates his personal information and settings created in registration.
    3. System saves changes when user clicks the "save" button.

4.1.2.3 Edit Place Profile

- **Description :** Place owner are able to make updates and publish information about events in their place
- **Assumption:** Place owner has registered into system and his account has been approved by the administrator(s).
- **Steps :**
    1. Place owner accesses his place's profile by selecting the "Edit profile" menu.
    2. Owner modifies the general information about the place.
    3. He enters upcoming events which are going to be held in this place.
    4. System publishes the changes after transaction is completed.

4.1.2.4 Get Current Customers' Dominant Music Taste

- **Description:** Place owner wants to learn music taste of the people currently in the place in order to play familiar songs to the customers.
- **Assumption:** A number of users have stated that, they are in that place currently.
- **Steps:**
    1. Place owner opens his own place's profile.
    2. System gets the list of users in the place.
    3. System compares and combines the music preferences of these users.
    4. System displays the dominant music taste of the place.

4.1.2.5 Get Place Suggestion

- **Description:** Users are able to discover new entertainment places according to his music taste and friends.
- **Assumption:** System has enough information about user preferences to make appropriate suggestions to the user.
- **Steps :**

1. User initializes the suggestion operation by selecting it on the main menu.
2. User may select other friends who will come with him, to get a common suggestion.
3. System determines the list of places that are close to user.
4. System calculates the compatibility ratings of these places according to users previous experiences and music taste
5. System displays these places ordered by the ratings and marks them on a map widget.

4.1.2.6 View Profiles

- **Description:** Users are able to view the profile of other users (according to privacy settings of other users) or places.
- **Steps :**
    1. User initializes the "view profile" functionality.
    2. System asks the name of the user/place which user wants to explore.
    3. System displays the corresponding results related to user's request.
    4. User accesses the related profile by selecting the appropriate result.

4.1.2.7 Mark and Push Location Status

- **Description:** Users are able to mark the place that they are in and publish this feed to other social networks.
- **Assumption:** User has a mobile phone where location service is available.
- **Steps :**
    1. User selects "mark location" menu in the main screen.
    2. System gets the location of the user and displays places near him.
    3. User selects the place where he currently is.
    4. System pushes the location information to other social networks in which user has an associated account.
    5. System displays a form to user in order to get opinions of user about the place.

4.1.2.8 Add New Places

- **Description:** Users are able to add places, which are not currently in the database.
- **Assumptions:**
    - User knows the name and location of a place.
    - The place has not been registered yet.
- **Steps:**
    1. User initializes the "add place" operation by selecting the appropriate item.
    2. System displays the city map
    3. User marks the location of the place on the map.
    4. User enters name and description about the place.

4.1.2.9 Rate and Comment Places

- **Description:** Users shall enter their opinions about places they're visited.
- **Assumptions:**
    - The place has already been registered in the database.
    - User has visited this place before.
- **Steps:**
    1. User accesses the place opinion form by

a. marking the current place (refer to the use case #5) OR
b. viewing the profile of a previously visited place (refer to the use case #4)

2. User gives a rating to the place in a particular scale (e.g. over five)
3. User shares his opinions by making comments about the place.
4. User assigns tags to the place.
5. System updates the overall rating of the place and adds new comment to the database.

4.1.2.10 Browse People in the Same Place

- **Description:** User can browse the profiles of the users in the same place considering the privacy settings of the users
- **Assumption:** User has stated that he is in a particular place.
- **Steps:**
  1. User initializes this function by selecting the "who is near me" menu.
  2. System gets the list of the people in that place.
  3. System filters and displays the user list according to privacy settings.

4.2 Non-Functional Requirements

4.2.1 Runtime Requirements

1. **Usability:** The system should have easy user interfaces. It should have min. number of interface steps for any facility that it supports to user at client side.

2. **Documentation:** The system should include a client side tutorial to ease user's experience. Also a more detailed online documentation about the system's usage should be prepared.

3. **Availability/Reliability:** The system should be available to its users almost every time. When it's not possible to reach the system's server side, the client side application should log events of the user for further push to server.

4. **Scalability:** The system should able to be used when it have 100 – 100.000 clients. So, an automated logic behind the system is mandatory. (i.e. An approach where admins control data legibility will most probably fail.) Also the facilities supported to users should not depend on much user crowd. Almost all facilities should be meaningful when the system has less or more users.

