

MTEJ: Mood Therapy Electronic Journal (Filipino Version)

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Chapter 1: Introduction

1. Project Context

The Philippines under the state of the all-inclusive pandemic from COVID-19 has taken a toll on each individual's mood; showing vulnerability to the various emotional and mental health crisis that challenges our well-being (World Health Organization, 2022)^[1]. As a background denotation, the mood is an internal state of feeling, closely related to affect and emotions that govern a person's expressions and feelings (Williams, 2021)^[2]. It is a continuous consciousness of our state of mind that dominates emotions, and an expression of one's attitude (Merriam-Webster, 2022)^[3]. In psychological terms, the mood is a disposition of one's long-lasting emotion that lasts for hours and days, while an emotion may only last for a short-term minute. It is a general diffused feeling with no identifiable object to reflect on. (Schrader, 2018)^[4]

Statistics show that 1 in 10 Filipino young adults in the Philippines experience mood changes from moderate to severe depression. These are higher among the female demographics. Those who live in urban areas are more likely to have moderate to severe depressive mood symptoms and those who are less educated; than those who live in rural areas. Suicidal ideation is also associated with these young adults as a mood symptom (Puyat et al., 2021)^[5]. Due to the overwhelming mood and mental health crisis from the pandemic, thousands of Filipinos are seeking help from mental health support this January 2022 as a spike caused by the Omicron variant. (Xinhua, 2022)^[6]

Centers for Disease Control and Prevention (CDC, 2021)^[7] recognizes mental health as an important part of an individual's overall health and well-being as it is linked to how people

think, feel, and act. Achieving balance with daily activities and responsibilities in life positively contributes to a person's quality of living, relationships, and physical health. However, Felman (2020)^[8] states that mental health may also be at risk due to social and financial circumstances, biological factors, and lifestyle choices along with conditions such as stress, anxiety, and depression. According to the Department of Health (DOH, 2020)^[9], the Philippine WHO Special Initiative for Mental Health conducted amid the coronavirus disease (COVID-19) pandemic in the early parts of 2020, shows that there are at least 3.6 million Filipinos suffering from a mental, neurological, or substance abuse disorder. Despite the World Health Organization (WHO, 2021)^[10] predicting that reported feelings of fear, worriedness, and stress are normal trigger responses to the uncertainty and health risks caused by COVID-19, the pandemic had also caused triggers to mental health conditions and exacerbated existing ones among people.

To combat these mood and mental health problems, mood journaling significantly improves mental health as a way for individuals to confess their struggles, fears, and thoughts without judgment. Writing down their overwhelming emotions is a pivotal key to alleviating their problems, and finding a healthy way of expression and validation. The following are the benefits of journaling: (1) anxiety management; (2) stress reduction; (3) coping with depression; (4) prioritizing concerns and issues; (5) tracking and recognizing triggers from everyday symptoms; (6) better ways to control their mood; (7) an opportunity for self-positivity and self-esteem; and last, (8) a way to identify and to come into terms with their thoughts and feelings. These are the benefits of mood journaling that would significantly help individuals cope with their moods and improve their mental well-being. (Watson et al., 2022)^[11]

Furthermore, a design called Positive Affect Journaling (PAJ) is an expressive journaling technique that encourages individuals to write a day of positive thoughts, pluses, ups, and pros of

their life and their experiences. This is also called gratitude journaling which seeks positivity and confidence. Since mood journaling is personal, individuals may discover the causes and effects of their moods. Discovering their emotions and coping with them as a response to understanding their emotions better. The benefits of Positive Affect Journaling are the following: (1) regulation for stronger emotions; (2) empowering feelings to advocate for oneself; (3) self-affirmation; (4) recognizing dissociation for aid; and lastly, (5) enhanced communication skills with themselves. These are the benefits of mood journaling from the techniques of PAJ. Furthermore, for one to start mood journaling, the following steps are how to start journaling as a benefit to one's well-being: (1) identify emotion; (2) choose a tracking method; (3) log it every day; and lastly, (4) review them each month then try to make goals for the next month. (Reynolds, 2021)^[12]

Additionally, mood journaling is a beneficially low-cost way of improving an individual's mental health. This can be done either written, drawn, or typed; either on paper or on a computer — to record and to keep track of one's personal thoughts, feelings, insights, emotions, and more. It helps reduce anxiety — diminishes mental distress; It helps with brooding — a cycle of constantly thinking over a certain event that happened; It establishes awareness — turning one's experiences into structure, forming new perceptions and points of view about certain events; It regulates emotions — those who wrote about their mood and feelings has significantly shown signs of better control over their emotions; It encourages oneself to open up — to gain social support from others that helps with emotional healing through shared experienced; It can swiftly speed up physical healing — since mental distress causes physical pain, journaling can heal these issues faster. These are the benefits of mood journaling as medically reviewed and written by a medical doctor. (Brennan, 2021)^[13]

In addition, limited studies have shown evidence that mood tracker applications have been helping young individuals cope with their mental health. Various studies with a participation rate of 30% to 99% showed the methodological factors and individual characteristics caused by mood monitoring applications. The results suggest that these applications indeed reduce depressive symptoms of youth by increasing their emotional awareness and managing their mental health and substance problems. Although limited, these studies still conclude that mood-monitoring applications for the youth is a promising way to combat negative mental health issues of young individuals. (Dubad et al., 2017)^[14]

In terms of medical use, nine recent systematic reviews and studies show that mood monitoring helps alleviate depressive, and bipolar disorders for an effective long-term treatment in medical use. Research has substantially proven that patients with mental illness who use telemonitoring and mobile technology have been able to help assess and monitor their mood states. It helps understand patient perspective, balance self-monitoring, patient empowerment, and distant patient support involvement. The results of these studies were found effective and successful in improving depression scores; but not in terms of manic episodes of these patients. In conclusion, mood monitoring applications provide acceptable support for medical use in aiding patients with mental illnesses. A feasible and useful intervention for patients with a diverse background of ethnicity and age that aids them with the management of their bipolar and depressive symptoms. (Watt et al., 2020)^[15]

In similar technologies, the Philippine Department of Health (DOH) and the United States Agency for International Development (USAID) have developed the Philippines' first mobile application for mental health and self-care, called "Lusog-Isip", released last October 15, 2021. This similar technology seeks to help those with mental health problems as an

evidence-based tool and intervention as a growing need during the COVID-19 pandemic. The DOH has stated that this development is a “timely innovation” due to the aforementioned pandemic. The features of this application include recommendations of ways to help users improve their mental health through (1) workbooks; (2) exercises; (3) audio guides; (4) journaling; (5) mood tracking; and (6) self-care reminders. (United States Agency for International Development, 2021)^[16]

Although the “Lusog-Isip” application contains journaling and mood tracking similar to MTEJ, a clear definitive distinct feature that MTEJ possesses is its therapeutic mood diary feature that contains scaling mood options for depressive and elevated mood levels, whereas the “Lusog-Isip” application only has limited options with only “Joy, Sadness, Anger, Fear, and Disgust” as its mood. Moreover, in the case of journaling, the MTEJ is specifically designed as a therapeutic journaling system having the “Automatic Thought Journal” feature that systematically asks users about their thoughts guided by certain questions, whereas the “Lusog Isip” application is a free-form journal designed to spontaneously. (DOH - KMTS, 2021)^[17]

The mood levels in the country had drastically changed due to the pandemic, affecting thousands of individuals, and causing moderate-to-severe depressive symptoms, anxiety, and stress levels (Tee et al., 2020)^[18]. This should serve as one of the priorities for the country to develop and improve mood and mental health support for the advancement of the country, alleviating these problems. As a result, investing in technologies that improve mood levels such as the MTEJ could be a vital way to address the growing issues of mental health in the country.

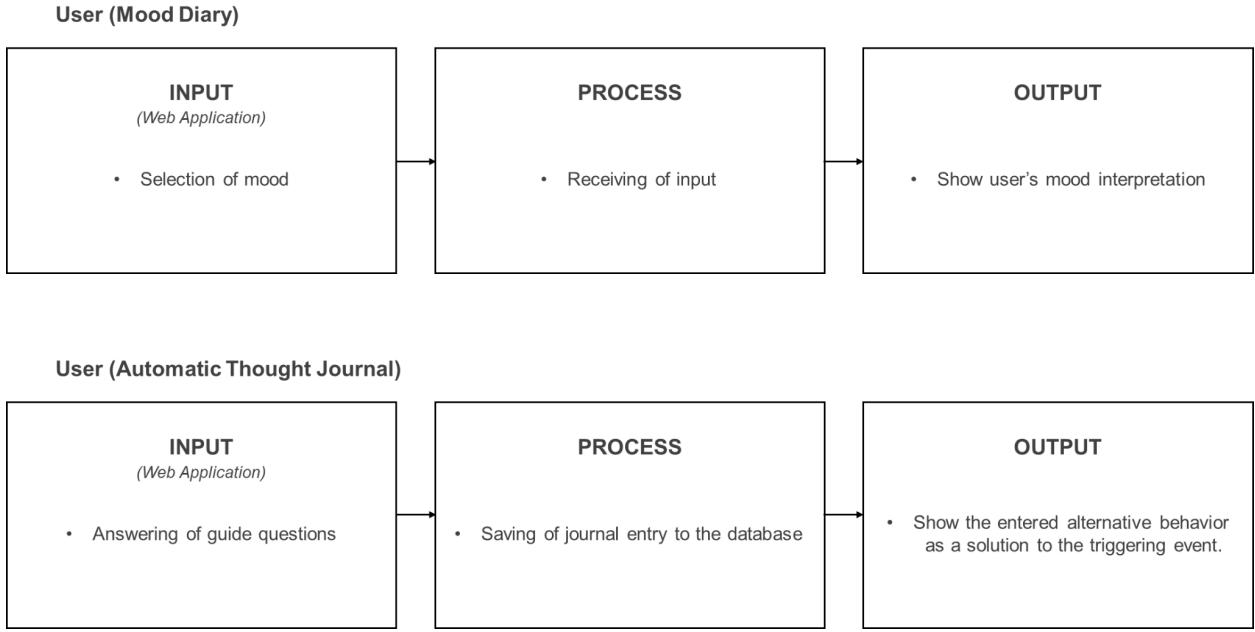


Figure 1.1 Input-Process-Output Diagram

The diagram shown in Figure 1.1 is an input-process-output showing the two major functionalities of the MTEJ system. The first one is the Mood Diary functionality — a mood monitoring diary specially designed as a therapeutic feature for users, allowing them to select various levels of mood, from ‘Severe Elevated’ to ‘Normal’ to ‘Severe Depressed’. The second major functionality is the Automatic Thought Journal containing guide questions for users, allowing users to manage their mood interpretation and how to solve these triggering behaviors. These are the roles of the users in the two major functionalities of MTEJ.

2. Purpose and Description

The purpose of this project is to develop a web application that will reduce the friction and effort in the tracking of moods of a person and thoroughly guide the user in processing his or her emotions through using a therapy called “Automatic Thought Journal”. Correspondingly, this web application could help the user see his or her overall mood swings throughout the day.

Instead of using bullet journals or Microsoft Excel to track the person's mood, it is now available in a web application that will also interpret the person's overall mood at the end of that day. In addition, the Automatic Thought Journal will help the user to input his or her automatic negative thought and process his or her emotions and thoughts through guided questions. Uniquely, since the information of the user, moods, and Automatic Thought Journal entries are arranged in a good manner, this information may be used to better understand the way the user thinks and how the user processes emotions. Moreover, this information may be helpful as a future reference when a user consults a professional.

The web application's default language shall be set to the Filipino language to allow more Filipinos in making use of the application, most especially for individuals having difficulties in understanding the English language. Correspondingly, this application will allow the user to create his or her personal account and he or she must fill out his or her personal information. Once the user is done, the user may now choose whether he or she is currently depressed, elevated, or feeling normal. The user may also choose whether he or she is currently feeling mildly depressed, moderately depressed, or severely depressed. On the other hand, the user may also choose whether he or she is currently feeling mildly elevated, moderately elevated, or severely elevated. At the end of the day, the web application will interpret the overall mood of the user and will report it to the user at night time. Additionally, this web application will allow the user to learn some therapy techniques that he or she can use whenever his or her emotions are out of control. Furthermore, if, for instance, the user has a negative thought, the user may input the triggering event and the web application will ask for the user's automatic thought, automatic feeling, resulting behavior, and manifestation with guided questions. After that, the web application will now ask the user for his or her alternative thought, alternative feeling, and

alternative behavior with guided questions. This therapy session will be saved in the database and the user can use it as a reference when he or she decides to consult with a professional.

The web application will be developed using HTML, CSS, SASS, Bootstrap, JavaScript, and Firebase Database and will be tested in different kinds of browsers such as Google Chrome, Microsoft Edge, Mozilla Firefox, etc. to know the capabilities of the web application.

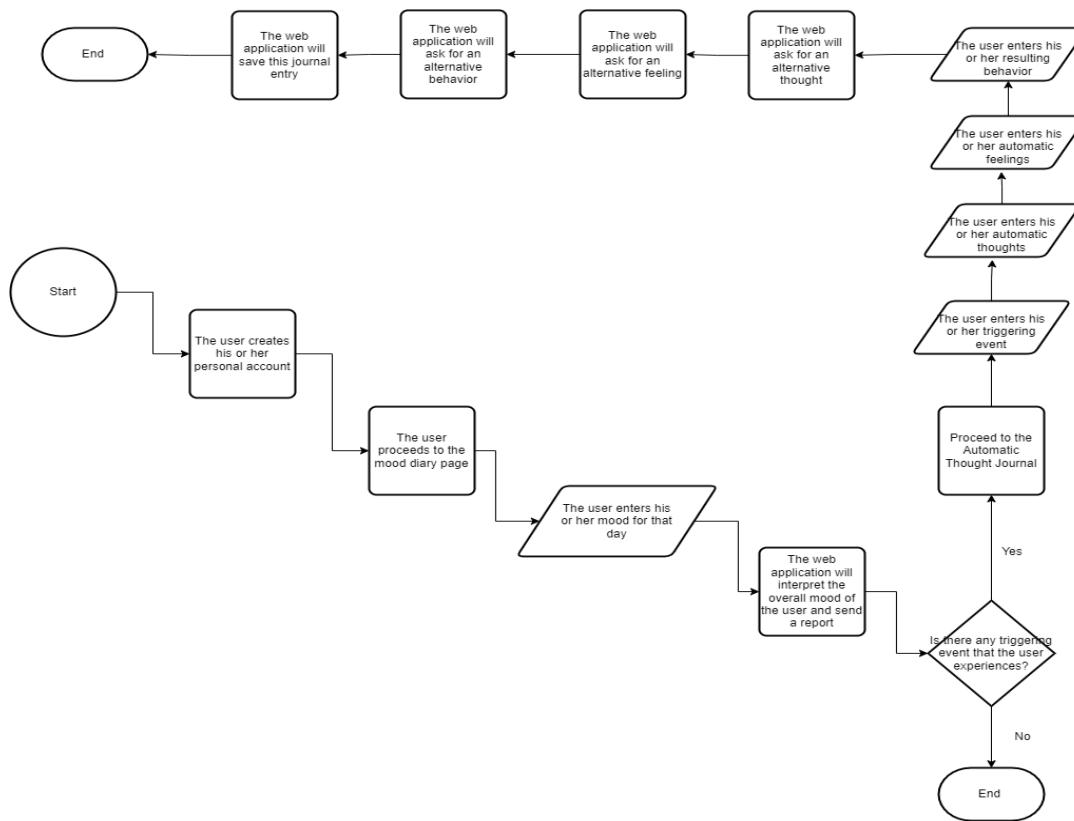


Figure 1.2 Project process flow chart

The flow chart shown in Figure 1.2 illustrates the flow and process of the web application. As seen in the figure, the web application starts by allowing the user to create his or her personal account. After that, the user may proceed to the mood diary to choose whether he or she is feeling depressed or elevated and to what level of depression and elevation he or she

experiences. Uniquely, the web application will interpret the overall mood of the user and will report it at the end of the day. After that, the web application will ask the user if he or she has negative thoughts at the moment. If, for instance, the user chooses ‘yes’ - meaning, the user experiences having negative thoughts, thereby he or she may proceed to the Automatic Thought Journal. In the Automatic Thought Journal, he or she must enter the triggering event, his or her automatic thoughts, automatic feelings, and his or her resulting behavior. After entering this information, the web application will ask the user for his or her alternative thought, alternative feeling, and alternative behavior and the web application will save this entry to the database. On the other hand, if the user chooses ‘no’ - meaning, the user is not currently experiencing negative thoughts, thereby the process of the web application may end.

