



Bilkent University

Department of Computer Engineering

Senior Design Project

Project short-name: AutAware

Project Specification Report

Erdem Adaçal, Hüseyin Emre Başar, Emre Gürçay, Çağatay Küpeli, Alper Mehmet Özdemir

Supervisor: Özgür Ulusoy

Innovation Expert: Deniz Katırcıoğlu Öztürk

Jury Members: Selim Aksoy and Halil Altay Güvenir

Progress Report

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1.Introduction	2
1.1 Description	3
1.2 Constraints	4
1.2.1 Implementation Constraints	4
1.2.2 Economic Constraints	5
1.2.3 Ethical Constraints	5
1.2.4 Sustainability Constraints	6
1.2.5 Social Constraints	6
1.3 Professional & Ethical Issues	6
2. Requirements	7
2.1 Functional Requirements	7
2.1.1 Information Management	7
2.1.2 User Network	7
2.1.3 Donation	8
2.1.4 Advertising	8
2.2 Nonfunctional Requirements	8
2.2.1 Usability	8
2.2.2 Reliability	8
2.2.3 Security	8
2.2.4 Scalability	9
2.2.5 Performance	9
2.2.6 Supportability	9
3. References	10

1.Introduction

Autism is a complex neurobehavioral condition that affects social interaction, development language and communication skills [1]. However, it has a wide range of different symptoms and effects on individuals. Depending on the impairment levels individuals may have a normal life otherwise they may a devastating disability that may require and institutional care.

Autism do not only affect the individuals also their families are affected by this complex neurobehavioral condition. In Turkey it is believed that there are 1.5 million individuals with autism. If we also include families, autism affects 4.5 million people in Turkey [2].

Parents of children with autism are in need of reaching communities for their unique situations. In recent researches it was found that giving parents opportunities to express their likes and dislikes about support networks can lead to identifying how support networks can be more effective and accessible to parents and families [3]. However, in Turkey it is not possible to find much information about autism.

In the website of Autism Foundation in Turkey it was shown that 83 centers exist in Turkey where people with autism can go get help from professionals [4]. Nevertheless, it is not possible to find information about most of those centers. Many of them have no website or blog where people can see their information. For a disorder in which special care and education is very important this creates a huge problem for the families. Researchers conclude that most of the families in Turkey have problem with reaching information about autism and those centers [5]. Also parents are in need of support groups to share their stories with other families and form a solidarity.

Many families in Turkey do not send their children to autism centers and get special care just because of insufficient information. For such a complex neurobehavioral condition not getting special care may have some serious effects on those children.

Idea of AutAware aims to solve all of the problems described above with one platform.

Following sections of this report include the detailed description of this project and an explanation of its constraints, professional and ethical issues, functional and nonfunctional requirements.

1.1 Description

AutAware is a platform where families with autistic relatives can reach the latest information about autism centers, communicate with other people, form a solidarity and help people who are in need.

The idea of AutAware comes from the fact that there are many autism centers in Turkey and they provide no information on the web. In a world which runs on internet, not providing necessary information is a huge issue. It both affects autistic people and their families.

AutAware aims to help those people. However AutAware should not be mixed up with charity applications. They are about making donations, not providing information. It is true that economy may be a concern for families but many families also suffer from lack of information and support groups.

AutAware knows that no family is like each other they are all different, they all have different problems, but they all have one thing in common, providing the best care they can to their children. Therefore AutAware will generate content individually for each user to create the ultimate user experience. Users will find content which they might be more interested in or more relevant to their situation. To create this wonderful experience, AutAware will check many different parameters such as user's income, education level, relevance to the individual with autism, and languages which user can speak etc.

Moreover to provide a social support to those families AutAware will behave like a social platform. There are forums which users can share their stories, discuss about autism and ask for advice. Unlike any other platform, AutAware will provide a smart forum system. Depends on user's location, date and the information collected from the user, it will order the forum posts.

Social aspect of AutAware is not limited to forum feature. It allows users to create events.

1.2 Constraints

1.2.1 Implementation Constraints

- The project is aimed at two different platform as a Web-based and an Android platform in order to maximize accessibility.
- Github will be used for version control and collaboration among the project members.
- In the development part of the project some open-source libraries might be used.
- React, Maven, Spring will be used for the development of the web-based application.
- Android Studio and React Native will be used for the development of Android-based application.
- Different frameworks can be added as the project progresses.
- Object Oriented Programming approach will be followed in the design of the application.
- Some creative UX designs and tools will be analyzed and inspired designs will be indicated in the application.
- The information passed to users will be acquired using Web crawling techniques and it will be filtered using accurate keywords to avoid misinformation.
- Heatmap analysis will be integrated for visitor recording and it will be used for selecting the ad that works best for the user.
- Google Maps API will be utilized for location demonstrations.
- Google AdSense will be used for advertisement purposes. Default Google AdSense filter will be used to generate user specific ads.

