

Lab 1 - Not E-lone Product Description

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1. Introduction

According to the American Psychological Association, “anxiety is characterized by worried and intrusive thoughts and tension but also triggers physical changes, including sweating, a rapid heartbeat, dizziness, and an increase in blood pressure.” Anxiety is the mind and body's reaction to stressful, dangerous, or unfamiliar situations.

A prolonged sense of sadness and loss of interest are symptoms of depression, a mood illness. In the United States, depression is thought to affect 17.3 million people, of which 7.3% are adults. The Anxiety and Depression Association of America estimates that there are 40 million American adults who experience anxiety. Anxiety and depression coexist. About 3.4% of the US population overall experience anxiety and desperation disorders. Young adults are more prone to developing anxiety and depression today than they were in their previous generation.

It's crucial to realize, though, that the transition from childhood to maturity can occasionally lead to fluttering. Sometimes, anxiety or depression may not stay for a long time and pass when the young adult finds their center in the new experiences that are part of their route. It's crucial for people who are experiencing anxiety or depression to pay attention to how long their symptoms last.

Adults experience at least five of the nine primary depressive symptoms daily for at least two weeks. Anxiety might sometimes take a while for some people to recover from it. At least six months of extreme, uncontrollable concern that young adults experience.

Anxiety problems are frequently ignored and undertreated in older persons, much like depression. Anxiety can make an older adult's physical health worse, make it harder for them to carry out daily tasks, and make them feel less happy. Adults who struggle with anxiety sometimes feel alone and fear being judged for their actions. They worry that others will think

poorly of them for what they do, which occasionally prevents them from completing their daily tasks. They tend to isolate themselves from the crowd. These people could believe that no one values them and feel unworthy as a result.

Each year, serious mental illness harms the US economy worth about \$190 billion. Both in the US and around the world, mental illness is incredibly common. It has an impact on society as a whole in addition to individual patients. According to the Psychiatric Services, the costs of mental illness are significant for both people and society. The authors of "The Economic Burden of Mental Illness" calculated that the total economic expenses of mental illness were \$103.7 billion in 1985 using information from national surveys and a newly created methodology for cost calculation. Direct treatment and support costs made up \$42.5 billion of this total or 11.5% of all personal health care expenditures for all conditions. The value of lost or reduced productivity due to morbidity was \$47.4 billion. The value of lost productivity as a result of premature death brought on by mental illness was \$9.3 billion, or 5.1 percent of the total productivity losses for all deaths. The cost of caregiver services and other associated expenses totaled \$4.5 billion.

People typically get disorganized when life becomes extremely busy. Even when they only miss a day of their regular activities or chores, most people can get overwhelmed. Adults who have schedules and routines often find solace in them during difficult times. Following a timetable and routine, every day helps you develop a relationship with the issues you face and also increases self-confidence.

Young adults with mental health issues frequently struggle with knowing where to begin when it comes to participating in an activity. When a person decides to do something but then

fears being judged, anxiety sets in. They may find all of these overwhelming, and as a result, they frequently refrain from taking part in anything.

2. Not E-lone Product Description

Not E-lone is a mobile application that offers support for many forms of self-help counsel. Its objective is to mentor young adults using time management techniques, journaling, and guidance. Machine learning techniques will be used to make recommendations to users to stimulate interaction with the application. All of this will be done while utilizing sprite art and a reward system akin to those found in earlier video games. By offering them a selection of quick, simple tasks they can accomplish right away, the Not E-Lone application will provide a helping hand to young adults trapped in a cycle of anxiety or depression.

2.1 Key Product Features and Capabilities

Note-passing will serve as a form of passing encouraging messages to those who have been diagnosed with depression or anxiety. One of the worst emotions experienced by young adults who are struggling with anxiety and depression is feeling alone. They feel a sense of belonging when they can relate to someone else's situation. They are inspired to persevere since they are not alone in their struggles.