Because of the features that the web application has, this project will greatly benefit the following:

Students: They will greatly benefit from this web application because emotions and the ability to learn are interconnected. In research from Ruiz et al. (n.d.)^[19], having the emotional stability of students proved to be essential in learning. With this fact, our web application can help students to track their moods and receive instant feedback about their overall mood for that day so that they can assess what’s wrong with their emotional and thought management. Additionally, this regular self-reflection from using the Automatic Thought Journal will allow the students to know the relationship between their thoughts, feelings, and actions, thus allowing them to achieve high performance in school.

People with mental disorders: According to Behavioral Health Care Ascension Seton (2017)^[20], having a mood diary will greatly help in supporting your mental health. Additionally,

according to this article, there are three ways a mood diary can support mental health. First, a mood diary can identify signs of Bipolar Disorder. Keeping a mood diary can help predict the rapid changes in the mood of a person and may help in preventing a bipolar episode before it starts. In addition, the person can comment on his or her sleeping patterns, changes in diet, anxiety level, and stressors. Second, a mood diary allows the person to maintain healthy habits. Keeping a mood diary helps the person to keep accountable for himself or herself and it will help the person track his or her thoughts, feelings, actions, and challenges daily, which may help in preventing behaviors that can trigger a bipolar episode. Lastly, keeping a mood diary can be used as a reference when a person decides to consult a professional. A mood diary and an Automatic Thought Journal can enlighten the professional about what may trigger the person to be depressed or extremely elevated (manic). Knowing the accurate triggers may help the professional to offer the right interventions and therapy techniques to the person with a mental disorder.

Future researchers: This study could serve as a piece of additional information for those who want to use this to replicate or conduct a further study of this topic using a different therapy intervention and technique. Enhancement of the use of different therapeutic interventions and techniques is recommended to further reinforce the results of this study.

3. Objectives

The MTEJ: Mood Therapy Electronic Journal has the following objectives:

a. General Objective

- To help users maintain, stabilize, track, monitor, and improve their mood and their mental well-being and health through mood monitoring and a therapeutic journaling system.

b. Specific Objectives

- To recognize users' mood patterns for internal and external emotional triggers, thereby learning ways on how to better control them.
- To perceive and make an insight of how users can better take care of themselves, manage anxiety, reduce stress, and cope with depression.
- To create a safe space for users to unconditionally express their emotions, thereby helping them provide an opportunity for self-talk and identify thoughts and behaviors.
- To allow prioritization of users' mental health including their emotional, psychological, and social well-being.

4. Assumptions, Scope, and Limitations

a. Assumptions

- The users of the system have access to Internet connectivity and power supply.
- Users of the application must have their own personal computer or a laptop device with an installed browser.
- Users of the application must have their own personal mobile device with an installed browser.
- The application shall strictly comply with the standards of the Data Privacy Act of the Philippines (RA 10173) to ensure the privacy of its users.
- The actors of the system must have a registered email account (such as Gmail) in order to fully sign-up and register to MTEJ.
- Inputted data should be based on the individual's mood and thoughts for the day.
- The web application will be accessible on both desktops and mobile phones through web browsers.

b. Scope

- The project will be developed using HTML, CSS, SASS, Bootstrap, JavaScript, and Firebase Database. Correspondingly, the web application will use the following therapy interventions:

1. Mood Diary

- a. This therapy intervention will allow the user to enter his or her mood for that day.
- b. This mood diary will allow the user to view his or her mood interpretation at the end of the day.

2. Automatic Thought Journal

- a. This therapy intervention will allow the user to enter his or her triggering event, automatic thoughts, automatic feelings, and resulting behavior.
 - b. This therapy intervention will ask the user for his or her alternative thought, alternative feeling, and alternative behavior.
 - c. After collecting the information, the web application will save the entry to the database.
- The application is catered majorily to Filipinos. Hence, the language is Tagalog.
 - The web application will also have enough therapy techniques and strategies that the user can refer to whenever their emotions are out of control.

c. Limitations

- The web application will not be used to clinically diagnose mental illnesses. It is solely for monitoring and tracking the user's mood patterns and emotional triggers.
- The system may only be accessible whenever an Internet connection is available.
- To comply with the International Age Rating Coalition (IARC) for applications, MTEJ may be used by individuals aged 12 years and older.
- As of now, the web application will only be tested in Google Chrome, Microsoft Edge, and Mozilla Firefox.
- There will be no direct involvement of professional experts in the web application; such as features that allow communication between the user and professional expert.
- The default language for the application will only make use of the Filipino language.
- As of now, the application will not have a feature to customize, edit, and personalize users' account details.
- Firebase Database has limitations on its deletion of data. It does not fully delete its data collections and subcollection when used outside of its online console. The following are excerpt documentation from Google's Firebase Database (2022)^[132]:
 - Deleting outside console does not fully delete the data:

- “*When you delete a document, Cloud Firestore does not automatically delete the documents within its subcollections. You can still access the subcollection documents by reference.*”
- Deleting data from a mobile/web client is not recommended:
 - “*While it is possible to delete a collection from a mobile/web client, doing so has negative security and performance implications. Deleting collections from a Web client is not recommended.*”
- Deleting data is recommended on Google’s Firebase console only:
 - “*You can delete documents and collections from the Cloud Firestore page in the console. Deleting a document from the console deletes all of the nested data in that document, including any subcollections.*”

Chapter 2: Review of Related Literature, Studies, and Systems

1. Review of Related Literature

a. History of Mood

Etymological records for the use of “mood” can be dated back from the 1st millennium before the 900s, or the 8th century. It was a word derived from the Old English *mōd* meaning “mind, spirit, feeling, and courage” (Dictionary, n.d.)^[21]. Mood was also akin to the Proto-Germanic word *muot* meaning “frame of mind, disposition”. The Oxford English Dictionary (OED) has noted that mood was reinforced as an association with the Germanic sense of “mental state”, capturing a linguistic sense as a node of indicative, imperative, and optative verbs in relation to mental states. An ancestor of the word mood can also be seen as a Middle English spelling *moode* for both the modern English *mood* and *mode*. (Auwera & Aguilar, 2015)^[22]

Mood was most often used as a scientific and biological term associated with disorders. Scientifically, it originated as a health condition heavily aligned with mental disorders due to its contribution to one of the largest sources of morbidity — depression. Medical uses of mood have given a massive emphasis to its clinical problems towards mental abnormality, rather than its normality. *Proximate Mechanism*, a question pertaining to how mood is controlled in the brain has been given importance in terms of history rather than *Adaptive Function*, a question for the state of survival values of mood systems and how it regulates an individual’s behavior in its natural environment. In biological science, moods are longer-lasting than emotional states upon which triggering stimuli are detached when an animal experience repeated threats that causes integrative functions for fright or loss as an acute emotional response. Mood disorders for

animals are prolonged and severe when these experiences are invoked and spilled over. (Nettle & Bateson, 2012)^[23]

Mood in a scientific and mathematical evolutionary term is a phenomenon involving a function of integrative emotional experience. It involves organisms (such as both humans and animals) that continuously change due to the local rate of rapid change in their response to the environment, as well as their physical condition. The following is a framework for classifying moods as a response to punishment or reward: (Nettle & Bateson, 2012)^[23]

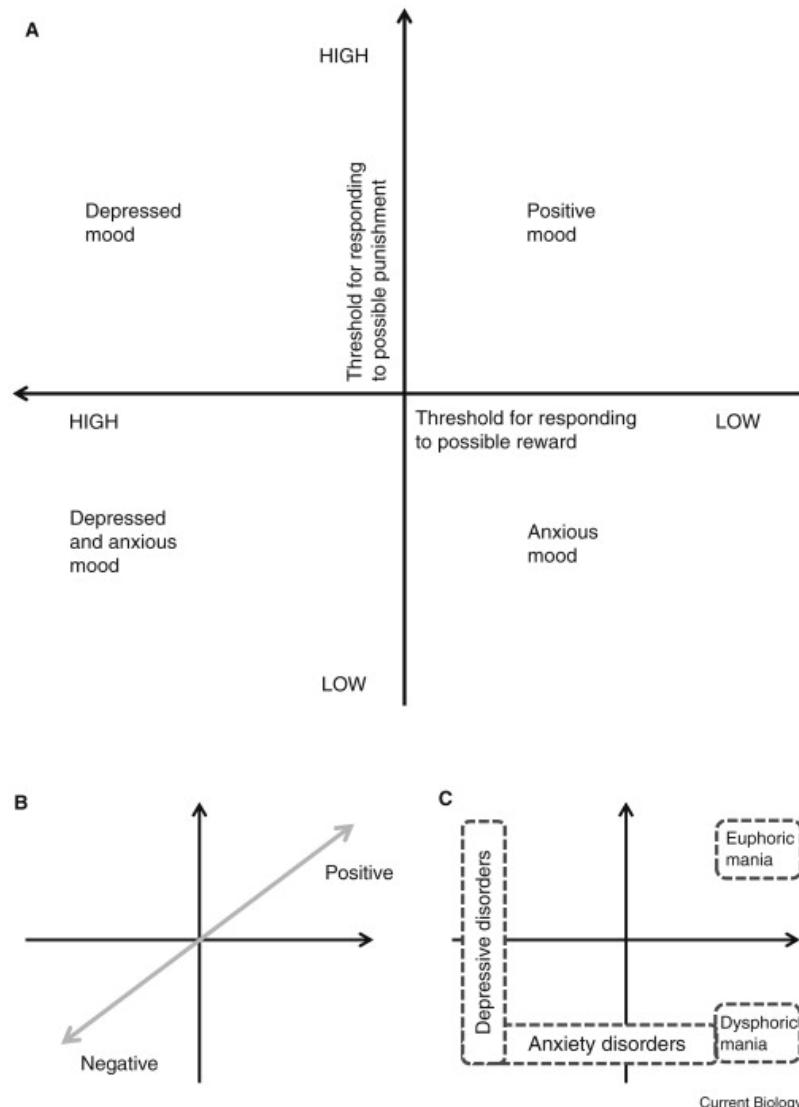


Figure 2.1.a.1: Biaxial framework for classifying moods across species.

Figure 2.1.a.1 represents the framework for a species' mood classification based on the axes. The following are the axes present in the framework: (A) represents the thresholds for rewards and punishments as an indicator of one's mood; (B) represents the valence of human mood; while (C) represents the location of human mood disorders. The vertical axis represents the cues for mood punishments. The vertical axis located at the top end represents the highest punishment, meaning an individual is experiencing anger, manic, and stress. On the opposite side of the vertical axis towards the bottom end, the low threshold for punishment indicates an individual experiencing vigilance, sleeplessness, hyperarousal, and attentional bias for threats. The horizontal axis located at the left end represents the highest reward threshold, meaning that an individual is experiencing high reward expectations that cause restlessness, unease, nervousness, and discomposure. Meanwhile, the horizontal axis located at the right end of the arrow represents the lowest reward threshold, meaning that an individual is experiencing contentment, relaxation, satisfaction, happiness, and pleasure from contentment. These axes are orthogonal to each other, meaning that an individual can have the following possible occurrences: (1) depressed and anxiety-prone; (2) anxiety-prone but not depressed; (3) depressed but not anxiety-prone; and more scenarios. (Elsevier, 2012)^[24]

Additionally, mood is often associated with emotions — which are feelings of great intensity which are heavily directed towards someone or something. Whereas, mood is a feeling of lesser intensity than emotions that are often lacking in a contextual stimulus. Emotions are mostly a fleeting reaction than mood as indicated by experts. An example of emotion would be: if a person has shown ill-mannered behavior towards another, they might feel angry for a few seconds to minutes, mostly for a short period of time. On the other hand, mood lasts for a while. For example, if a person is in a bad mood, they might feel that way for hours. (Hume, n.d.)^[25]

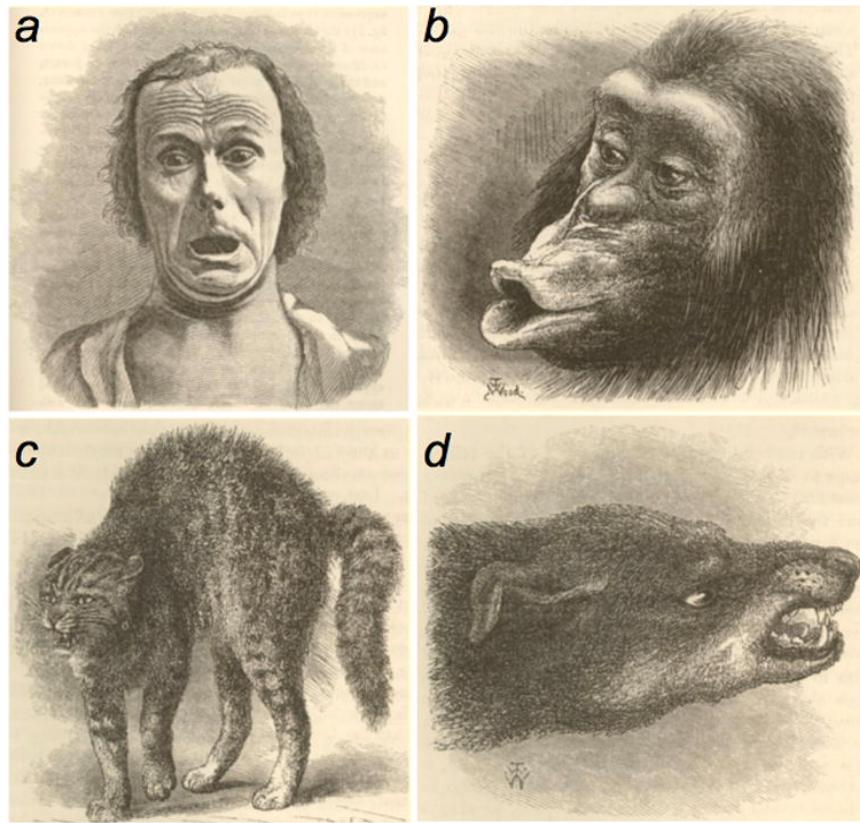


Figure 2.1.a.2 Charles Darwin's examples of emotional expressions (1872)

Figure 2.1.a.2 shows emotional expressions from Charles Darwin's (1872)^[26] *The Expression of the Emotions in Man and Animals* (1872). It shows four handdrawn pictures of emotions: (a) a human expression of terror; (b) a chimpanzee's emotion of disappointment and sulky; and a (c) cat and a (d) dog showing hostility. Darwin has stated in his book that animals are capable of expressing certain emotions such as anger, terror, jealousy, and love, much like how humans do. (Anderson & Adolphs, 2014)^[27]. This signifies clear distinction between mood and emotions — emotions are mostly a feeling towards a reaction from a contextual event, while mood is a generally background feeling based on a non-existing event with no specific causes that evaluates an overall feeling currently experienced by a person or an animal. Although used interchangeably, they are both two distinct phenomena. (Beedie, Terry, & Lane, 2005)^[28]

b. History of Major Mood Disorders

Mood disorders is an umbrella term for mood-related types of conditions. These mood disorders are commonly characterized by depression and bipolar-related disorders. Mood disorders are general in demographics, ranging from children, teens, and adults having mood-related disorders. Although present in those demographics, symptoms may vary from one another. Teens do not have the same symptoms as adults; likewise, adults do not possess the same symptoms as children. Mood disorders are harder to diagnose due to its mental scope, and patients having these symptoms do not express how they feel. Therefore, therapy and drugs such as antidepressants are key to solving these mood disorders. (The Johns Hopkins University, 2022)^[29]

The following are brief explanations of the five most common mood disorders :

1. **Major Depression** – Also known as *major depressive disorder*, is a mood disorder that continuously causes an intense feeling of sadness and loss of interest. Depression affects a person's emotional and physical health, affecting the way they think, feel, and behave which hinders their day-to-day activities. Symptoms of Major Depression includes the following: (a) feeling of sadness, tearfulness, emptiness, and hopelessness; (b) irritability, outbursts, anger towards small matters; (c) loss of interests to hobbies and activities; (d) insomnia; (e) lack of energy and tiredness; (f) weight loss or weight gain; reduce of appetite or increase in appetite; (g) anxiety or restlessness; (h) slowed thinking, and/or body movements; (i) feelings of guilt and worthlessness; (j) trouble concentrating and thinking; (k) thoughts of death, suicide, and self-harm; and (l) unexplained physical problems such as headaches and back pain. (Mayo Clinic, 2022)^[30]

