



Bilkent University

Department of Computer Engineering

Senior Design Project

Project name: DAOS (Dealership Assistance and Optimization System)

Project Specifications Report

Metehan Kesekler, Kerem Tuna Özlü, Mustafa Said Sarı, Sarp Tuğberk Topallar

Supervisor: Uğur Doğrusöz

Jury Members: M.Mustafa Özdal and Mehmet Koyutürk

This report is submitted to the Department of Computer Engineering of Bilkent University in partial fulfillment of the requirements of the Senior Design Project course CS491/2.

1. Introduction	2
1.1 Description	3
1.2 Constraints	3
1.2.1 Implementation Constraints	3
1.2.2 Economical Constraints	4
1.2.3 Sustainability Constraints	4
1.2.4 Language Constraints	4
1.2.5 Legal Constraints	4
1.2.6 Security Constraints	4
1.2.7 Time Constraints	4
1.2.8 Ethical Constraints	4
1.3 Professional and Ethical Issues	5
2. Requirements	5
2.1 Functional Requirements	5
2.2 Non-Functional Requirements	6
3. References	6

1. Introduction

When dealerships are given by companies to third parties, two of the most essential concerns are legality and profitability for such a dealership. Both of these issues can be addressed by selecting the appropriate location for the dealership. Finding such proper locations manually is very troublesome, because one must obtain information about the legal restrictions and regulations about the area. These restrictions and regulations may differ from province to province, even sometimes municipalities within the same province enforce different regulations. In addition to that, profitability potential is very hard to measure and may be affected by many factors such as weather, time of the day, seasonal activities of the locals, shopping demographic of the area etc. Even if these potential factors are successfully be identified initially, they may also change later on. Luckily, all these problems are dependent of the location of the dealership and using a geographic information system (GIS) can be helpful to solve all of them.

The issue of legality is very area sensitive and different constraints must be met for different types of businesses. For example, liquor and tobacco shops cannot be nearer than 100 meters to schools, dorms or sanctuaries by law. Therefore, having such sensitive places as points of interest (POI) in DAOS and display them on the actual map would certainly be very beneficial for companies trying to pick up the right venue for the regulatory assessment.

When the profit potential of a dealership is considered, the area can be manually inspected. But manual inspection can be made for a limited amount of time and therefore may not be enough to cover the overall trend for the area. Sending a team to different cities around the country for field surveys is also very costly. DAOS will present the data about spending potential of the area such as number of residents in the area and the foot traffic of the streets. Data provided by DAOS can be interpreted to become aware of the trends about the area even it could be used for making suggestions about possible business opportunities since the information about the area is accumulated in the database.

After the dealership becomes operational, its performance must be continuously observed. Because, the habits of the customers are not static and businesses are very sensitive to competition. So, a very profitable location for a dealership may not be still profitable so monitoring the operations of that dealership can be very important for making a decision about allocating more resources there or closing it entirely. Monitoring the sales of different branches only provides information about quantity, but considering branch sales according to their local shopper profile will give their actual performance metric for evaluation.

Our solution, DAOS with its enhanced user interface, interactive and color coded maps and broad capabilities about different types of businesses, provides the answers for the following questions “Can this dealership be opened here?”, “Should this dealership be opened here?” and “Is this dealership still profitable?”

1.1 Description

Purpose of the project is to develop a special tool based on geographic information system and sales database to provide recommendations to companies for selecting the best dealership locations and optimizing the sales performance and profits.

Selecting the right location for a new dealership which will comply with regulatory constraints and at the same time generate and sustain maximum profitability is a costly and long process by using only conventional tools and field visits. When a company wants to expand their branches their expansion policy is very important, for the companies that are careful and selective about their decisions they will spend time and money to find an optimal location for adding it to their network. Instead of spending money and time for different professionals to handle legal, regional or monitoring requirements iteratively we combine this operations in one very easily understandable UI to provide the chance of handling them all in a single place and on a single time whether for expansion of their brand or auditing their profitability of their continuing service. This process allow us to provide the most carefully calculated information to our customers even recommending new opportunities to them.