Not E-lone will provide step-by-step messages that appear to be complicated to young adults going through anxiety and depression that will help them concentrate on finishing one task at a time.

Another feature that Not E-lone will offer is Journaling. Journaling is the practice of writing down your innermost feelings, ideas, insights, and more. People who are depressed enjoy

writing, especially when they can express their emotions, thoughts, and feelings in their writing. Writing helps them feel less anxious since it allows others to see what they're going through. Journaling will assist them in establishing order when they see chaos in the outside world. By sharing their most private fears, thoughts, and feelings, they learn more about themselves. Writing helps young adults going through anxiety or depression relax on a personal level.

Setting up a schedule is crucial when addressing any type of mental disease. Having an application to streamline daily duties is a terrific idea while dealing with business, personal, and family issues. People experience these days as being too stressful. Some tasks might be so difficult that most people lack the confidence to complete them. The Not E-lone application will assist young adults to concentrate on completing a particular task one at a time rather than worrying about too many things. By focusing the young adult's attention on developing a strategy to accomplish the main objective rather than on how the chores remain incomplete, organizing a list of activities can reduce stress.

Reconceptualization is the process of adopting a new viewpoint. Another method therapists employ to help their patients is to expose them to alternative ways of thinking. Not E-lone will provide young adults with parables and analysis from different schools of thought. You can sometimes readily understand another person's point of view by placing yourself in their shoes. This concept will assist young adults in placing themselves in circumstances that will force them to consider things from that perspective.

Not E-lone will offer a First Step feature that will assist young adults in beginning a set of activities. When using the First Step feature, young adults will be encouraged to begin their daily activities by moving forward incrementally. Young adults who find it difficult to finish difficult challenges will be provided with a step-by-step template. With the aid of that template,

they will be able to focus on one task at a time. This feature will also display a list of accomplishments for young adults, which will make them feel good about themselves and motivate them to accomplish more. Furthermore, the design of this feature includes the ability to use the information provided to generate suggestions for the young adult's schedule.

2.2 Major Components (Hardware/Software)

Figure 1. Not E-lone Major Functional Components Diagram (MFCD)