2. **Dysthymia** – Also known as *persistent depressive disorder*, is a long-term chronic depressive mood disorder that usually lasts for several years. These results to a massive long-term effect on an individual — affecting their relationships, school, work, and daily activities because of productivity loss, low self-esteem, avoiding social interaction, and feeling of hopelessness. Symptoms of dysthymia involve long-term indications of: (a) sadness, (b) loss of enjoyment, (c) major weight change, (d) insomnia, (e) fatigue, (f) guilt, (g) loss of concentration, and (h) suicidal indicacies. (Bruce, 2020)^[31]
3. **Bipolar Disorder** – Formerly known as *manic-depressive illness* or *manic depression*, is a mood disorder that causes irregular shifts in mood, energy, activity levels, focus, and inability to do their daily activities. Three types of bipolar disorder are currently present: (1) Bipolar I Disorder, manic episodes that last for 7 days, or severe manic tendencies that require hospitalization; (2) Bipolar II Disorder, a less-severe pattern of depressive and manic symptoms; and (3) Cyclothymic Disorder, a long-term bipolar disorder than usually lasts for two years through periods of hypomanic symptoms. Usually, a bipolar individual has two states: (a) manic episodes and (b) depressive episodes. A manic episode symptom includes elevated happiness, feeling elated or “high,” talking fast about tons of varying topics, racing thoughts, and doing risky activities such as eating excessively, impulsive spending of money, and reckless sex. A depressive episode on the other hand has symptoms of feeling low, feeling slow, trouble sleeping, feeling like there is nothing to say, trouble focusing, and having little to no interest or pleasure in activities. (National Institute of Mental Health, 2020)^[32]

4. **Substance-induced Mood Disorder** – A mood disorder caused by intaking substances such as medications, drugs, alcohol, and cigarettes that causes changes in mood such as depression, anxiety, psychotic behavior, manic, and other clinical and mood symptoms. Ingestion of these illicit and iatrogenic substances and medications are used to alleviate mood, however, it becomes paradoxical as it causes negative mood consequences when intaking these substances. Depression and Bipolar Disorders may also be a result of substance-related mood disorders. (Revadigar & Gupta, 2021)^[34]

i. **History of Depression**

Historical records of depression can be traced back to the second millennium B.C. of ancient Mesopotamian texts, called “melancholia” during this period. Accounts as early as this time mentioned depression as a result of demonic or spiritual possession to humans, usually treated by priests rather than therapeutic therapy. In the 400 B.C., Ancient Greeks and Romans had differing views towards depression or melancholia. Civilizations at this period indicated that melancholia should be treated with exorcism, restraint, beatings, and starvation as a necessary way to cure those with the disorder. (Nemade & Patricelli, n.d.)^[35]

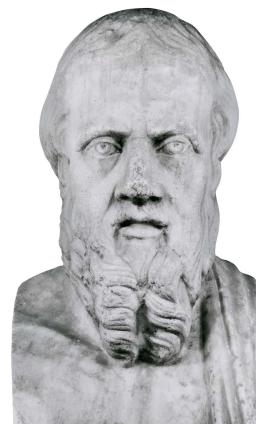


Figure 2.1.b.i.1 Greek historian Herodotus

Figure 2.1.b.i.1 shows Herodotus, a Greek historian during the 400s B.C. who significantly contributed to the narrative history of the world, writing the book “*The History of the Greco-Persian Wars*” (The Editors of Encyclopaedia Britannica, 2019)^[36]. Herodotus contributed to depression when he wrote of evil spirits possessing a king through melancholia. He indicated that civilizations who had been possessed by evil spirits are viewed as a form of demonic activity and possessions. However, early Roman and Greek doctors during this time had already believed that mental illnesses such as depression was a form of psychological disease, rather than demonic possessions. (Nemade & Patricelli, n.d.)

In the 300 B.C., cure for melancholia had also circulated and proposed through Hippocrates, a Greek physician who lived from 460-377 B.C., indicating that mood disorders were caused naturally, rather than supernaturally. As a suggestion for its cause, Hippocrates had indicated *brain pathology*, which is a form of dysfunctional brain disease which can be affected by heredity. Hippocrates was the first ancient physician who categorized these mental illnesses into three: (1) melancholia (or depression), (2) mania (or manic from bipolar disorder), and (3) phrenitis (or brain fever). These were his classifications of mental illnesses during this time, providing detailed clinical descriptions of each. (Washington State University, n.d.)^[37]

Melancholia of Antiquity has been described by Hippocrates in his book *Aphorisms* as: “If fear and sadness last a long time, such a state is melancholy.” This has proven evidence that Hippocrates is the first recorded physician who clinically diagnosed depression as a mood disorder. Furthermore, Hippocrates has founded four types of moods through his own theory of moods. (1) blood: a joyous and happy type of mood; (2) phlegmatic: a calm, relaxed, and imperturbable type of mood; (3) biliary: a mood of anger; and (4) atrabilist: a sad and sorrowful

mood. These are moods described by Hippocrates, an early take of moods during his period, often characterized by earth, air, fire, and water respectively. (Bourin, 2020)^[38]

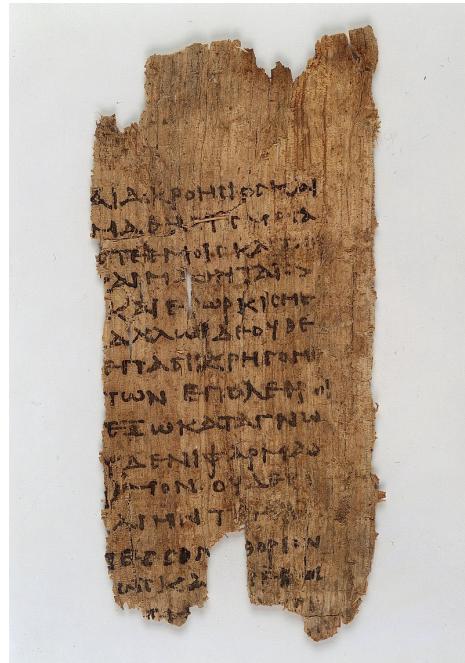


Figure 2.1.b.i.2 Hippocratic Oath

Figure 2.1.b.i.2 shows the Hippocratic Oath that governed the medical behavior of doctors and physicians for 2000 years. These ancient writings contain an oath written after the death of Hippocrates as an inspiration and to provide confidence for both medical doctors and their patients. The inspiration took place as Hippocrates wrote 60 to 70 books that governed the medical industry for centuries, which resulted in Hippocrates being given the title as “the Father of Medicine.” The Hippocratic Collection of books not only included clinical descriptions and cure for common diseases, but it also contributed to mood disorders and mental illnesses which led to early historical records and accounts of these disorders. (Darling, n.d)^[39]

In the Middle Ages (500 A.D. to 1500 A.D.), the medical and scientific efforts made by Hippocrates to diagnose melancholia (or depression) as a brain and mental disorder was rapidly reversed due to the power of the Church from the fall of the Roman Empire. Teachings from the

church and catholicism from the Roman influence had disregarded Hippocrates' previously-made efforts to diagnose melancholia. Instead, depression was once again described as a demonic influence from religious jurisdiction. As a result, the cure for melancholia became chanting, praying, touching of religious relics (cross), visiting holy sites, and spraying holy water from exorcism. (Washington State University, n.d.)

During the 14th-17th century in the Renaissance period, individuals with depression were executed and were put into trial throughout Europe as a form of public execution and punishment. Depression was also considered as a *Lunatic* behavior, and was then locked up into lunatic asylums. Although depression was revisited and reconsidered as a natural cause by doctors, these were somehow still not enough to stop the harsh treatment for individuals with the associated mood disorder. A writer during this period had written about depression as a social and psychological cause, indicating poverty, fear, and loneliness as one of the origin sources of said mood disorder. (Schimelpfening, 2020)^[40]

In the 19th century, depression was once again reconsidered as a mental illness, rather than supernatural causes. Emil Kraepelin, a German psychiatrist, referred depression back to "melancholia" as a form of depressive states. He formed two classification of depression: an external (exogenous) and internal (endogenous) depression. External depression was considered as a passing depression, such an example would be the death of a loved one (BrainsWay, n.d.)^[41]. On the other hand, internal depression became the current Major Depressive Disorder, or (MDD), caused by intense feelings of sadness, worthlessness, and more. (Schimelpfening, 2020)^[42]

ii. History of Dysthymia

Historical references of Dysthymia were first seen in ancient Greek, labeled together and discussed previously as melancholia (or depression). However, the name “Dysthymia” as a psychiatric term was first coined in 1844 by C.F. Flemming (Brieger & Marneros, 1997)^[43]. This was seen as a low-grade depression that continues to linger through an affected person that usually lasts for more than 2 years, called “Dysthymic Disorder.” Dysthymia was often coined together with Cyclothymic disorders as a subsume category of recurring depressive symptoms of mood disorder. To differentiate Dysthymia with Major Depressive Disorder (MDD), dysthymia is chronically less severe in terms of symptoms that lasts for years, while MDD is the severe counterpart of depression with critical symptoms. (Freeman, 1994)^[44]

Dysthymia has its classification significantly evolved through centuries due to it being commonly confused with depression, becoming poorly understood as a mood disorder of its own. It also has an ever-changing nature as a depressive disorder, adding a possible reason why it has an evolving classification. Due to the fact that dysthymia has been misinterpreted as depression back in history, it was considered as a depressive personality state as DSM-II. However, this was later changed in DSM-III as dysthymia has now been conceptualized as a separate disease state than a personality disorder in DSM-II. With that said, dysthymia can be classified as a mood disorder defined as a mild chronic depression that should at least last longer than 2 years. (Patel & Rose, 2021)^[45]

Currently, dysthymia is a difficult mood disorder to evaluate and detect for psychiatrists and professional medical doctors due to its multifaceted nature and varying depressive symptoms that should at least last for two years. Its causation is multifactorial with numerous underlying factors to become fully diagnosed with one. (Schramm, 2020)^[46]

iii. History of Bipolar Disorder

In 460 – 370 B.C., Hippocrates' medical records had documented the first mentioned Bipolar Disorder as one of the two extreme moods: “feeling extremely low” and “feeling extremely energized and excited.” The former is what we refer to now as Depression, while on the other hand, the latter is what is known today as the manic phase of a Bipolar person (Bhandari, 2020)^[47]. The first documented individual who indicated that Bipolar is a mood disorder related in the brain was an ancient Greek physician named Aretaeus of Cappadocia. This Greek physician was the first person who determined Bipolar disorder as a “manic-depressive” illness (Aydemir & Malhi, 2014)^[48], a reference to the modern criteria for a Bipolar person with an “elevated high” phase or manic, and the “elevated low” phase or depression. (White Swan Foundation, 2015)^[49]



Figure 2.1.b.iii.1 Jean-Pierre Falret who discovered bipolar cycles (Cadogan, 2021)^[50]

Figure 2.1.b.iii.1 shows a French psychiatrist Jean-Pierre Falret (1794 – 1870) from the 19th century — the first known individual who studied bipolar disorder intensively . His research on bipolar disorder became a defining criteria for diagnosing bipolar. As the cycle of depression and mania was considered a separate illness altogether, Falret had suggested that the cycle of inter-changing depression and mania of a person is a single condition, naming it as *maladie*

circulaire. His discovery led to the significant nosology of bipolar disorder through his dedication of studying the mood cycle of a bipolar person's highs and lows. His study included intervals of time between a person's state of depression (low) and their state of mania (high), and a possible pattern from the repetition of these cycles. (Pichot, 2004)^[51]

In the late 20th century, the American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM) conclusively first coined the mood disorder as a "bipolar" disorder to signify two opposite poles — a polar opposite for the depressive low and the manic high phase of an individual with the disorder. This was a way to avoid calling patients "maniacs" during that time (Krans, 2019)^[52]. DSM has 5 total revisions for the disorder. The following are the five revisions of APA's DSM manuals (Mason et al., 2016)^[53]:

- DSM-I (1952) – Bipolar disorder was classified as a psychotic disorder.
- DSM-II (1968) – Bipolar disorder was changed to classify as a mood disorder.
- DSM-III (1980) – Clear boundaries of the disorder were studied; it can only exist between polarity of extreme mood.
- DSM-IV (1994) – The bipolar disorder can exist in a "mixed state" between depression and manic.
- DSM-V (2013) – Mixed state was changed to "mixed features" which led to easier diagnosis of the disorder. These mixed features are broken down into four parts and classification of the disorder (Bhandari, 2020)^[47]:
 - Bipolar I – Mania lasts for 7 days. Depressive may or may not occur.
 - Bipolar II – Depressive alternates with a non-full Mania.
 - Cyclothymic Disorder – Depressive and Mania swaps for at least 2 years.
 - Unspecified Bipolar Disorder – Does not classify as any of the above.

iv. Substance-induced mood disorder

Since the 1950s, numerous reports have emerged that seem to cause mood disorders from substance usage. Symptoms arise from substance use, intoxication, and withdrawal (Preda et al., 2020)^[54]. Substance-induced mood disorder is a depression caused by using substances that affects millions of individuals. These include use of medicines, drugs, alcohol, and smoking cigarettes. To make sure that a patient's mood disorder is caused by substances, professional doctors verifies the patient whether they do not have depressive-symptoms prior to intaking these aforementioned substances. (Arakelyan, 2019)^[55]

Induced depressive disorder can be caused by medications such as use of: (1) steroid; (2) L-dopa; (3) antibiotic; (4) central nervous system drug; (5) dermatological agent; (6) chemotherapeutic drugs; and (7) immunological agent. These are the recognized disorders caused by medication use. On the other hand, psychoactive substances and drugs are much more highly likely to cause these substance-induced depression mood disorders. Such substances include (1) alcohol; (2) phencyclidine; (3) other hallucinogen; (4) inhalant; (5) opioid; (6) sedative; (7) hypnotic; (8) anxiolytic; (9) amphetamine; (10) other stimulants; (11) cocaine; (12) other substances; and (13) unknown substances. These are the numerous examples that cause mood disorders from psychoactive substances. (Hartney, 2021)^[56]

There are also individuals with withdrawal symptoms affected by these substance-induced mood disorders. Withdrawals are individuals halting themselves from using these substances, taking them lesser until they stop. However, withdrawing from using these substances causes a side-effect that makes them depressed and manic at times. Further indicates that substances cause mood disorders (Khan, 2020)^[57]. To alleviate these disorders, multi-faceted approaches such as Cognitive-behavioral therapy (CBT) are necessary. (Dzubak, n.d.)^[58]

c. History of Mental Health Illness

References of mental illness and its evolution throughout history has been cyclical rather than progressive as behaviors, considered whether to be normal or abnormal, are strictly dependent on the functions of a particular time and culture for each era. Moreover, behaviors that do not fall under the expectations of the sociocultural norms were used against individuals that were either controlled over or silenced. This had then created a focus of a less cultural relativist view on abnormal behavior rather than focusing on the possible threats of behavior to oneself and relationships with other individuals. Theories of etiology of mental illnesses were generally separated into three categories throughout history such as: supernatural, somatogenic, and psychogenic (Farreras, 2022)^[59]. The supernatural theory suggests that mental illness is caused by the possessions of evil and demonic spirits, planetary gravitation, curses, and sins. While somatogenic theory considers that mental illnesses are caused by identified disturbances in physical functioning that result from illness, genetics, and or brain damage and imbalance. Lastly, the psychogenic theory focuses on the possible cause of mental illness due to traumatic or stressful experiences, maladaptive learned associations or distorted perceptions. The three etiological theories of mental illness, thus, aids in understanding and determining the required treatment and care mentally ill individuals should receive (Worthy, 2020)^[60].

The history of mental health illnesses and abnormal behaviors, according to ancient beliefs, often resulted from the influence of supernatural causes such as demonic possessions, sorcery, and of works of evil spirits (Bridley et. al, 2018)^[61]. An example of the earliest supernatural explanations for mental illness is the trephination, a surgical method wherein holes were put in the skull with the use of hand drills and cutting or scraping techniques, that was thought to be a treatment for various ailments such as head injuries and a practice used to pull

spirits from the body in rituals (Bradford, 2018)^[62]. To add, more than 1,500 trepanned skulls were uncovered throughout the world, ranging from Europe and Scandinavia to North America, from Russia and China to South America- wherein about five to ten percent of the skulls were found from the Neolithic period with either single or multiple skull openings that vary in sizes. (Faria, 2015)^[63].