- If Bilkent University does not provide a hosting service for the web-based application, the product with lowest price-performance will be used for cloud computing. Other factors such as choice of database, website load times, or uptime might affect this choice.

1.2.2 Economic Constraints

- Knowing that the current version of this project is a school project, it will be proceeded with minimum expenditure principle.
- Some frameworks/libraries and third-party tools that are used in development part might be selected paid unless there is a free of charge version.
- The Android application will not have in-app purchases and it will be completely free.
- There will be a one-time fee(25\$) to publish the application on the Android platform.[6]
- Although Google Maps API does not charge a fee for a certain number of requests in its standard usage, it may charge additional fees based on the increase of requests. [7]
- There is no free hosting service for web-based applications. There will be monthly payment depend on the choice of hosting service.

1.2.3 Ethical Constraints

- No information from users will be shared with a third party organizations.
- No information will be used to enhance the benefit of the application unless the user allows.
- Created events will be examined carefully and will be deleted immediately in case of objection.

- Knowing that health is a very sensitive issue, the ongoing and resulted treatments will be indicated with care in order not to disappoint users.

1.2.4 Sustainability Constraints

- As our duty is to help families, their feedback is really important for us to maintain the application. User feedbacks will be taken very seriously.
- As this is kind of social support network, application will rely on the advertisement profits and the remaining income will be donated.

1.2.5 Social Constraints

- There is chance that maybe some people try to abuse application by writing fictional stories. This will be handled by reports coming from users. These reports will be evaluated and an action will be taken accordingly.

1.3 Professional & Ethical Issues

In order to provide better and more focused content in AutAware we will store some user specific information such as income, educational background, number of children, profession and languages they speak. This will allow us to provide a better suggestion system to the users. The reason behind that is no family is like each other and they have different capabilities depending on their economical situations and educational level. In AutAware we aim to provide the best content that the user might be interested in. So providing English content to a non-English speaker makes no sense. Also showing baby product related ads to a family with a teenager makes no sense as well. Therefore, it is essential to collect that information and show the whole potential of the application. Also user location will be collected as

the user uses AutAware. However, this might cause some concerns about information privacy security layer will be build in the application in order to solve this problem. All the data we collect will be stored in the cloud. Thus the application makes sure that the user data will not be shared with third party organizations.

2. Requirements

2.1 Functional Requirements

2.1.1 Information Management

- Users should be able to find and get information about nearby autism centers depending on their economic situation and language preferences.
- Users should be able to search for articles about autism depending on their language preferences.
- Users should be able to see news about autism depending on their language preferences.
- Users should be able to see the comments of other users about autism centers.
- Autism centers should be able enter their informations.

2.1.2 User Network

- Users should be able to register to the system successfully after providing necessary information.
- Users should be able to update their user informations.
- Users should be able to connect with each other if both users agree.
- Users should be able to share their story on the platform.
- Users should be able to see the stories which are relevant to them.

- Users and centers should be able to create common events.
- Users should be able to see the details of events such as location, description and quota.
- Users should be able to enroll to the events.
- Users should get recommendations about nearby places to socialize their child.

2.1.3 Donation

- Advertising revenues will be donated to users in need.

2.1.4 Advertising

- Users should be able to see the advertisements which are relevant to them.

2.2 Nonfunctional Requirements

2.2.1 Usability

- The application needs to have a user friendly interface that can be easily understood and used by people of different education levels.
- The application needs to be freely accessible on Google Play Store for android devices and on the Google Chrome web browser.

2.2.2 Reliability

- The application needs to be stable and avoid any interruptions/crashes.

2.2.3 Security

- The application needs to secure user information from any possible threats.

2.2.4 Scalability

- The application needs to have databases that can scale effectively for potential user growth.

2.2.5 Performance

- The application should effectively crawl the web looking for autism related news and articles in fixed intervals of time.
- The choice of database should be optimized so that users can quickly and easily look for past articles.
- Load time of the web-based application should be low.
- Uptime of the web-based application should be high.

2.2.6 Supportability

- There will a user study after each iteration of the project to improve usability of the application.

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