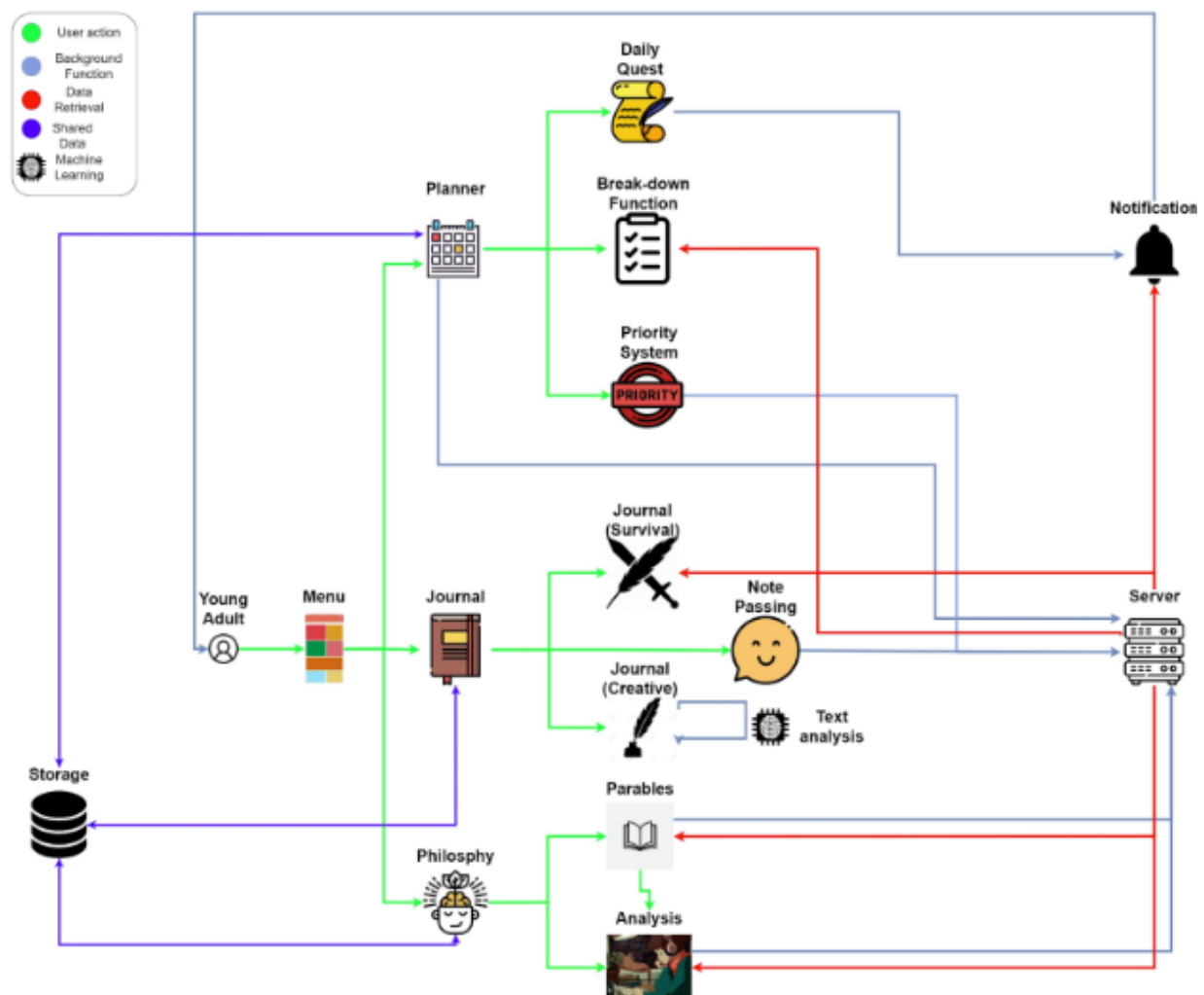


Figure 1 details the platforms' interface, processing, and storage components, as well as their interplay.

The hardware required to run the Not E-lone application will be any android mobile device.

Personal information will be saved on the Not E-lone database rather than saving data on a different database. Java programming and SQL database will comprise the software components of this application.

One of the libraries will use a collection of machine learning algorithms, such as Java-ML. Java.net* will be utilized for URL-based network communication.

Other types of third-party software, such as Gradle will be used for testing. Integrated Development Programs like Eclipse and Atom for developing applications that integrate standard developer tools into a single GUI, will also be used. Version control and software development services will be hosted on Github. The team will communicate via Discord, and the project will be managed using a trello-like system.

3. Identification of Case Study

The target audience for Not E-lone is young adults between the ages of 18 to 25. This includes the young adults' relatives, friends, and colleagues. The primary use of Not E-lone will be based on providing helpful tools to help young adults manage depression and anxiety.

For young adults, the transition from childhood to adulthood is important, especially when there is only one parent in the home. Most of the time, single parenting puts stress on both the parent and the child, which can frequently add to weariness. With the use of this tool, it will be possible to build healthy habits and practices that will ease anxiety and despair.

The application will notify and update young adults on the status of their tasks. It is essential for the application to keep young adults updated on their progress of the work. This will motivate them to work harder to achieve their goal.

There will be numerous information on the application that mental health professionals can use to their advantage. This tool is primarily intended for young adults between the ages of 18 and 25, but any adult suffering from depression can benefit from it. A single parent, for example, may experience depression when life becomes more difficult, confusing, and frightening.

Depression and anxiety are the most common obstacles for college students. College students' rates of depression and anxiety have risen significantly in recent years. Educational institutions can distribute this tool for the early detection and treatment of depression.