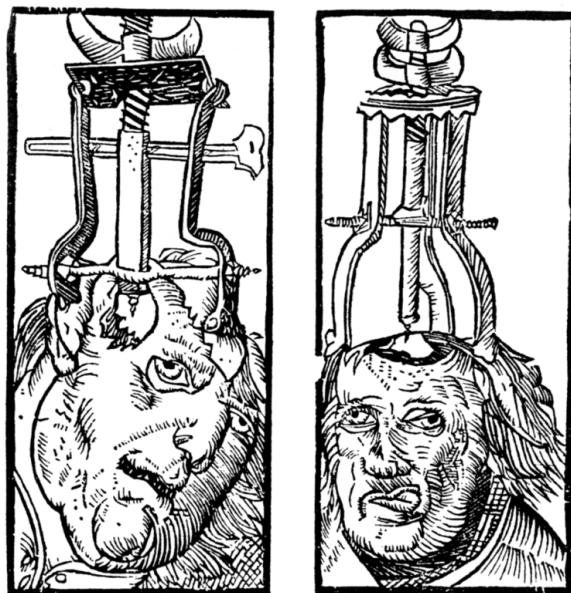


Figure 2.1.c.1 Trephination Engravings from 1525

Figure 2.1.c.1 showcases the treatment of trephination, wherein a stone instrument, *trephine*, was used to remove part of the skull to create an opening. Surgical drilling of holes in the skull were believed to treat head injuries, epilepsy, as well as releasing evil spirits trapped within the skull, ending the individual's mental affliction which returns them to normal behavior (Kchessler, n.d.)^[64].

In 460-377 B.C, the Greek physician Hippocrates had rejected the idea of demonic possessions as the cause of mental disorders. He had believed that mental disorders were related to physical disorders and are influenced by natural causes, as well as suggestions of brain

pathology, also defined as brain dysfunction or diseases, which were also affected by heredity. In attempts to further separate superstition and religion from medicine, Hippocrates had systematized a belief that may be held responsible for physical and mental illness among individuals - a deficiency or an excess in one of the four essential body fluids or humors such as: blood that arose from the heart, black bile arising in the spleen, yellow bile from the liver, and phlegm from the brain, wherein occurrence of mental disorders may be present when the humors are in state of an imbalance (Kchessler, n.d). Greek philosopher Plato (429-347 B.C), also emphasized that the mentally ill should not be punished as they were not responsible for their own actions. He believed that the community along with the families of the mentally ill should be responsible for the care of the mentally ill in a humane manner. Greek physician, Galen (A.D. 129 - 199) suggested that mental disorders may have had either physical or mental causes such as fear, shock, alcoholism, head injuries, changes in menstruation, and adolescence (Bridley et. al, 2018).

Mental illness in the Middle Ages was viewed yet again due to the cause of possessions of the Devil, which methods such as exorcism, flogging, prayers, chanting, visitation of holy sites, and use of holy water were used to free the individual from the devil's influence. Mass madness and group hysteria were also evident in this time period that displayed similar symptoms and false beliefs amongst large numbers of people (Bridley et. al, 2018). In addition, according to the Baton Rouge Behavioral Hospital (2020)^[65], during these times the mentally ill were both misunderstood and treated cruelly, oftentimes being treated as outcasts as people were viewed to be under the influence of supernatural ideas. Europe, in particular, administered beatings to mentally ill individuals that acted as punishments for the disturbances caused by

abnormal behaviors and also to serve as teachings for individuals to be cured out of their illnesses (Foerschner, 2010)^[66].

In the 16th century, the realizations with rising numbers of people being afflicted with mental illness had led the government to place the mentally ill in asylums, or places of refuge rather than private homes - where the service of care were to be provided to patients as hospitals and monasteries were then converted into asylums. However, the benign intention in the beginning was soon replaced by mistreatment due to the overflow of patients which led them to be treated more like animals than people (Bridley et. al, 2018). The Saint Mary of Bethlehem in London was opened in 1547 for the sole purpose of confining individuals with mental disorders, however it soon became infamous for the ill treatment towards its patients. Inmates were mostly institutionalized against their wills, patients were chained up and lived in filth, and were commonly exhibited to the public for a fee (Farreras, 2022). Moreover, the majority of the staff that worked within the asylums were untrained, unqualified individuals that mostly mistreated the patients within the asylums. Even with the instances where patients were attempted to be cured with treatments, common practices typical for the time period included purging and bloodletting - additional forms of treatment included dousing patients into either hot or cold water, having the idea that the shock would revert the patient's mind back into a healthy state. Use of straightjackets, physical restraints, and threats to patients were also made by the staff to further try to cure the mentally ill patients (Sunrise House Treatment Center, 2020)^[67]. In the mid-17th century, tools such as the gyrating chair were popular among Europe and the United States that were intended to shake up blood and tissues of the body to restore equilibrium but rather resulted in rendering patients unconscious with no recorded success (Foerschner, 2010).

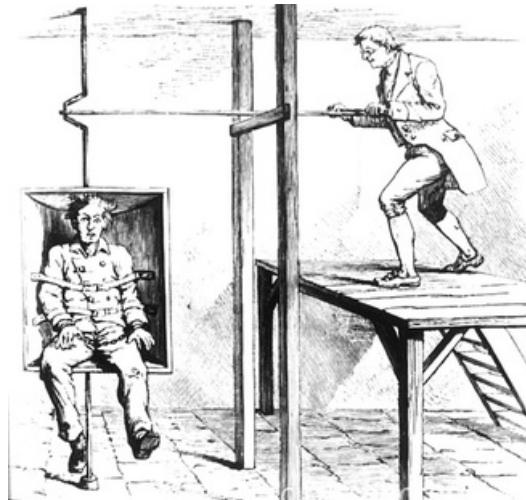


Figure 2.1.c.2 Dutch Dr. Boerhaave's Gyrating Chair

Figure 2.1.c.2 is an illustration of the gyrating chair invented by Dr. Boerhaave brought to the United States by Dr. Benjamin Rush. The machine was intended to shake up the blood and tissues of the brain to restore equilibrium and increase the blood supply to the brain, spinning at speeds up to 100 rpm. However, no improvement was found with the patient's condition as it only succeeded in rendering patients unconscious (The Ohio State University, 2017)^[68].

Humanitarian view of mental illness grew as protests rose over the conditions that the mentally ill lived under by the 18th century. Reforms on mental asylums started with the rise of the moral treatment movement for the people with psychiatric conditions as they were treated usually in inhumane and brutal ways (Trent, 2021)^[69]. Phillippe Pinel (1745 -1826), was one of the earliest proponents that was an assigned superintendent of la Bicetre, a hospital for mentally ill men in Paris, to which he tested his hypothesis and emphasized the importance of humane treatment, respect, and moral guidance among patients and how it contributed to the improvements of their conditions which led to several releases of patients from the hospital (Sunrise House Treatment Center, 2020). Around the same time as Pinel, reforms were also done in England by William Tuke (1732 -1822), an English Quaker merchant, who established the

York Retreat to provide care for the insane. Traditional medical interventions were rejected as patients in the retreat were allowed to engage in reading, light manual labor, and conversations. The York Retreat remained small, never having more than thirty residents, thus, enabling individual focus among the needs of its residents (Trent, 2021). Reforms in the United States started with Benjamin Rush (1745-1813), who is a figure largely considered as the father of American psychiatry. Humane treatment was advocated for the mentally ill where they were treated with respect and occasionally given small gifts. However, despite all of this, his practices included treatments of bloodletting and purgatives, invention of the tranquilizing chair, and also reliance on astrology which followed the beliefs of their current time (Bridley et. al, 2018).



Figure 2.1.c.3 Scarificator

Figure 2.1.c.3 shows an image of the scarificator, a cube-based brass box device that featured multiple blades that delivered a uniform set of parallel cuts (Cohen, 2012)^[70]. Bloodletting was used to get rid of impure fluids to cure a host of their conditions Zimlich (2021)^[71], the medical procedure was then used by Dr. Benjamin Rush as he believed that the flow of blood in the body was the main source of mental or physical illness (Levin, 2019)^[72].

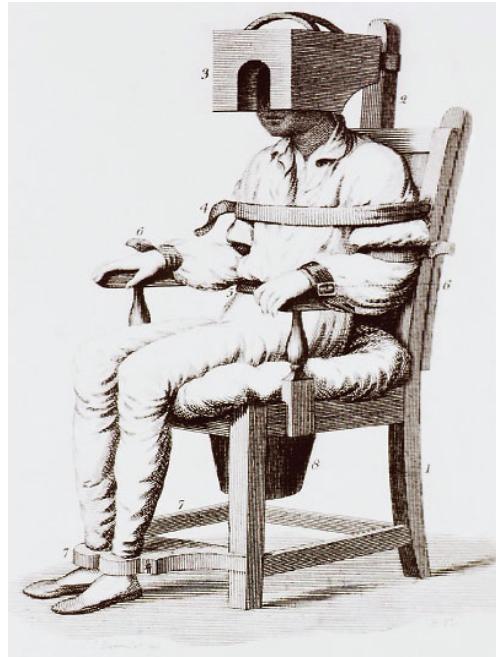


Figure 2.1.c.4 Dr. Benjamin Rush's Tranquilizing Chair

Figure 2.1.c.4 is an illustration of the tranquilizing chair developed by Dr. Benjamin Rush in 1810. During their time, arterial disease was believed to have caused madness among individuals. The purpose of the chair was to control the blood flow towards the brain and to reduce the force and frequency of the pulse (Levin, 2019).

Despite the effectiveness of the moral treatment movement among the mentally ill, it was soon abandoned in America near the second half of the 19th century as asylums started to overcrowd leading to staff shortages and lack of funds to provide necessary care (Kchessler, n.d). Bridley et. al, (2018), also adds that the specified treatment was not suitable for other patients as different treatments were required. Moreover, it was also recognized that the moral treatment was more effective among facilities with a number of patients lower than 200. With the discovered negligence from the conditions - retired school teacher, Dorothea Dix, advocated for the establishment of state hospitals wherein she helped establish over 30 mental institutions in the United States and Canada between 1840 and 1880 (Farreras, 2022) . By late 19th century, the

moral treatment gave way to the mental hygiene movement which was founded by a former patient, Clifford Beers, who published his autobiography *A Mind That Found Itself* - to which the publication chronicled his struggles with mental illness along with the shameful conditions that were endured in mental institutions in America according to Virginia Commonwealth University (2021)^[73]. Furthermore, his story had aroused sympathy with the public that led to the founding of the National Committee for Mental Hygiene in 1909 (Bridley et. al, 2018), now known as Mental Health America, which aims to provide the goals of prevention and improved attitudes towards mental illness as well as providing services for people with mental health conditions (Mental Health America, n.d)^[74].

With the decline of moral treatment, within the late 18th century and throughout the 19th century, European psychiatry struggled with the explanation of mental illness rising into two perspectives - the somatogenic and psychogenic perspective (Bridley et. al, 2018), which focused particularly on hysteria, which caused blindness or paralysis with no apparent physiological explanation. Moreover, several treatments soon followed for the psychogenic perspective on mental illness, wherein electric shock treatments were used in the 1930s and psychiatric or psychotropic drugs were used for treatment for mental illness as it was thought to improve symptoms rather than basing it as a cure in the 1950s - resulting to deinstitutionalization, or the release of patients from mental health facilities. Hypnosis was also used in treatment for hysteria, which led to the development of the cathartic method- introduced by Josef Breuer (1842-1925) and developed by Sigmund Freud (1856 - 1939) in late 19th century, wherein patients underwent a therapeutic procedure of recalling or reliving traumatic events to gain insights and emotional relief. This then became a precursor for psychoanalysis, a dominant psychogenic treatment for mental illness during the first half of the 20th century (Farreras, 2022).

Following within the late 19th and early 20th centuries, a somatic view of mental illness was held by physicians- which mental health problems were assumed to be a defect in the nervous system. Asylum doctors then applied various treatments, in attempts of correcting the flawed nervous systems of the patient's bodies, which most often included hydrotherapy, electrical stimulation, and rest (Holtzman, 2012)^[75]. Kchessler (n.d), also adds that restraints, electro-convulsive shock therapy, and lobotomies continued to be employed in American state institutions until the 1970s, but made way for a burgeoning pharmaceutical industry that viewed and treated mental illness as a chemical imbalance in the brain.



Figure 2.1.c.5 Hydrotherapy

Figure 2.1.c.5 represents the hydrotherapy treatment, a tool for treating mental illness, wherein patients were wrapped tightly in wet sheets, then wrapped with another rubber sheet to let them sweat for hours. Physicians believed that it relieved congestion in the brain and also eliminated toxins that cause insanity. Patients were put in warm baths that would last for either hours or even days (Zhang, 2018)^[76].

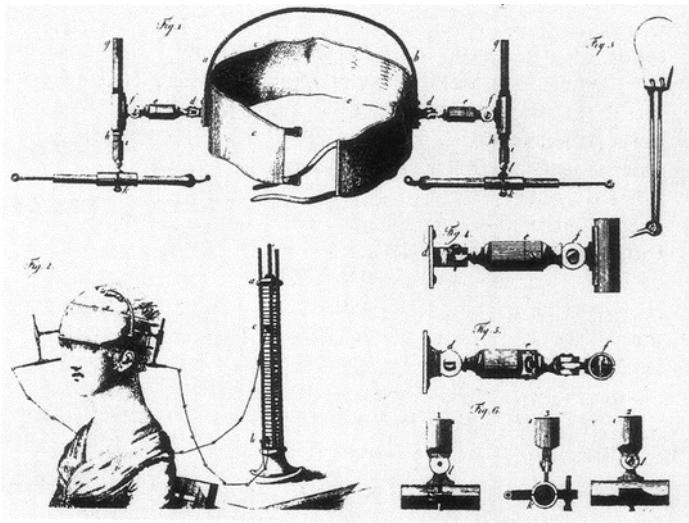


Figure 2.1.c.6 Electrical Stimulation Therapy

Figure 2.1.c.6 is an illustration of the early machines used for electrical stimulation therapy - making use of battery, friction or static in generating a low electrical current. It is claimed that the procedure could generate feelings of euphoria and improve mental performance. However, its use was thought to have produced side-effects such as headaches, dizziness, and nausea, making its use unregulated (Bell, 2020)^[77].

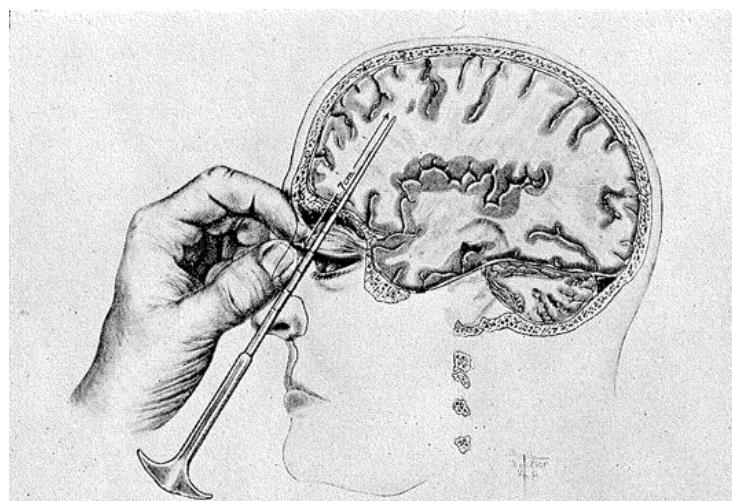


Figure 2.1.c.7 Lobotomy Procedure

Figure 2.1.c.7 illustrates the process of lobotomy, a neurosurgical operation that involves permanently damaging parts of the brain's frontal lobe. Lobotomies had been controversial yet were widely performed for more than two decades as treatment for schizophrenia, manic depression and bipolar disorder among other mental illnesses (Lewis, 2021)^[78]. The intended effects for lobotomy was to reduce tension or aggression, however, patients have shown effects such as apathy, passivity, lack of initiative, poor ability to concentrate, and decreased depth and intensity of their emotional response to life (Augustyn, n.d)^[79].