5. **Security:** The system's client and server side should communicate with each other through a secure way, like https, since client side will push personal info. about user.

6. **Quality of Service Req.s:** System should be able to process at least 10000 transactions between server-client per minute.

4.2.2 Development Requirements

1. **Localizability:** The system doesn't have to localizable necessarily. But an approach which enables localizability in the future could be beneficial.

2. **Modifiability/Extensibility:** The system should have enough modularity so that it could be extended by new features/facilities for users in the future.

3. **Portability:** The system's server-client communication should be platform-independent. i.e. It should allow Praeda&Co. to develop new client-side applications to other platform's then Android, like iPhone, Symbian.

4.3 System Requirements

4.3.1 Client Side Requirements

1. **Hardware Requirements:** The minimal requirements are 32 megabytes of RAM, 32 megabytes of flash, and a 200-megahertz online processor.
2. **Software Requirements:** The minimal requirement is to have Android OS to be installed.

4.3.2 Server Side Requirements

1. **Hardware Requirements:** The minimal requirements are Celeron® 2.0GHz Processor with 1x120 GB disk drive, 1 GB RAM and 5 Mbps Broadband Internet Connection.
2. **Software Requirements:** Any Linux OS with Java Virtual Machine and a Database Server.

5 Project Schedule

The roadmap of the MuzikMekan project is illustrated as a Gantt Chart at Appendix.

6 Conclusion

This report aimed to show our project's requirement details in terms of several aspects. First, a brief summary of "MuzikMekan" is introduced. Then, a marketing and technology research is carried out and results are established. And at the main part, the requirement details of the project are described. As a last work, project's schedule is presented.

This report tried to focus on the aspects which thought to be important. So, there is no part that reflects irrelevant or useless information.

This report was very useful for clarifying the project's scope. Also, it'll be beneficial for further planning.

#	Name	Start	Finish
1	**Analysis**	**9/19/2008**	**11/13/2008**
2	Topic Selection	9/19/2008	9/23/2008
3	Proposal	9/29/2008	10/14/2008
4	**Field Research**	**10/15/2008**	**11/4/2008**
5	Marketing Research	10/15/2008	10/24/2008
6	Technology Research	10/22/2008	11/4/2008
7	Requirement Analysis	11/3/2008	11/13/2008
8	Milestone (SRS)	11/13/2008	
9	**Initial Design**	**11/13/2008**	**12/5/2008**
10	Components	11/13/2008	11/24/2008
11	Interfaces	11/17/2008	12/1/2008
12	Data Specifications	11/25/2008	12/5/2008
13	Milestone (Initial Design Report)	12/5/2008	
14	**Detailed Design**	**12/5/2008**	**1/16/2009**
15	User Interface Drafts	12/5/2008	1/1/2009
16	Communication and Web Services	12/9/2008	12/29/2008
17	Database Design	12/5/2008	12/22/2008
18	Class Hierarchy	12/30/2008	1/15/2009
19	Milestone (Detailed Design Report)	1/16/2009	
20	**Implementation**	**1/8/2009**	**5/29/2009**
21	Google Maps Integration	1/8/2009	1/14/2009
22	Android Client GUI Prototype	1/8/2009	1/23/2009
23	Venue Profiles	1/15/2009	1/23/2009
24	Milestone (Prototype)	1/26/2009	
25	Authentication/Authorization System	1/26/2009	2/10/2009
26	CPS Integration	1/26/2009	2/10/2009
27	Venue Marking/Commenting System	2/11/2009	2/23/2009
28	Milestone (Release 1)	2/24/2009	
29	User Profiles	2/24/2009	3/13/2009
30	Networking and Friendship	3/16/2009	4/10/2009
31	Messaging System	3/16/2009	4/10/2009
32	Milestone (Release 2)	4/13/2009	
33	Last.Fm Integration	4/13/2009	4/30/2009
34	Suggestion System	5/1/2009	5/23/2009
35	Social Networks Integration	5/4/2009	5/29/2009
36	Test & Debug	1/16/2009	5/29/2009
37	Developer Documentation	1/16/2009	5/29/2009
38	End User Manual	5/18/2009	5/29/2009
39	Milestone (Final)	5/29/2009