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4. Not E-lone Product Prototype Description

Function	RWP	Prototype
Philosophy(Reconceptualization) - Read a story		
Suggest a story to read	Yes	Partial - Suggest random story, not based on machine learning
Read a story	Yes	Full
Suggest writing prompt to complete based on story	Yes	Partial - Prompts based on story but not based on machine learning
Redirect to Journaling - Survival Mode based on choice	Yes	Full
Collect information on what parables and schools of thought are preferred by users to better recommend resources	Yes	Partial - Suggestions can be given, no machine learning
First-Step - focus on one task at a time		
Prompt young adult to write the first thing they need to do	Yes	Full
Ask young adult to mark the activity as complete once they finish	Yes	Full
Display list of completed activities	Yes	Full
Planner		
Build a schedule manually	Yes	Full
Have a schedule built automatically	Yes	Partial - Set of templates can be used to fill most of the day, no machine learning
Provide a template for faster planning	Yes	Full
Use machine learning to build templates	Yes	Partial - Machine Learning framework
Use machine learning to recommend activities	Yes	Partial - Templates can be used to fill most of the day, no machine learning
Journaling		
Write a journal entry	Yes	Full
Journaling - Survival Mode - Prompt-based		
Display a prompt above the writing area	Yes	Full
collect information on what parables and schools of thought are preferred by users to better recommend resources	Yes	Partial - Suggestions can be given, no machine learning
Journaling - Creative Mode - Free Write		
Encourage young adult to reach out to professional help if they feel they need it	Yes	Full
Encourage young adult to share what they wrote with a concerned family member or friend	Yes	Full
Ask young adult if they are feeling better or worse after writing	Yes	Full
Note-passing - Write a kind message		
Write a message	Yes	Full
Receive a message	Yes	Full
Categories of people to write messages to	Yes	Full
Word pool for writing messages	Yes	Full
Home Screen		
Provide Settings, Notifications, and Quest Menus	Yes	Full
Display active quest in banner above activities	Yes	Full
Collect information about the overall happiness of users to see the effects of Not-Elone	Yes	Full
Settings		
Allow quests to be disabled	Yes	Full
Allow notifications to be disabled	Yes	Full
Allow quests to be disabled	Yes	Full
Allow planner-related quests to be disabled	Yes	Full
Opt out of information collection altogether	Yes	Eliminated
Opt out of some information collection	Yes	Eliminated
Quests		
Encourage young adult to complete activities with family and friends in-person	Yes	Full
Encourage young adult to have family and friends create accounts	Yes	Full
Encourage young adult to sign on and complete activities daily	Yes	Full
Collect information on which daily quests receive the most feedback from users to better recommend suggestions	Yes	Partial - Suggestions can be given, no machine learning
Log-In Screen		
Verify young adult is 18 or older	Yes	Full
Ask if Not-Elone can collect information	Yes	Full
Assure young adult that any information collected will be safe and anonymous	Yes	Full
Assure young adult that any information collected will not be reported to work or school	Yes	Full
Administrative		
Create, edit, and delete accounts	Yes	Full
Social		
Send friend requests	Yes	Eliminated
Add a friend	Yes	Eliminated
Machine Learning Maintenance		
Train machine learning algorithm with data collected from young adults' feedback on parables	Yes	Eliminated
Train machine learning algorithm with data collected from young adults' feedback on writing prompts	Yes	Eliminated
Train machine learning algorithm with data collected from young adults' planners	Yes	Eliminated

Table 1. Features that will be available in the real-world product and the prototype

4.1 Prototype Architecture (Hardware/Software)

As a type of self-help counseling, Not E-lone is made to provide support to a large number of people. Any user of a mobile device with a web browser who can access the internet will be able to use the application.

The Not E-lone prototype will have access to multiple Docker containers. The virtual computer on which the Not-Elone application would run was provided by the CS department. MySQL database, one of the containers, will be used to store and retrieve account data from young adults utilizing the Not-Elone application, and Apache HTTP server, the other container to access web pages. A different database from another Docker container will be used for writing prompts, planning, notifications, and other Not-passing operations.