Introduction to new psychiatry into the world started in the 20th century as different perspectives also began to be introduced regarding mental disorders. German psychiatrist, Emil Kraepelin (1856-1926), introduced a plan for a more comprehensive psychiatry- which he began to study and promote the ideas of disease classification for mental disorders. Diagnoses were recognized as far back as the Greeks, until in 1883 that Kraepelin had published a comprehensive system of psychological disorders centered around a pattern of symptoms, which he called syndromes, suggestive of an underlying physiological cause. Suggestions of popular classification systems were also proposed by other clinicians but the need for a single shared system paved the way for the American Psychiatric Association's 1952 publication of the first Diagnostic and Statistical Manual (Kchessler, n.d). Moreover, lithium had become the standard for mental health treatment, and other drugs including chlorpromazine, more known as Thorazine, Valium and Prozac were some of the most prescribed drugs for depression across the world during the middle and latter decades of the 20th century. Various psychoactive drugs are also used in targeting a variety of mental health disorders to provide a degree of comfort for patients as well as privacy on how their conditions are treated. In the 21st century, achieving help in health and recovery is done under drug therapy and counseling ,however, challenges on proper

treatment for mental health treatment still remain but the evolution and advancements suggest that the improvements discovered and implemented today are progressing compared to earlier events (Sunrise House Treatment Center, 2020).

d. Therapeutic Interventions and Techniques

i. Automatic Thought

1. What are automatic thoughts?

These are thoughts that are immediate, habitual, and nonconscious. These negative automatic thoughts can affect the mood and the actions of a person. These are negative thoughts that a person must be aware of, especially their impact on the mood and actions of a person. (American Psychological Association, n.d.)^[80]

Automatic thoughts are thoughts that pop up or flash on your mind without any conscious effort. It is sometimes beneficial to have automatic thoughts, but in most cases, having automatic thoughts is not healthy for a person with depression or anxiety. (Alleydog, n.d.)^[81]

2. Why focus on thoughts?

A mind is a thought processing machine. A mind creates and filters thoughts every day for as many as 60,000 ideas a day. The mind is good at filtering ideas that are not important and chooses the ideas that are important in a specific situation. The process works well all the time, but sometimes the mind tends to focus on irrelevant thoughts and filter out the relevant bits of thoughts. Sometimes, people assign meaning to something that is not totally leveled to the actual facts of the situation. This phenomenon is called *negative filtering*, meaning, filtering out all thoughts except for the negative ones. Despite the situation being positive, the person sees it

negatively as a whole. Negative filtering triggers emotions of disappointment, depression, and anxiety. (Cognitive Behavioral Therapy Los Angeles, n.d.)^[82]

3. How to identify automatic thoughts?

According to BetterUp, in order to identify automatic thoughts the person must first identify the unpleasant feelings. The person may identify frustrations, disappointment, sadness, and anxiety and these negative emotions are essential to be identified immediately. The second step is to identify the thought that caused that negative feeling. The person may answer the question “what are my feelings reacting to?” to identify the thoughts that cause the person to have negative feelings. The last step is to be aware enough to recognize the patterns of an individual’s mood patterns. (Roncero, 2021)^[83]

4. Relationship between automatic thoughts and depression

According to research, there are 115 volunteer teacher candidates with ages that range from 21 to 29 from Turkish University. The data were collected by using Beck Depression Inventory, Life Satisfaction Scale, Automatic Thoughts Scale, Symptom Interpretation Questionnaire, and Personal Information Form. According to the results, the depression scores of young adults do not differ according to their gender. Other findings through the scale, are that the five variables which are negative automatic thoughts, life satisfaction, number of symptoms, psychologizing, and normalizing are significant forecasters in explaining the depression level of young adults. (Yavuzer & Karatas, 2017)^[84]

ii. Automatic Thought Journal

1. What is an Automatic Thought Journal?

An Automatic Thought Journal is a thought record and a Cognitive Behavioral Therapy tool that help in identifying automatic negative thoughts that are creating problematic mood swings. (Therapy Sf, 2020)^[85]

2. What are the benefits of using Automatic Thought Journal?

Automatic Thought Journal is an important tool for Cognitive Behavioral Therapy. Furthermore, it is useful because it enables us to see the negative automatic thoughts, it helps us to identify any problems with our thinking, it can help us create alternative thoughts and correct our thinking. (Psychology Tools, 2020)^[86]

3. What is Cognitive Behavioral Therapy?

Cognitive Behavioral Therapy is a form of psychological treatment that has been very effective in treating various mental health problems such as depression, anxiety, alcohol, and drug use problems, marital problems, eating disorders, and severe mental illnesses. Moreover, there are numerous studies that say that Cognitive Behavioral Therapy improves the quality of life. In addition, in most studies, it is mentioned that CBT is more effective than any psychological therapy or psychiatric medications. (American Psychological Association, 2017)^[87]

4. Automatic thoughts and Cognitive Behavioral Therapy

Cognitive Behavioral Therapy is a type of Psychotherapeutic treatment that helps in identifying negative automatic thoughts and changing any destructive or problematic patterns of thinking that influence negative behavior and emotions. Cognitive Behavioral Therapy focuses on changing the automatic negative thoughts that can contribute to depression and anxiety. Through the use of Cognitive Behavioral Therapy, these automatic negative thoughts are challenged and replaced with alternative and more realistic thoughts. (Cherry, 2021)^[88]

5. Advantages and Disadvantages of Cognitive Behavioral Therapy

Cognitive Behavioral Therapy is very effective in treating mental health disorders and it may be helpful in some cases where medications are not effective. It is equally important to know that Cognitive Behavioral Therapy is also effective and can be done in a short period of time compared to any talk therapy. In addition, Cognitive Behavioral Therapy is effective in re-training the person on how he or she thinks and altering the person's behavior in order to make changes on how the person feels about a situation. Furthermore, the skills you have learned during Cognitive Behavioral Therapy would offer you great help in coping with future stresses and difficulties in life even after the treatment. On the other hand, the person must commit to the process of therapy because it will not be effective without the person's cooperation. In addition to that, attending sessions of Cognitive Behavioral Therapy and carrying out extra work between sessions may cause a lot of time investment. Furthermore, Cognitive Behavioral Therapy includes facing out your anxieties and emotions - making you feel more anxious and uncomfortable. Uniquely, Cognitive Behavioral Therapy only focuses on changing how you feel and how you think, but Cognitive Behavioral Therapy does not cover a wider range of problems in systems or families that often have a great impact on the person's mental health and wellbeing.

(The CBT Clinic, n.d.)^[89]

iii. Mood Diary

1. What is a Mood Diary?

A mood diary is a tool used for recording a person's mood in intervals. The purpose of this tool is to identify the patterns of mood irregularities due to different situations and circumstances. Furthermore, a mood diary or mood tracker is more helpful for people with

depression, anxiety, and mood disorders, to help regulate emotions. Mood trackers or mood diaries can be handwritten or digital. (Cherry, 2021)^[90]

2. Advantages and Disadvantages of Mental Health Apps

Mental health applications can help in executing treatments anytime and anywhere and may be ideal for those people who hesitate in in-person appointments. Uniquely, the person can seek treatment options without involving other people using free applications available on different platforms. Furthermore, technology can help mental health professionals to offer treatment to remote areas most especially in case of immediate need. Technology can also provide 24-hour monitoring and intervention to the person. Uniquely, technology can collect quantitative data or information such as location, movement, physical activity, phone use, and other information. On the other hand, the biggest concern with technological interventions is the ability to obtain scientific evidence that they work. Furthermore, another concern is whether the applications are suitable for all people and for all mental health conditions. Also, some apps promise so much more than it delivers, consumers may turn away and find more effective therapies. Moreover, applications deal with sensitive information and the developer must make sure that it is safe. (katieelder4, 2020)^[91]

2. Review of Related Studies

a. Mood Studies

i. Definition of Mood

The mood is critical and too complex to define. The mood reflects the notion that can not be easily grasped. The origin of mood relies on the four humors which are the blood, phlegma, yellow, and black bilious. These four liquids are the main essential for the mood to be stable. The mood is difficult to define because one's judgment depends on the perception of the mood of

other people. Moreover, it is highly subjective backed with personal references (Amado-Boccaro I, Donnet D, & Olié JP, 1993)^[92]. On a more modern take, mood is a state of diffuse and unfocused — meaning it is not directed to a specific person, object, or an event. It is a moment to moment experience that usually lasts for a long time (Lischetzke, 2014)^[93]. Mood state is also hyperpriors than uncertainties (usually emotions) in a more hierarchical setting. It is complex and heterogeneous in nature; unpredictable and multifactorial. (Clark et. al., 2018)^[94]

ii. Mood-related Statistics

According to the data from the National Health and Nutrition Examination Survey, 8.1% of adults aged 20 and over experienced depression during 2013 – 2016. 10.4% of women were more likely to have depression than men (5.5%). 80% of adults with depression experience low motivation in work, difficulty at home, and difficulty in social activities. (Brody, D., et al., 2018)^[95]

iii. Effects of Mood Disorders

A total of 1.1% of the workers met Composite International Diagnostic Interview criteria for Bipolar Disorder (I or II). On the other hand, 6.4% meet the criteria for major depressive disorder. Bipolar Disorder was associated with 65.5 and major depressive disorder with 27.2 lost workdays per diseased worker per year. According to subgroup analysis, those with Bipolar Disorder have higher work loss than those with major depressive disorder because of more severe and more persistent depressive episodes in those with Bipolar Disorder. (Kessler Ph.D., R., et al., 2006)^[96]

iv. Factors that Affect Mood Changes

According to a study by Wiśniewska and Nowicka (2018)^[97], mood changes differ from one individual to another. A number of factors that changes one's mood are the following: (1)

induced mood, checks if an individual's mood is positive or negative, (2) the level of cognitive loading, checks if an individual's conditional state are easy or hard, (3) direct mood, checks an individual's adjective check list, and (4) indirect mood, checklist for an individual's state of emotional version. Mood changes from these factors often explains how an individual's mood varies from day to day basis. Furthermore, a meta-analysis study by Aguilar et al. (2019)^[98] explains independent variables that affect mood changes such as music and films. It has been studied that these variables can in fact change a person's mood either positively or negatively. This can be considered an induced mood change from the previously cited factors of mood changes from Wiśniewska and Nowicka's (2018) study which can successfully influence and persuade a person to change their mood. Moreover, a document released by the Public Health Agency of Canada (2021)^[99] has indicated several factors that cause mood disorders to an individual. These factors include (a) genetic influence – how history of mood disorders in a family affects mood disorders; (b) previous episode of depression – how a major episode of mood disorder predicts future mood disorder changes; (c) stress – individuals experiencing stress are susceptible to mood changes and mood disorders; (d) physical illness – chronic medical conditions and illnesses such as epilepsy, arthritis, cancer, AIDS and chronic obstructive pulmonary disease (COPD) is a strong factor that causes an individual's prolonged mood changes and its related disorders. These are the numerous factors that affect mood changes to individuals as stated by the Public Health Agency of Canada (2021)^[99].

b. Mood-Monitoring Application Studies

i. How Mood-Monitoring Applications Affect Mood

Mood-monitoring applications, in current times, are often more than just a place that records emotions. Many applications allow users to record relative factors that closely affect one's mental health such as sleep, nutrition, and exercise (Blanchfield, 2022)^[100]. According to a study from Kauer et al. (2012)^[101] on self-monitoring using mobile phones in the early stages of adolescent depression, the use of mobile phone self-monitoring programs are ideally suited to first-step intervention programs for depression as it decreases depressive symptoms for young people with mild or more depressive symptoms. Moreover, Dubad et al. (2021)^[102], states that preliminary and limited evidence from ecological momentary assessment studies had indicated mood-monitoring tools may be able to improve mental health outcomes and therapeutic engagement in the youth, wherein benefits may include increased self awareness which could indirectly improve young people's depressive symptoms. On the other hand, Kinderman et.al (2018)^[103] conducted a study which investigated the short-term impacts of the Catch it application on its user's mood. The application provides features which allows users to (1) record their moods and its intensity (2) reflects on inputted mood entry (3) asks users for an alternative solution on a specific problem relating to their input (Wallace, n.d)^[104]. Findings of the study have shown that there were statistically significant reductions in negative mood intensity and increases in positive mood intensity. Overall, mood monitoring applications can benefit individuals especially those who are dealing with mood disorders such as major depressive or bipolar disorders. Mood monitoring can be beneficial as they can track fluctuations to better identify their moods, reduce impulsivity, and be able to better communicate with mental health

professionals with the recorded data which may serve as references during appointments (Blanchfield, 2022).

ii. Advantages and Disadvantages of Mood-Monitoring Applications

The use of mood-tracking applications were primarily motivated by negative events or shifts in an individuals' mental health which prompts the engagement of tracking and improving their personal situation. Mood-monitoring apps enable users to facilitate self-awareness that is beneficial when looking back on previous emotions or overall mood experiences. Users also prefer the ability to personally customize their mood tracks that fits their needs, along with the appreciation of the simplicity of visualized figures, calendars, inputted emotions and moods in understanding common trends among their input. However, there were instances wherein users failed to accurately record their moods as some users reported less inclination towards documenting their negative mood states and preferred to only include their positive moods. Despite the helpful features offered by mood-monitoring applications, improvements are still needed in relation to consistent mood-tracking inputs (Schueller, 2021)^[105]. Dubad et al. (2021), also emphasized in their study that the user's perception on mood-monitoring applications may possibly contribute to its disadvantage wherein respondents in the study reported various concerns about the use of such applications with worries about privacy and unauthorized access, lack of trust in apps, and the accuracy of information.

c. Journaling Application Studies

i. How Journaling Application Affect Mood

Smartphones are now commonly used as a platform for mental health and wellness applications. Smartphone apps for mental health and wellness reach millions of people and may have potentially reduced the public health burden of common mental health problems. The results were quite positive. Overall, 72% (88% of men and 63% of women) stated that they have experienced “surprising and unexpected” results from digital journaling over the past thirty days. Nearly half (49%) of all participants reported that they agreed or strongly agreed that they were comfortable with digital journaling than before. 72% of men and 69% of women felt that their entries during the challenge expressed their innermost thoughts and feelings (Adams, Ohren, and Hudson, 2015)^[106].

ii. Advantages and Disadvantages of Journaling Applications

According to a research, patients were satisfied with a journaling app named “mDiary app” as it was “easy to use” and always available. Inside-out innovation was found to influence the perceived usability negatively among the interviewed therapists. The patients rated the usability of the journaling application as high, while the therapists rated the journaling app at an average level. Users with older age correlated with lower usability ratings. Meaning, users with older age may not understand how to use the journaling application. While patients that are younger see the journaling application as “helpful” and “easy to use” (Helweg-Joergensen, S. et al., 2019)^[107].

3. Review of Related Systems

a. Related Applications

i. Web Application

1. Teammood

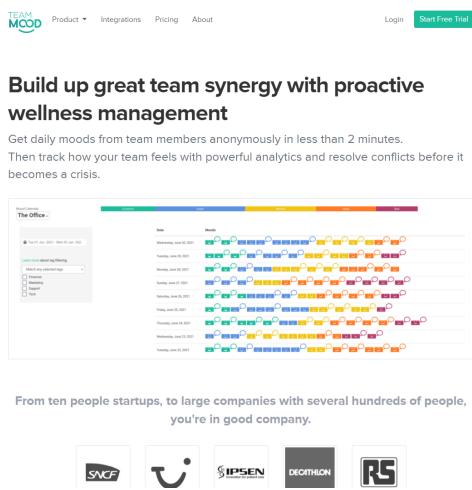


Figure 2.3.a.1 TeamMood Website

Teammood is an application for managers and teams as it is used to provide management and a clear understanding of the overall events in the workplace. Team members may anonymously send their daily moods in less than 2 minutes which allows tracking of how the team feels with powerful analytics to resolve conflicts (TeamMood, n.d)^[108].

Features:

- **Easy And Quick To Use:** Creates the right habits to foster communication within the team in the long term as TeamMood gathers teammates' feelings in just a few minutes.
- **Mood Tracking:** Tracks the mood of the team as well as measuring the team in terms of productivity, lead time, bugs, etc. Niko-Niko calendar is used by each

member to share their moods by sticking happy, straight, frowning, or color stickers on.

- **Anonymous Feedback:** Feedbacks collected from the team are anonymous to create a safe environment. This allows members to freely express themselves, foster communication, and empower everyone inside the team.
- **Analytics:** Provides a clean and clear overview of the team's mood and allows segment data to get accurate analytics to handle given situations quickly. It includes a reporting dashboard that covers (1) Mood average variation : to see average mood changes over time (2) Best and worst days : to determine the best days and the worst (3) Wordcloud: to find the most used words in the team's comments (4)Usage: to discover how much members make use of TeamMood.

2. MoodPanda

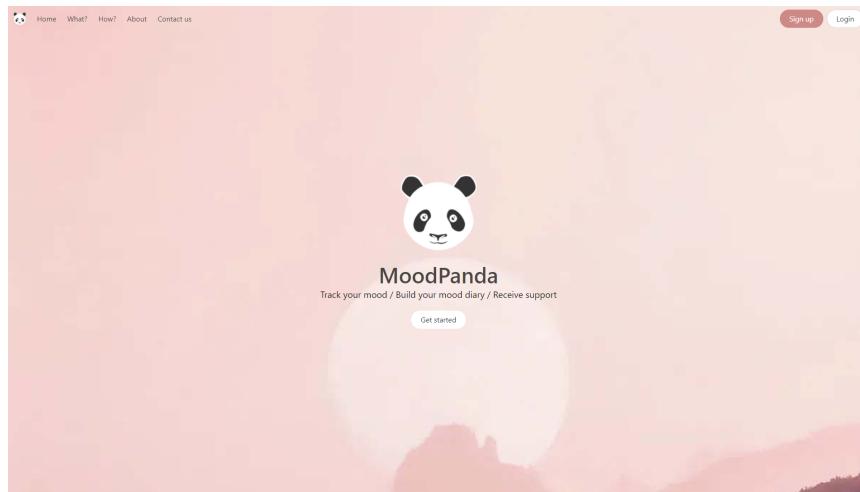


Figure 2.3.a.2 MoodPanda Website

MoodPanda is a mood tracking app that allows users to monitor their mood, build a mood diary, and receive anonymous support within the community. It is designed to monitor and trace one's feelings to create a deeper understanding of oneself to improve their mental health (MoodPanda, n.d)^[109].

