Bilkent University
Department of Computer Engineering

Senior Design Project

Project Specifications Report

E-psikon

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1.Introduction

According to Psychology Today, mental illnesses are substantially higher than they were in 1990s. Although mental illnesses are terrifically common in society, it can take people more than ten years to accept their mental situation and the factors that are leading them to these such as stress, anxiety, and depression and to get the help they need. Beyond that, more than 60% don't have access to effective solutions due to the reasons like inadequate education and lack of money and time [1].

There exists many examples of psychology software addressing this problem such as meditation applications and mental situation monitoring applications. Although some of these software applications are widely used and considered to be helpful by authorities, they are lack of some simple features. First major problem of these applications is insufficient personalization. They are using predefined models for each user without taking their differences into consideration or their personalization techniques are too narrow to determine those differences in an efficient manner. Second major problem is their complex user interface. They include technical terms that may not be understood by average people. Their user interface is mostly complex and not encouraging. Therefore, there are no reasons enough to make people use them on a daily basis.

Alternatively, we propose E-psikon as a mental monitoring application which is user-friendly and well-personalized.

1.1 Description

E-psikon will be a Turkish platform where the users have the opportunity to expand their self-awareness and improve their quality of life. It is a psychology monitoring application including many extra features.

E-psikon is going to try to catch patterns and try to determine what makes the user feel or think this way. It will generate several infographics according to the data coming from user such as personality types, mood infographics. These infographics is going to vary from mood graphics to the graphics related to their activity during the day. There will be a smart task manager allowing users to set weekly and monthly goals such as reading a book, going to the gym etc. and it will give recommendations about what should they do at that day according to their mental situation data. For example, if a user is observed to have concentration problems on that day, E-psikon is going to recommend 'going to the gym' option over 'reading a book' option.

Information retrieval stage is going to include three steps. Firstly, a personality test (Jung personality type test) will be applied to each user for once after they create an account. Second

and third steps are going to require frequent contribution from the user. In the second step, the application asks some simple multiple choice questions to the user about his daily activities, emotions and physical well-being. In the third step, application asks 1 to 3 open-ended questions to the user according to the answers given in step two. User is expected to give short answers to these questions on a daily basis.

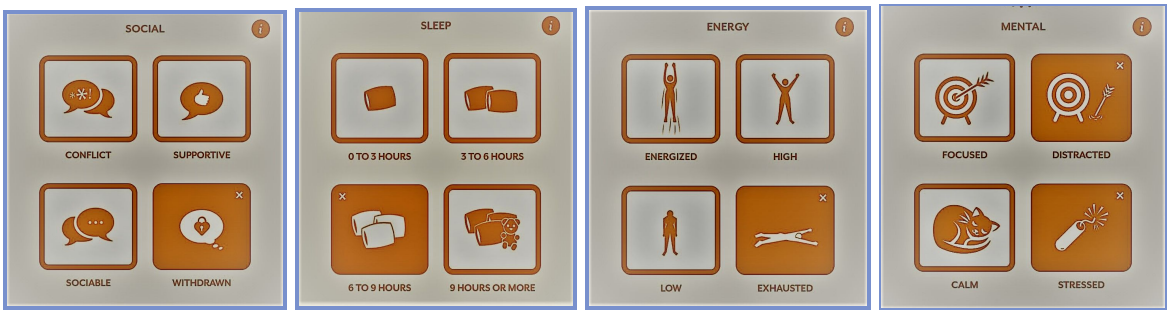

Figure 1. Example multiple choice question schema from Clue (menstrual cycle monitoring app)[2]

The answers coming from information retrieval stage are going to be analyzed via sentiment analysis techniques in the analysis stage. Several psychological approaches and techniques (Cognitive behavioral psychology, GROW coaching, strength-based counselling etc.) will be used to generate infographics. These infographics will include results of emotional situation/factor analysis, concentration and consistency analysis etc.

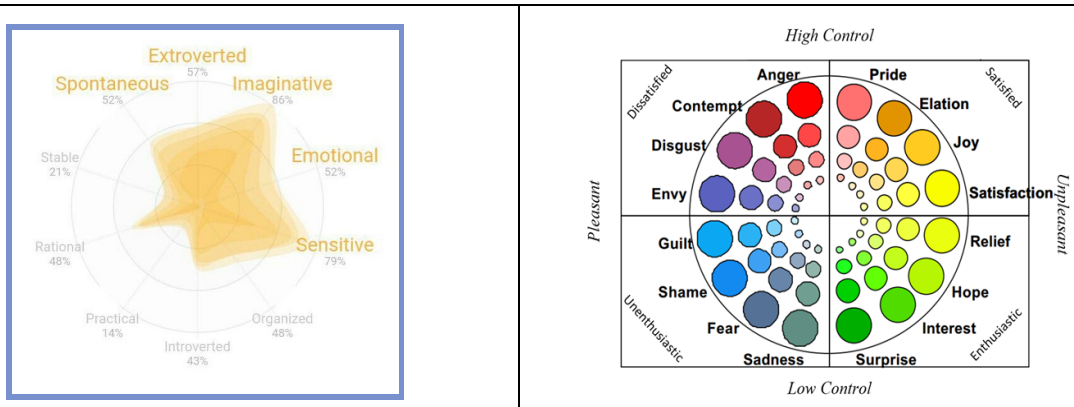

Figure 2. Examples of infographics[3]

The main target audience is the people suffering from psychological problems and psychologists/psychiatrists in a roundabout way. Daily information about mental situation of a person is a gem to trace psychological disorders. Often psychologists and psychiatrists asks user to keep a journal of their mood, E-psikon enables users to that in an easy and fashionable manner.