Not E-lone Java programs will be run in a different container by Java.net* and Java Spring Boot. All the containers will be combined into applications by Docker Compose so they can operate on a single host.

The Not E-lone application's primary coding languages will be HTML, CSS, and JavaScript. The graphical user interface will be created using these languages. While jQuery will make the JavaScript-call process easier by making it less verbose, Bootstrap will concentrate on the aesthetic of the application. Two Amazon RDS instances will be made available for the management of the two databases.

4.2 Prototype Features and Capabilities

The Not E-lone application will have graphical user interfaces for its Settings, Quests, and Notification features. These features are important since they demonstrate the application's

visual interface. For the Not-Passing, Journal, First-Step, Planner, and Reconceptualization activities, a graphical user interface will also be available.

Initial sets of parables, notifications, writing prompts, quests, and planner templates will be available for young adults through the Not-Elone Prototype.

4.3 Prototype Development Challenges

The team's lack of full stack web development knowledge and experience is a major challenge to consider during prototype development. This development necessitates the acquisition of new software and hardware.

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Glossary

Android: Mobile operating system.

Amazon Relational Database Service (RDS): Cloud-based Amazon relational database service.

Amazon Web Services (AWS): A collection of cloud-based services.

Apache HTTP Server: Web server software developed by The Apache Software Foundation.

Bootstrap: CSS framework used to develop mobile-first web applications.

Cascading Style Sheets (CSS): Style sheet language used to determine the style and presentation of a document displayed in a web browser.

Creative Mode: A gameplay mode within the journaling feature that allows the young adult to express their thoughts.

Daily Quest: An objective provided to the young adult to encourage continuous use of Not-Elone and its activities.

Database: An organized collection of data stored and accessed electronically

Docker: A set of software used to provide virtualization of applications.

Docker Container: Allows for processes to run in isolation.

Docker Compose: Allows for management of multiple Docker containers.

Depression: A mood disorder that causes a persistent feeling of sadness and loss of interest

Eclipse: an integrated development environment used in computer programming

First Step: A Not-Elone activity that allows a young adult to focus on a single goal.

Gitlab: Provides version control and repository for software development projects.

Gradle: An open-source build automation tool that is designed to be flexible enough to build almost any type of software.

GUI: Graphical user interface.

Hypertext Markup Language (HTML): Used to display documents in a web browser.

IDE: Integrated development environment.

Java: High-level object-oriented programming language

JavaScript: Programming language used to determine the way a website behaves.

Java-ML: Java Machine Learning Library

Java.net*: Java package used for communicating with networks through URLs.

Journaling: A Not-Elone activity where the young adult will be able to type their thoughts and feelings.

jQuery: JavaScript library that provides functions that simplify JavaScript operations.

Machine Learning: Artificial Intelligence designed to solve problems in a similar way to how humans solve problems.

MySQL: IDE for database coding in SQL.

Note Passing: A Not-Elone activity where the young adult is able to write a message of support to another young adult.

Notification System: A system based on preferences that push certain notifications to the mobile device

Parable: A simple story used to illustrate a moral or spiritual lesson, as told by Jesus in the Gospels

Planner: A Not-Elone activity that allows a young adult to plan their day.

Priority System: Method used to determine what events you can and can't skip out on, used both for recommendations and the user.

Reconceptualization: conceptualizing a topic in a new or different way

Spring Boot: Java framework used for backend development.

SQL: Structured Query Language, a programming language made for manipulating databases.

Stress: A feeling of emotional tension.

Survival Mode: A gameplay mode within the journaling feature that gives a writing prompt to the user.

Trello: A collaborative project management tool.

User: Young adult experiencing feelings of depression, stress, or anxiety.

User Interface: An interface that allows the user to interact with the software.

Virtual Machine: Software that provides a virtualization of a computer system.

Young Adult: A person between the ages 18 to 25

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