Features:

- **Tracks Your Mood:** Allows users to rate their mood from 0-10 in terms of how they feel - including possible circumstances and internal feelings.
- **View Analysis:** Shows the reviews of the mood diary each day to help in viewing mood calendars, identifying patterns, and provides graphical analysis of the users posts over time.
- **Interacts With MoodPanda Community:** The application allows people to comment on posts, if allowed by user, to give and receive support within the members of the community.
- **Privacy Mode:** Allows anonymity within mood diary and posts.

3. eMoods

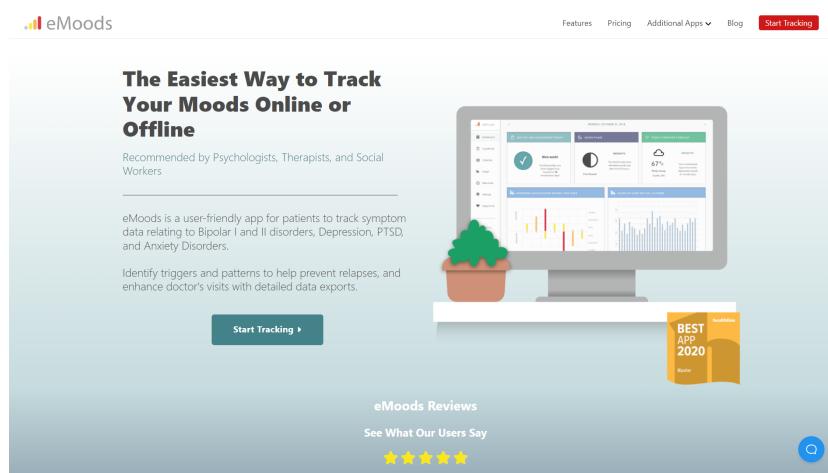


Figure 2.3.a.3 eMoods Website

eMoods is a user-friendly mood tracking app compatible for patients with bipolar I and II disorders, depression, PTSD, and anxiety orders. Related data such as user's highs and lows, sleep, and medications, and symptom related bipolar and mood disorders are tracked - to identify triggers and patterns to aid in preventing relapses, provide detailed data exports to enhance doctor's visits, and create peace by understanding mood patterns (eMoods, n.d)^[110].

Features:

- **Mood & Symptom Diary:** Allows tracking of daily highs and lows, sleep, medications, and Bipolar/Manic Depressive illness related symptoms.
- **Track Your Medications:** Tracks taken medications as well as the breakdown either by time of day, day, daily, or as-needed. It also includes reminders and immediately visualizes whenever users miss a dose.
- **A Detailed Calendar:** Allows visualization of patterns over time to get a birds-eye view into the user's mood disorder.
- **Configurable Graphs:** Aids in visualizing the possible triggers caused by symptoms or outside influences by plot tracking points against each other.
- **Email Reports:** Reports can be emailed to the user's doctor or therapist and also share data and online charts with friends and family members.
- **Interact With Members:** Valuable Bipolar resources may be viewed and interaction with other eMoods Insights users are allowed on a members-only forum.
- **Relax, We'll Remind You:** Multiple email and SMS reminders may be set for users and get notified whenever it's time to fill out charts, take medications, etc.

- **Factor In Weather:** Local weather, daylight, and moon faces are fully integrated into the application to help users visualize the mood effects and other symptoms upon outside influences.

ii. Mobile Application

1. Daylio Journal

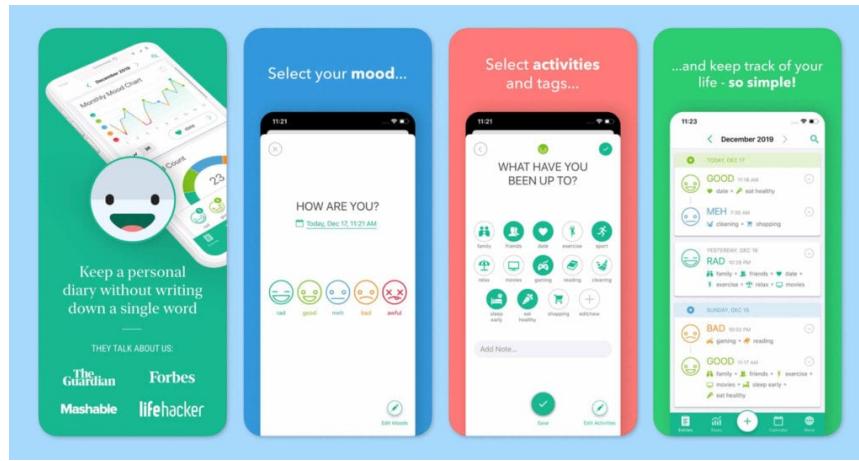


Figure 2.3.a.4 Daylio Journal Mobile App

Daylio is a mobile application that serves as a self-care bullet journal, mood diary, and happiness tracker. It is a versatile app used to track fitness goals, food log, exercise, gratitude diary, mood tracker, etc. to take care of mental, emotional, and physical health. Daily entries can be created in two taps-to pick a mood and activities as data is crunched and displayed in stats, charts, and correlations (Daylio, n.d)^[111].

Features:

- Custom activities make use of a big database of beautiful icons
- Moods can be mix and matched using funny emojis
- Monthly or yearly statistics created from the logs may be explored
- Advanced statistics for every mood, activity or group
- Customized color themes

- Dark mode
- Showcases whole year in ‘Year in Pixels’
- Creation of daily, weekly and monthly goals for motivation
- Build habits and collects achievements
- Statistics sharing is available with friends
- Backup and restores entries safely to cloud storage
- Sets reminders and create a memory
- Keeps entries safe with PIN lock
- PDF or CSV documents can be exported to share, print or analyze entries

2. iMoodJournal



Figure 2.3.a.5 iMoodJournal Mobile App

iMoodJournal is a personal journal and mood charting tool that not only tracks moods but also: sleep, medication, stress and anxiety, energy level, and cycles to aid users in collecting insights about oneself as they discover and record the causes of their ups and downs. (iMoodJournal, n.d.)^[112].

Features:

- **Mood Tracking:** Moods can be tracked as many times per day as needed. Self-portrait photos may be attached to analyze how the user's mood affects their appearances.
- **History Chart:** An editable animated mood history chart is used with full mood history, as well as weekly and daily average charts, to browse history of mood records and discover correlations between mood and measurable essences such as medication, sleep, etc.
- **Smart Hashtags:** Mood records are filtered by #hashtags and establishes associations between moods and experiences, as well as spotting triggers of mood changes with Top and Negative #hashtag charts.
- **Automatic Reminders:** Reminders are set to notify users to track moods on schedule as much as needed throughout the day, including random tracks.
- **Data Safety:** Data is secured by backup app data, synchronized with iCloud, and the application is protected with passcode.
- **Sharing Moods:** Moods and statistical data may be seen on the colorful map if geolocation is enabled. Moods may also be shared with friends on social networks, as well as exporting data to CSV or PDF and send by email.

3. Breathe2Relax

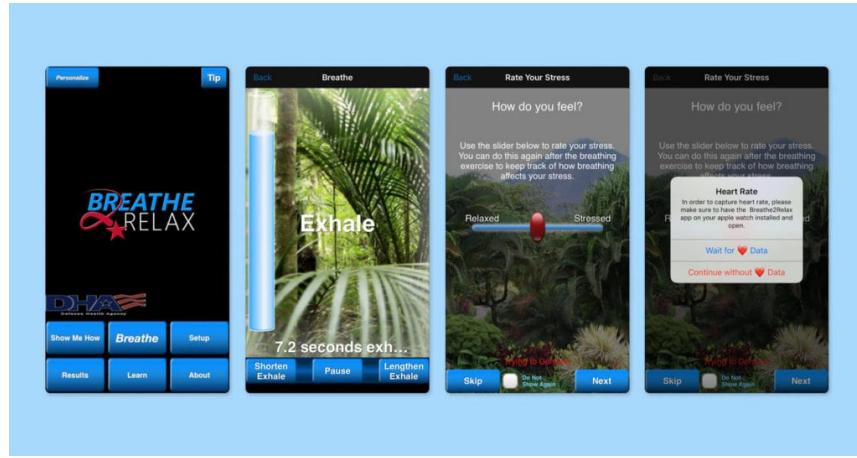


Figure 2.3.a.6 Breathe2Relax Mobile App

Breathe2Relax serves as a portable stress management application that provides detailed information on the effects of stress on the body as well as instructions and exercises to aid users in learning stress management skills through diaphragmatic breathing. The application can be used as a stand-alone stress reduction tool, or it can also be used in tandem with clinical care directed by a healthcare professional (National Center for Telehealth & Technology, 2011)^[113].

Features:

- **Guided relaxation:** Breathing exercises are included to help with mood stabilization, anger control, and anxiety management.
- **Education and Information:** Reading materials and videos on diaphragmatic breathing are included, along with the biology of stress, effects of stress on the body, and wellness tips.

b. Tools and Technologies

i. Web Technologies

- **HTML**

The Hypertext Markup Language is a primary building block of creating a website as it is used to describe the structure of information on a webpage. HTML aids in building effective sites which can be tailored to the individual's needs. It establishes the presentation and actual structure of the site and improves the site's accessibility. HTML serves as a foundation for websites and it often works together with Cascading Style Sheets (CSS) and or Javascript, when properly applied, it can then clearly define headers, paragraphs, subheadings, images, and essential elements used throughout the site. (Design Bombs, n.d.)^[114]

- **CSS**

Cascading Style Sheets (CSS) is a stylesheet language used to define the styles for web pages. It describes the layout and formatting along with making web pages more presentable easily. CSS is generally used with HTML which can help in controlling the text color, font style, spacing of paragraphs, sizing of colors, and many more. (javaTpoint, n.d.)^[115]

- **Bootstrap**

Bootstrap is a CSS Framework that provides responsive and efficient websites that can also render mobile-responsiveness to web applications for better product quality and effect (W3Schools, n.d.)^[116]. It is the most popular toolkit for front-end open source web development design that caters to mobile-first sites. It uses frameworks such as Sass variables and mixins, responsive grid systems, extensive prebuilt components, and JavaScript plugins. (Bootstrap, n.d.)^[117]

- **JavaScript**

JavaScript is a scripting or programming language that allows a programmer to implement complex features and functions in web pages. Instead of having a static website, JavaScript allows the programmer to create functional features such as displaying timely content updates, interactive maps, animated 2D/3D graphics, and etc. (mdn web docs, n.d)^[118]

- **Chart.js**

Chart.js is an open-source JavaScript library for interactive and responsive data visualization of a system's database. It currently supports 8 types of assorted charts: line, bar, radar, doughnut, pie, polar area, bubble, scatter, area, and mixed charts. The library is created by Nick Dawnie and his Chart.js Team and contributors. As of July 2022, build 3.8.0 is the latest release of the free library. It features tremendous scale tracking, plugins, advanced animations, performance, and mixed chart type for convenience! (Chart.js, 2022)^[133]

ii. Database Modeling Tool

- **Firebase Database**

Firebase Realtime Database is a NoSQL database used for storing, syncing and querying real-time application data between users on a universal scope. It can be used on web and mobile applications in order to (1) collaborate across devices for data portability and accessibility, (2) build serverless applications using mobile and web SDKs for creation of applications without the need for server systems, (3) optimized offline use that uses local caches to store and serve changes in the application, and (4) strong security for protecting user data from unauthorized access and possible data breachers. In terms of deletion of data, Firebase Database has a

limitation of not fully being able to delete the data collections and subcollections outside the online console and is not recommended due to negative security and performance implications, wherein deletion is opted only within the console of Firebase (Firebase, n.d.)^[119]

iii. Integrated Development Environment (IDE) Tools

- **Visual Studio Code**

Visual Studio Code provides a simple source code editor with powerful editor tools like intelliSense code completion and debugging. Visual Studio Code is available in macOS, Linux, and Windows. With the support of hundreds of programming languages, VS Code helps you be instantly productive with syntax highlighting, bracket-matching, auto-indentation, box-selection, and many more (Visual Studio Code, n.d)^[120].

iv. UML Creation Tools

- **Diagrams.net**

Previously called as draw.io, it is a highly useful free cross-platform diagramming application used for creating several types of diagrams such as UML, flowcharts, workcharts, org charts, wireframes, network diagrams, and every known diagrams that a person can come up with. It is highly simple to use with a responsive and quality interface with no limitations, no login, and no registration required. Diagrams created can be saved to your DropBow, Google Drive, Box, or OneDrive which can be exported directly for download on a computer. (Battersby, 2020)^[121]

v. Repository Version Control Tools

- **GitHub**

GitHub is a well-known free repository programming resource for code sharing online. It is used by thousands of companies and organizations for managing their software projects and for effective and efficient collaboration. It is mainly used for version control or source control in order to manage and track changes in a project's code and its sources. It is a highly useful tool for every programmer worldwide with its simple user interface design and its ability to accommodate programmer's need for effective cooperation. (Gaba, 2022)^[122]

vi. UI, Graphic, and Mock-Up Tools

- **MS PowerPoint**

Microsoft PowerPoint is a powerful slide presentation design tool for presenting business presentations, educational presentations, event and activity presentations, mock-ups designs, graphics, and outline presentations developed by Dennis Austin and Thomas Rudkin at Forethought Inc. in 1987, which was later bought by Microsoft. PowerPoint is saved as .pptx format, which can be exported as JPEG, PDF, GIF, PNG, or MPEG-4 files. (Techopedia, 2020)^[123]. Its slide designs can be creatively used to animate simple text and graphical images. It can also add 3D models for more engagement and inventiveness. PowerPoint also has powerful transitions such as Morph that can create slide-to-slide automatic animations through objects, text, shapes, and pictures. (Cartwright, 2022)^[124]

- **unDraw.co**

unDraw.co is an open-source illustrator for projects that contains free and picturesque SVG images with no royalties and attribution. unDraw is mainly used for designing websites, software products, and applications in the I.T. industry. It can customize colors automatically that match a company's brand identity. These designs can be used for normal image setting, embed code, or design workflows directly on the website. unDraw has useful technologies that make future-ready high-quality images with no degradation for its 6k quality. SVGs created on the website can be fully customized and have the ability to minimize its size based on the required project specifications. With that said, the website ultimately allows commercial and person use without attribution or costs. (Limpitsouni, 2022)^[125]

- **Font Awesome**

Font Awesome is a free CSS and HTML icon toolkit library that provides thousands of icons used by developers, content creators, and designers worldwide. The icon library currently has 16,083 pro icons, 2,009 free icons, 68 icon categories, and version 6.1.1 as its latest build and release. The icons can be customized and styled for any type of projects including a web project, mobile project, software project, and design projects that are used by millions of professionals around the globe. (Font Awesome, 2022)^[134]

Chapter 3: Technical Background

1. Requirement Analysis

a. Functional Requirements

i. User

This shows all required specifications needed for all operations and activities of the user.

- Must be able to register their personal account.
- Must be able to login on the website application.
- Must be able to reset password.
- Must be able to access mood diary to input the user's mood for the day.
- Must be able to view overall mood interpretation at the end of the day.
- Must be able to access automatic thought journal to input existing negative thoughts and ask users of their alternative thought, feelings, and resulting behavior .
- Must be able to view entered alternative behavior as a solution to the triggering event.

ii. Administrator

This shows all required specifications needed for all operations and activities of the administrator:

- Must be able to login on the website application
- Must be able to create user accounts.

- Must be able to manage user accounts.
- Must be able to manage database records.

b. Non-Functional Requirements

i. Security

The system should handle data and personal information privately and with the utmost confidentiality. Furthermore, the system must be able to keep records of the mood privately and with the user's authority only. In addition, the data and resources of the system must be protected from possible vulnerabilities and intruders such as hackers and identity thieves.

The following are the possible security handling of the system:

- Must have a login feature that requires the user to provide an email address and a password.
- Must be able to confirm the user's identity through sending an email confirmation.

ii. Reliability

The system should be able to handle unexpected changes on the system (such as errors) to remain reliable without sacrificing its core functionality. Additionally, system data should be persistent enough to last permanently throughout its lifetime despite these changes. There will be a total of three reports to maintain system reliability:

- **Mood Diary Report**

To notify and track user's changes in their mood diary, the system will generate a status report when saving and adding their daily mood input.