Minor target audiences are the employers and the regular people trying to discover their inner abilities, weak and strong attributes. Employers may observe their employees' well-being in the team or in the position they have been via E-psikon. Regular people can discover the factors that are making them happy, sad, angry etc. and get help from our smart task manager to organize their tasks and achieve their goals.

1.2 Constraints

E-psikon has a bunch of constraints that needs to be addressed. E-psikon will be a psychology related application that users will interact on a personal basis, and it will deal with sensitive information which can be highly controversial in our society. Therefore, it is important to address those constraints on E-psikon to ensure that the users will have a good experience with E-psikon.

1.2.1 Technological & Implementation Constraints

- Platform:
    - Mobile Application: E-psikon will be a mobile application for Android smartphones and tablets.
- Uptime: The application will work 24/7.
- Backups, reliability
- Dataset we are going to use is going to be created and processed by the team and it will be based on other datasets such as Emotions Sensor Data Set.
- System requires internet connection to get data from different sources and be synced up with database.

1.2.2 Economic Constraints

- Server: A rented server will be required to handle our system. The key points that we need to check are bandwidth, storage capacity, latency and processing power. Considering all those points, we will determine how many and which servers we are going to rent.
- Domain name: A domain name must be reserved to ensure that our product is easily accessible. For now, we will be using Wordpress's free services.
- 3rd party API's: The Open Source API's are going to be favored but we might need to pay for one if we see it as a more suitable option for our project.
- Marketing: To ensure that our product is well-known by the people, we will need marketing techniques especially on the Internet.
- Counselling: We may need paid counselling services from a psychology professional or organisation in order to be more accurate in our analysis.

1.2.3 Sustainability Constraints

- E-psikon should be updated periodically in order to fix the bugs and improve the existing system.
- Any users' feedback or recommendation will be appreciated since they will be evaluated and then used to improve E-psikon.

1.2.4 Social Constraints

- E-psikon requires sentiment analysis which may lead E-psikon to find ambiguous results due to the language's nature. We plan to solve this problem as it occurs during further stages.
- E-psikon requires users to enter data frequently. We must encourage users via functionalities and user interface.
- E-psikon must convince users about their data's security.

1.2.5 Security & Ethical Constraints

- Personal and account related information of the users will not be shared with any third parties. Both user and third party policies and agreements are going to be clear about this issue.
- An encryption technique will be applied to the system to preserve user data in the system.

1.2.6 Time Constraints

- E-psikon will be implemented, tested and ready to launch till May 2019.

1.3 Professional and Ethical Issues

1.3.1 Professional Issues

- A group meeting will be set every week. The number of meetings might be increased to accomplish our weekly goals.
- Workload of E-psikon will be shared equally among the team members.
- Team members will help each other and collaborate.
- A private Github repository will contain the source code of E-psikon.
- Each member has equal right during the decision making process.

1.3.2 Ethical Issues

- Personal data will be collected if the user agrees to the Terms and Conditions.

- E-psikon will be designed to minimize the use of user's personal data. We will only collect and process data for the purposes that will be previously outlined.
- We do not retain sensitive data in an identifiable format for longer than necessary to deliver our services.
- The data the users track in E-psikon about your mental situation and activities is considered sensitive personal data. E-psikon will not store sensitive personal data without the users' explicit permission. It is only when they give us explicit consent by creating a E-psikon account that we start storing sensitive data on our secured servers, alongside the personal data necessary to create an account.

2. Requirements

2.1 Functional Requirements

- Users are able to create accounts.
- Users are able to log in and log out of the application by using their accounts.
- Users can take a personality test after creating their accounts.
- Users can answer multiple choice questions.
- Users can answer open ended questions.
- Users can see their personality types.
- Users are able to see their past data statistics and infographics.
- Users are able to set and cancel weekly and monthly goals.
- Users can display the recommendations related to their daily task.
- Users can change their personal information whenever they want.

2.2 Non-Functional Requirements

- System
    - E-psikon will be an Android application
    - The application requires Internet connection to work
    - A smooth, minimalistic and fast user interface will be designed.
- Reliability
    - System must protect user information and sensitive data in an encrypted form.
    - System must authenticate users before any further action.

- Precision
    - The system should record the information of all the changes in detail.

- Usability
    - Users can provide text input in Turkish.

- Performance
    - The system should not take more than 5 seconds to log in.
    - In the latest devices, the application should not take more than 15 seconds to get ready after the user clicks on the app icon.
- Extensibility
    - E-psikon should allow adding new functionalities, features, components and so forth.
    - The system should be kept up to date.
- Availability
    - E-psikon will be available 24/7 for the users.
- Scalability
    - E-psikon will support large number of users.

3. References

1. https://www.psychologytoday.com/us/blog/our-changing-culture/201510/are-mental-health-issues-the-rise
2. https://helloclue.com/
3. https://www.myersbriggs.org/my-mbti-personality-type/mbti-basics/home.htm?bhcp=1