1.2 Constraints

1.2.1 Implementation Constraints

- Collaboration tool for this project will be GitHub and our informative webpage will be <http://metehank.github.io/>.
- Our program will be a web based utility that prioritizes client server architecture.
- MySQL database will be used to store user and geographical data.
- Object oriented languages will be preferred on the implementation of the server side.
- Web clients will be implemented on JavaScript.
- Besides from user provided data our system will use information provided by Google Maps, Yandex, Solvoyo, PlusOneMinusOne, Neozeka, Capgemini, etc. via their interfaces.

1.2.2 Economical Constraints

- The frameworks and libraries will be obtained without fee.
- The web client needs a domain and a hosting service which will require payments.
- A server is needed to contain our data and backend processing.
- Statistical data may need to be purchased by professional analytics.
- Some free APIs require payments after a certain level of data usage.

1.2.3 Sustainability Constraints

- Constant flow of analytics data will be needed to keep the system as accurate as possible.
- Uninterrupted server service is needed.
- Database should be updated frequently.
- After a certain threshold scalable database solutions may be needed.

1.2.4 Language Constraints

- Turkish is our default program interface language since we work with Turkish companies we are not planning to support any other languages for now.

1.2.5 Legal Constraints

- Since there are regulatory limitations on the actual dealerships themselves our system must also abide this limitations and recommend accordingly.

1.2.6 Security Constraints

- Clients will provide their credentials via login in.
- Data provided by our users (i.e. sales information, personal information etc.) and the analysis data created by DAOS will be secured and will not be shared to third parties.

1.2.7 Time Constraints

- The specified reports must be delivered on time also the implementation must be as complete as possible for the demo.

1.2.8 Ethical Constraints

- We will abide by the code of ethics of national society of professional engineers [1].
- We will treat every user evenly and objectively to prevent unfair profits especially if two distinct customers are in the same sector.
- Users can access only their own data we aim to prevent competition through our system.

1.3 Professional and Ethical Issues

- During the development of our project, we will comply with the Code of Ethics outlined by the National Society of Professional Engineers.
- In order to protect private and confidential information of the users, no user data will be shared with any third parties. A mutual non-disclosure agreement (NDA) will be signed with the users.
- Our system will partially rely on data obtained from third party suppliers, there is no guarantee about the accuracy of this type of data. We will share a disclaimer clause with our users warning them about this issue.

2. Requirements

2.1 Functional Requirements

- Name, owner's information, open addresses, sales information and geo-codes of dealerships will be held in dealership database.
- Foot traffic, prize of dealerships per meter square, statistical information and POIs(Point of Interests) will be held in region database.
- By using our sophisticated algorithm, performance information for existing dealerships and optimal location for potential dealerships will be created.
- In accordance of performance information, colors will be assigned to cities and counties in order to sort out the good from the bad.
- Performance information in a good user interface will be provided to user.
- An optimal area will be suggested to the investor if a new dealership is being planned to be opened.

- An exact dealership will be suggested to the investor if an existing dealership is being planned to be closed or contract to be cancelled.
- Ease of use of the colored map will provide a good user experience.

2.2 Non-Functional Requirements

- User interface and ease of use is important in order to prevent confusion of the users because DAOS is willing to reach any kind of user from dealership owner to highly educated executives of investor company.
- DAOS will make critical suggestions to investors, which means that DAOS should be a reliable assistance.
- DAOS will be a dynamic platform that should be in a continual change in order to reach the most updated data.
- DAOS should be precise and available any time investors need suggestions or want to follow their existing investments.
- Investors and dealerships data should be secured.

3. References

[1] "Code of Ethics | National Society of Professional Engineers", Nspe.org, 2017. [Online]. Available: <https://www.nspe.org/resources/ethics/code-ethics>. [Accessed: 07- Oct- 2017].