- **Automatic Thought Journal**

To notify and track user's updates in their automatic thought journal, the system will generate a report when saving and adding their daily input for their journal.

iii. **Usability**

- For learnability, the system will do the following:

- The simplicity of language to accommodate user-friendliness
- Easy-to-use user interface design
- Guide section to accommodate users

- For efficiency, the system will do the following:

- Straightforward UI design for users to perform their tasks efficiently and effectively, taking less time for them to accomplish their tasks.
- Enhance its user experience through fast and reliable system speed through structured and orderly program code.

- For memorability, the system will be designed uniquely, allowing users to memorize and to easily remember the system through engaging and distinctive UI design.

- For error checking, the system will do the following:
 - The system must monitor all the data coming from the user.
 - The system must be able to keep track of the user's mood input that is done through the web application.
 - The system must be able to keep track of the user's Automatic Thought Journal input.
 - The system must be able to interpret the inputted mood data effectively.
- For satisfaction, the system will design reward system messages when users accomplish their tasks, allowing satisfaction and enhanced user experience.

c. Software Requirements

i. Front End

- HTML
- CSS
- Bootstrap

ii. Back End

- JavaScript
- Firebase Database

2. Software Development Life Cycle (SDLC) Model

The project will be utilizing the **Waterfall Model** as its SDLC modeling process. The Waterfall model is one of the highly used and universal life cycle models for software development in software engineering. It was developed by Winston Royce in the year 1970 and has become a staple model in the industry, pioneering and inspiring the creation of other SDLC models, such as the Spiral Model (W3Schools, n.d.)^[126]. The model is also called a linear-sequential life cycle model due to its straightforward nature: when one phase ends, the next phase begins. Hence, the term “waterfall” was used to describe this precise process — “once water falls down, it cannot go back up” (Conrad, 2011)^[127]. These phases are divided into six, which are described in the following (Tutorialspoint)^[128]:

- **Requirements** – In this phase, the system requirements and analysis are conducted for the purpose of project specifications and documentation.
- **Design** – In this phase, the system design will be developed, architecting the system based on the provided specifications and requirements from the previous phase. This includes the creation of Unified Modeling Language (UML) designs such as Use Case Diagram (UCD), Activity Diagram, and Class Diagrams as a few examples.
- **Development** – In this phase, the actual development of software starts to take place, implementing the system designs provided from the previous phase. The project will be separated into units of releases of small programs, which will be tested in the next phase for Unit Testing.
- **Testing** – In this phase, integration and testing will be performed for quality assurance, testing the system for any errors and faults.

- **Deployment** – In this phase, the system will be ready for release in the market for customer and consumer use.
- **Maintenance** – In this phase, the system will implement maintenances if issues are found in the client environment. As a result, patches are released to enhance the quality of the system.

With that said, the Waterfall model must be used when the following criteria are met: (a) not frequently changing requirements; (b) small projects and small applications; (c) requirements should be documented well; (d) static tools and technologies; and (e) stable environment. Its main advantage is its simplicity and favors great results for static smaller projects. However, its main disadvantage is its inability to accommodate changes. (SoftwareTestingHelp, 2022)^[129]

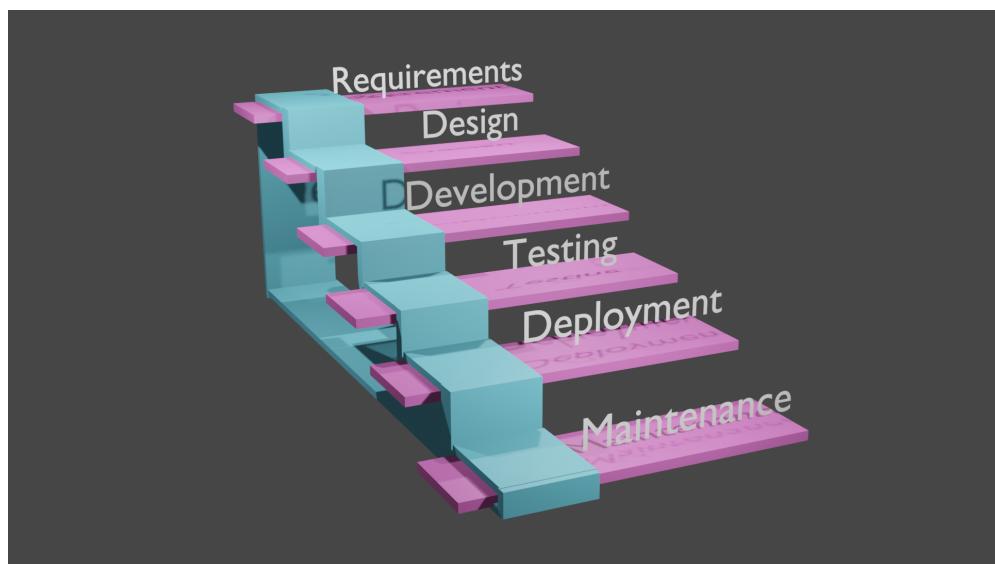


Figure 3.2.1 Waterfall SDLC Model

Figure 3.2.1 shows the Waterfall SDLC modeling process of the system. The researchers of this study utilized the Waterfall Model as its Software Development Life Cycle Model because of the fixed requirements and design of this project have been stated clearly. As a matter of fact, the technology of this project is static and well-understood. Uniquely, the requirements of

this project are also not ambiguous and complex to handle. Additionally, having enough technical resources and ample expertise is available to support this technology. It is also equally important to know that this project is simple and short. The researchers also see the advantages of this SDLC Model. First, this SDLC Model is very simple and easy to understand and to use due to its linear-sequential process. Second, it is easy to manage because of the Model's inability to be changed. Third, the phases of this SDLC model are completed and done one at a time. Fourth, this SDLC Model works well for small projects that have clear and fixed requirements. Fifth, this SDLC Model has clear and well-defined stages. Lastly, in this SDLC Model, it is easy to arrange tasks and the process of this Model is well documented.

To provide further explanation, the Waterfall Model widely prefers smaller unchanging projects such as the MTEJ due to its well-identified and documented project requirements and specifications for development. The MTEJ will not conduct any changes in its system after deployment, except for system maintenance for customer environment errors and patches specifically catered for bug fixes and enhancing system performance. Moreover, the MTEJ system will also not be changing any of its implemented tools and technologies used during and after development, impounding on itself to commit to its static technologies. Additionally, the MTEJ will not be a long and ongoing project. Once it is done and a number of maintenance has been completed, the project will have its final patch and final working version for customers to use as a generic software development system. In conclusion, the Waterfall model best suits the system design of the MTEJ program as its SDLC model primarily due to the four major factors: (1) fixed project requirements and specifications; (2) static and unchanging system; (3) small and is not an on-going long-term project; and a (4) straightforward model.

3. Research Methodologies

- Secondary Data Analysis
 - For the research methodology, the researchers utilized the secondary data analysis to gather resources and statistics related to mood and mental health along with its effects among individual's overall well being and therapeutic interventions and techniques. Moreover, the gathered data also focuses on the advantages and disadvantages of making use of mood-monitoring and journal applications to determine the benefits that the study may bring upon monitoring mental health care.

4. System Design

a. Use Case Diagram

The Use Case Diagram (UCD) is a Unified Modeling Language (UML) design used to summarize and to synopsize the system. It comprises two major components, the actor and the system. The UCD significantly shows how the actor interacts with the system of the software. These will be done through symbols and connectors to help represent the two components (Lucidchart, n.d.)^[130]. Furthermore, according to TutorialsPoint (n.d.)^[131], UCD is a high-level design used to model a system. It can capture a system's important design aspects in order to understand its development design and dynamic behavior when running and operating. The purpose of UCD are the following:

- To gather the requirements of a system
- To provide a outside view of the system
- To identify factors that influences the system
- To show interaction between the system and its actors

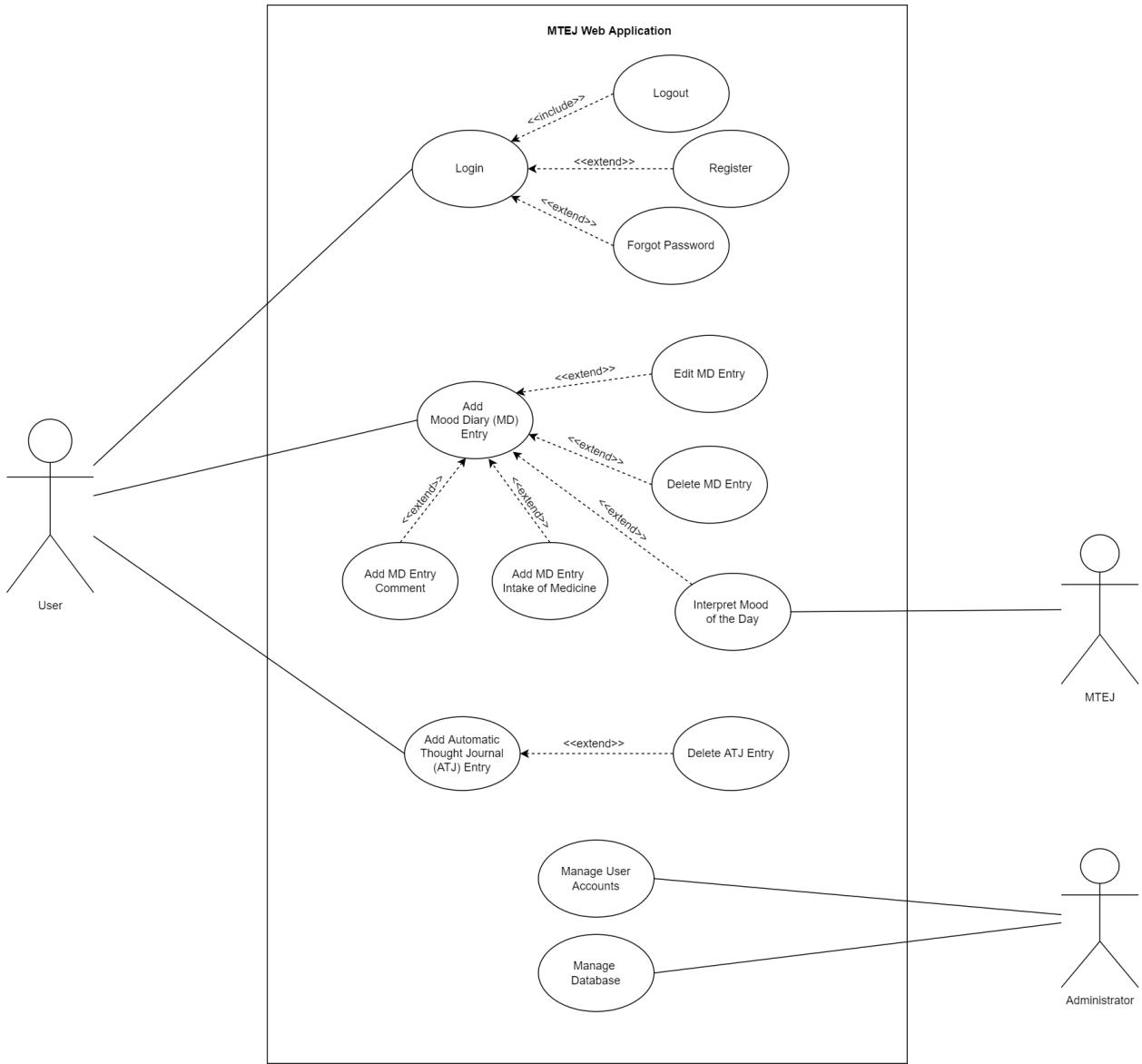


Figure 3.4.1 MTEJ Use Case Diagram Model

Figure 3.4.1 shows the Use Case Diagram model of the MTEJ: Mood Therapy Electronic Journal (Filipino Version)'s. The system is separated into five development releases in order of importance and development priority. The following are the in-depth features of the model:

- i. Contains features for creating an account
 - User can register an account
 - User can login on the account

- User can log out on the account
 - User can access forget password
- ii. Contains features of the Mood Diary of the system
- User can add a mood entry
 - User can edit their mood entry
 - User can delete their mood entry
- iii. Contains features for the Automatic Thought Journal (ATJ)
- User can add entry for Automatic Thought Journal (ATJ)
 - User can delete their ATJ entry
 - User can add entry for alternative thought, feeling, & behavior
- iv. Contains optional features of the system
- User can add optional mood entry comment
 - User can add optional mood entry intake of medicine
- v. Contains system interpretation of data
- Mood Diary can interpret overall mood of the day
 - Mood Diary can interpret overall mood of the week
 - Mood Diary can interpret overall mood of the month
- vi. Contains administrator roles on the system
- Administrator can manage user accounts
 - Administrator can manage database

b. **Use Case Narrative**

MTEJ - 01

Title: Login

Summary: The user will login into their personal account to gain access to the website

Actors: General user

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Iyanla Angeli L. Sosa

Flow of Events

Pre-conditions:

1. The user must have access to the internet.
2. The user must have their own personal computer/laptop/mobile device with an installed browser.
3. The user must have a registered account.
4. The user inputs proper login credentials.

Main Success Scenario:

1. The user will access the website through its address using a browser's search engine.
2. The website will load and direct the user to the login page.
3. The user will click on the login hyperlink.
4. The user will enter the necessary login credentials:
 - a. Email
 - b. Password
5. After login, the user will be redirected to the website's homepage / main page.

Alternative Sequence:

A01. The user does not have a registered account.

1. The user will click the "register" hyperlink and proceed to the account registration.

Error Sequence:

E01. The user attempts to log in during an internet connection lost.

1. A system error message will be displayed.

E01.4 The user left a field blank.

1. A system error message will be displayed.

E01.4a The user inputted an unrecognized email address.

1. A system error message will be displayed.

E01.4b The user inputs invalid password.

1. A system error message will be displayed.

Post Conditions:

1. The user has successfully accessed the website.

MTEJ - 02

Title: Logout

Summary: The user will log out of their account

Actors: General User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Iyanla Angeli L. Sosa

Flow of Events

Pre-conditions:

1. The user must have access to the internet.
2. The user must have an account and is successfully logged in to the system.

Main Success Scenario:

1. The user is on the homepage / main page of the website.
2. The user clicks the sign out button on the upper right of the homepage.

Alternative Sequence:

A02. The user decides to cancel logout.

1. The user may not click on the sign out button and will remain on the homepage of the website.

Error Sequence:

E02. The user attempts to logout during an internet connection lost.

1. A logout error message will be displayed.

Post Conditions:

1. The user has successfully logged out of their account.

MTEJ - 03

Title: Register

Summary: The user will create an account to gain access to the website application

Actors: General User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Iyanla Angeli L. Sosa

Flow of Events

Pre-conditions:

1. The user must have access to the internet.
2. The user must have their own personal computer/ laptop/ mobile device with an installed browser.
3. The user must access the website through its address using a browser's search engine.
4. The user must have prepared required information needed upon creating an account.

Main Success Scenario:

1. The user accesses the website by typing in the address in the address bar.
2. The website will load and the sign up page form will appear.
3. The user will click the sign up hyperlink.
4. The user will input needed personal information to create their personal account:
 - a. Email
 - b. Password
5. After signing up, a verification email will be sent to the user's email address.
6. The user will then be redirected to the home page / web page of the website.
7. The user may now set their first and last name for their profile.

Alternative Sequence:

A03.4 The user decides to cancel registration

1. The user will be redirected on the login page of the website

Error Sequence:

E03. The user is signing up during an internet connection lost.

1. A system error message will be displayed

E03.4 The user left a field blank

1. A system error message will be displayed

E03.4a,4b. The user did not follow proper field format

1. A system error message will be displayed

E03.4a. Email has already been used

1. A system error message will be displayed

E03.4b. The user has inputted a weak password

1. A system error message will be displayed

E03.7. The user did not input the first and last name for the profile

1. A system error message will be displayed

Post Conditions:

2. The user account is created.
3. The user database has been updated.

MTEJ - 04

Title: Forgot Password

Summary: The user can renew password when current password is forgotten

Actors: General User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Iyanla Angeli L. Sosa

Flow of Events

Pre-conditions:

1. The user must have access to the internet.
2. The user must have a registered account.
3. The user inputs a valid email address.

Main Success Scenario:

1. The user will access the website through its address using a browser's search engine.
2. The website will load and direct the user to the login page.
3. The user will click on the login hyperlink.
4. The user may click the "forgot password" hyperlink.
5. The user will enter the used email address for their personal account.
6. The user will click the link inside the email sent by the system.
7. The user will enter a new password.
8. The user will confirm the new password.

Alternative Sequence:

A04. The user decides to cancel inputting the forgotten password.

1. The user will be redirected to the login page of the website by pressing "cancel" hyperlink.

Error Sequence:

E04. The user is signing up during an internet connection lost.

1. A system error message will be displayed

E04. The user left a field blank.

1. A system error message will be displayed.

E04. The user did not follow proper field format

1. A system error message will be displayed.

E04.5 The user inputs an unrecognized email address.

1. A system error message will be displayed

E04.7 The user input a weak password.

1. A system error message will be displayed

E04.8 The user inputs the wrong password for the confirmation password.

1. A system error message will be displayed

Post Conditions:

1. The user has successfully changed their password.
2. The password database has been updated.

MTEJ - 05

Title: Add Mood Diary (MD) Entry

Summary: The user will add an entry for the Mood Diary feature

Actors: User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Karl John M. Punzalan

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. The user must go to the mood diary section of the website.
2. The user must click the "add" button in order to create a mood diary entry.
3. The user must choose their current mood level for the day under the following:
 - a. Elevated Mood: Severe, Moderate, or Mild
 - b. Normal Mood: Normal
 - c. Depressed Mood: Mild, Moderate, or Severe
4. The user must save their mood diary entry after choosing their mood level.

Alternative Sequence:

A3. The user decides to cancel the mood entry during selection of mood level.

1. The user will be redirected to the mood diary section of the website.

A4. The user decides to cancel adding a mood diary entry.

1. The user will be redirected to the mood diary section of the website.

Error Sequence:

E4. The user enters an entry for the mood diary during an internet connection lost.

1. A system error message will be displayed.

Post Conditions:

1. Mood diary entry is created.
2. Mood diary entry is saved on the database.

MTEJ - 06

Title: Edit MD Entry

Summary: The user will edit a currently existing Mood Diary entry.

Actors: User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Karl John M. Punzalan

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.
5. The user must have an existing mood diary entry to edit.

Main Success Scenario:

1. The user must go to the mood diary section of the website.
2. The user must click on an existing mood diary entry to view its details.
3. The user must click "edit" on the existing mood diary entry to edit.
4. The user must choose to edit their current mood level for the day under the following:
 - a. Elevated Mood: Severe, Moderate, or Mild
 - b. Normal Mood: Normal
 - c. Depressed Mood: Mild, Moderate, or Severe
5. The user must save their mood diary entry after editing their mood level.

Alternative Sequence:

A4. The user decides to cancel editing their entry during selection of mood level.

1. The user will be redirected to the mood diary section of the website.

A5. The user decides to cancel adding a mood diary entry.

1. The user will be redirected to the mood diary section of the website.

Error Sequence:

E5. The user edits an entry during an internet connection lost.

1. A system error message will be displayed.

Post Conditions:

1. Mood entry is edited.
2. Mood entry is updated on the database.

MTEJ - 07

Title: Delete MD Entry

Summary: The user will delete a currently existing Mood Diary entry.

Actors: User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Karl John M. Punzalan

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.
5. The user must have an existing mood diary entry to delete.

Main Success Scenario:

1. The user must go to the mood diary section of the website.
2. The user must click on an existing mood diary entry to view its details.
3. The user must click "delete" on the existing mood diary entry to delete.
4. The user must confirm deletion of mood diary entry.

Alternative Sequence:

A3. The user decides to go back to the mood diary section.

1. The user will be redirected to the mood diary section of the website.

A4. The user decides to cancel deletion of mood diary entry.

2. The user will be redirected to the mood diary section of the website.

Error Sequence:

E4. The user deletes an entry during an internet connection lost.

1. A system error message will be displayed.

Post Conditions:

1. Mood entry is deleted.
2. Mood entry is removed from the database.

MTEJ - 08

Title: Add MD Entry Comment

Summary: The user adds an optional comment upon creation of their mood entry.

Actors: User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Karl John M. Punzalan

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. The user goes to the mood diary section of the website.
2. The user clicks the "add" button in order to create a mood diary entry.
3. The user must choose their current mood level for the day under the following:
 - a. Elevated Mood: Severe, Moderate, or Mild
 - b. Normal Mood: Normal
 - c. Depressed Mood: Mild, Moderate, or Severe
4. The user writes their comment on the comment text area.
5. The user saves their mood diary entry after choosing their mood level.

Alternative Sequence:

- A1. The user decides to add a comment to an already existing mood entry.
1. The user must click on an existing mood diary entry to view its details.
 2. The user must click "edit" on the existing mood diary entry to edit.
 3. The user writes their comment on the comment text area.

4. The user must save their mood diary entry after editing and writing a comment on an already existing mood entry.

A3. The user decides to cancel the mood entry during selection of mood level.

1. The user will be redirected to the mood diary section of the website.

A4. The user decides to remove all written comments.

A4a. The user decides to continue adding mood entries.

1. The user saves their mood diary entry after choosing their mood level.

A4b. The user decides to cancel the entry after removing written comments.

1. The user will be redirected to the mood diary section of the website.

A5. The user decides to cancel adding a mood diary entry.

1. The user will be redirected to the mood diary section of the website.

Error Sequence:

E5. The user saves an entry during an internet connection lost.

1. A system error message will be displayed.

Post Conditions:

1. A mood diary entry is created.
2. A mood diary entry comment is saved on the database.

MTEJ - 09

Title: Add Automatic Thought Journal (ATJ) Entry

Summary: The user may add an Automatic Thought Journal entry in the web application.

Actors: User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Denise Ysabelle M. Areza

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. The user will choose to click the button for entering an entry for Automatic Thought Journal.
2. The user will read a specific question regarding his or her triggering event.
3. The user enters his or her triggering event in a text area.
4. The user will read a specific question regarding his or her automatic thoughts.
5. The user enters his or her automatic thoughts in a text area.
6. The user will read a specific question regarding his or her automatic feelings.
7. The user enters his or her automatic feelings in a text area.
8. The user will read a specific question regarding his or her automatic behavior.
9. The user enters his or her automatic behavior in a text area.
10. The user will read a specific question regarding his or her alternative thoughts, alternative feelings, and alternative behavior.
11. The user enters his or her alternative thoughts, alternative feelings, and alternative behavior.

Alternative Sequence:

- A09. The user did not continue in entering input for Automatic Thought Journal.
1. The user may click the “cancel” button displayed on the screen.
 2. The user will be redirected to the homepage.

Error Sequence:

- E09.3. No triggering event was entered.
1. A system error will be displayed.
- E09.5. No automatic thoughts were entered.
1. A system error will be displayed.
- E09.7. No automatic feelings were entered.
1. A system error will be displayed.
- E09.9. No automatic behavior was entered.
1. A system error will be displayed.
- E09.11. No entered alternative thoughts, feelings, and alternative behavior.
1. A system error will be displayed.

Post Conditions:

1. The user can now view his or her alternative behavior and will serve as his or her reminder.

MTEJ - 10

Title: Delete Automatic Thought Journal (ATJ) Entry

Summary: The user may delete an Automatic Thought Journal entry in the web application.

Actors: User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Denise Ysabelle M. Areza

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. The user will proceed to his or her Automatic Thought Journal page.
2. The user will select an Automatic Thought Journal entry to delete.
3. The user will now click the "delete" button.

Alternative Sequence:

- A10. The user accidentally clicked the "delete" button.
1. The user will receive a confirmation whether he or she will proceed to the deletion of the entry.

Error Sequence:

- E10.3. No selected entry is to be deleted.
2. A system error will be displayed.

Post Conditions:

1. The user has deleted some of his or her Automatic Thought Journal entries.

MTEJ - 11

Title: Add Mood Diary Entry Intake of Medicine

Summary: The user may add his or her intake of medicine.

Actors: User

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Denise Ysabelle M. Areza

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. The user will select a specific mood journal entry.
2. The user may choose the option where it says "Input Medicine Intake"
3. The user may enter the medicine that he or she took for that day.
4. The user may now save the changes.

Alternative Sequence:

- A11. The user did not enter any input and clicked the "save" button.
1. The user will receive a warning that he or she did not enter any input.
 2. The user will be redirected to the selected mood diary entry.

Error Sequence:

- E11.3. No input for medicine intake.
1. A warning will be displayed

Post Conditions:

1. The user added medicine intake as a piece of additional information.

MTEJ - 12

Title: Interpret Mood of the Day

Summary: MTEJ will interpret the entered mood/s for that day.

Actors: MTEJ

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Denise Ysabelle M. Areza

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. MTEJ will start to count the number of severely elevated mood, moderately elevated mood, mildly elevated mood, normal mood, severely depressed mood, moderately depressed mood, and mildly depressed mood selected by the user on that day.
2. MTEJ will show the number of moods selected:
 - a. MTEJ will show the most selected mood.
 - b. MTEJ will show the least selected mood.
3. MTEJ will report the interpretation on the homepage of the website.

Alternative Sequence:

A12. MTEJ did not detect any selected moods.

1. MTEJ will still report that the user did not select any mood for that day.

Error Sequence:

E12.1. MTEJ has nothing to count.

1. A warning will be displayed.
2. A reminder to the user will be sent.

Post Conditions:

1. MTEJ will now interpret the entered mood/s of the day.

MTEJ - 13

Title: Manage User Accounts

Summary: The administrator will manage user accounts from the database.

Actors: Administrator

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Denise Ysabelle M. Areza

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. The administrator can view all users from the database.
2. The administrator can delete some users from the database.

Alternative Sequence:

- A13. The administrator deleted a user from the database.
1. The system will ask the administrator if he or she is sure to delete the user.

Error Sequence:

- E13.1. If there are no active users
1. A warning will be displayed that there are no active users.

Post Conditions:

1. The administrator can now view and delete active users from the database.

MTEJ - 14

Title: Manage Database

Summary: The administrator will view, and delete mood entries from the database.

Actors: Administrator

Creation Date: March 24, 2022

Date of Update: March 26, 2022

Version: v1.0

Person in Charge: Denise Ysabelle M. Areza

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged in to the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. The administrator can view all mood entries of all active users.
2. The administrator can delete some mood entries of active users.

Alternative Sequence:

- A14. The administrator deleted a mood entry from the database.
 2. The system will ask the administrator if he or she is sure to delete the mood entry.

Error Sequence:

- E14.1. If there are no mood entries added.
 1. A warning will be displayed.

Post Conditions:

1. The administrator can now view and delete mood entries of active users.

c. Screen Layout (Prototype)

The provisional layout design for the MTEJ prototype screen layouts of the system will be designed for a total of 7 layouts, these will be the following: (1) Login, (2) Register, (3) Forgot Your Password, (4) Home Page, (5) About Us Page, (6) Mood Diary, and the (7) Automatic Thought Journal layout designs. These layouts will be mainly used and viewed by the users of the system. On the other hand, there are two layouts for the administrators of the system, which will not be visible to the users. These 2 layouts are the (1) Manage Mood Diary layout, and the (2) Manage Users layout.

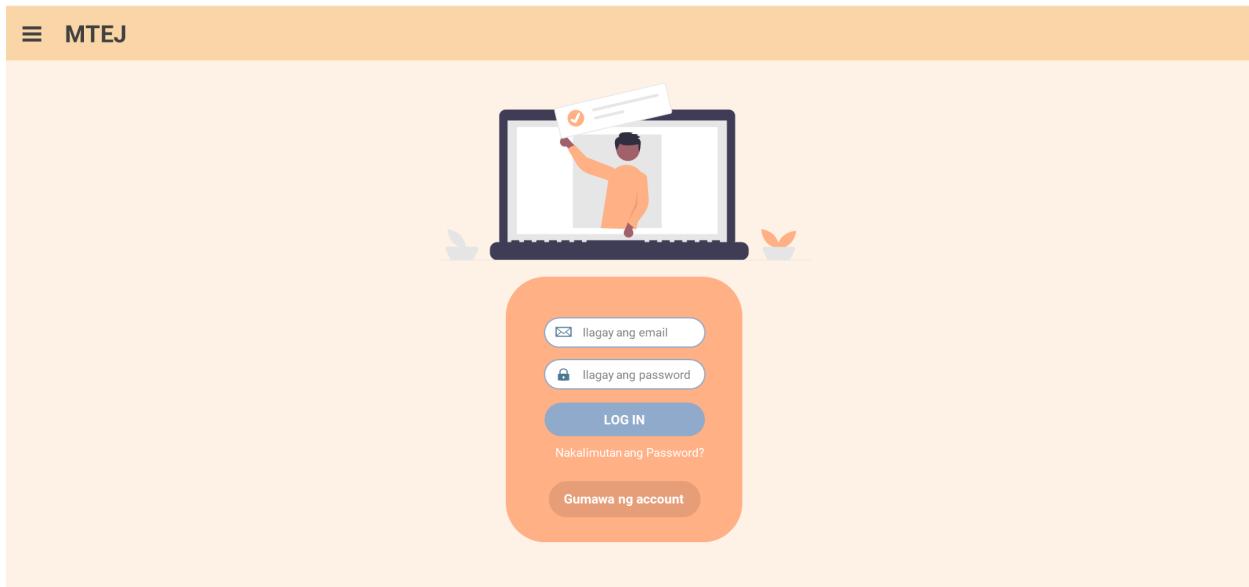


Figure 3.4.c.1 Login

The log in page requires the user to input their email address and password and after successfully filing in the required credentials, the user will be redirected to the website's home page. If the user has not yet registered a personal account, they may click on the “Wala pang account? Mag-Register!” hyperlink which would redirect them to the registration page.

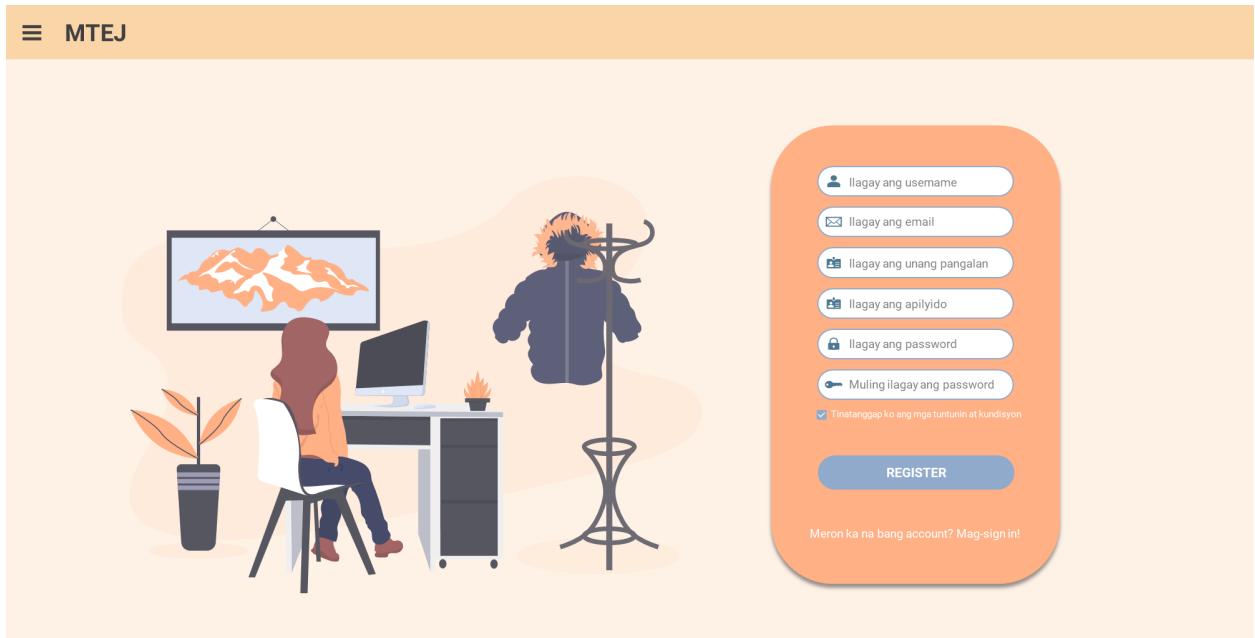


Figure 3.4.c.2 Register

Another feature that the user can do is the ability to register on the system. Figure 3.4.c.2 shows the registration layout of the website. A successful registration will be done through user input for the following: (1) username, (2) email, (3) first name, (4) last name, (5) password, and (6) password confirmation. After doing so, the user is required to click on the “Tinatanggap ko ang mga tuntunin at kundisyon” for confirmation of the system’s terms and conditions. However, if the user already has an account, an additional option for them is to choose “Meron ka na bang account? Mag-sign in!” which will redirect the user on the login feature of the system. After the user clicks on the “Register” button, an email confirmation will be sent on their respective email services (such as Gmail). If the user confirms registration on their email account, they will now become a fully registered user of the MTEJ system, allowing them to use the two main features of the system, (1) the mood diary feature, and the (2) automatic thought journaling feature.

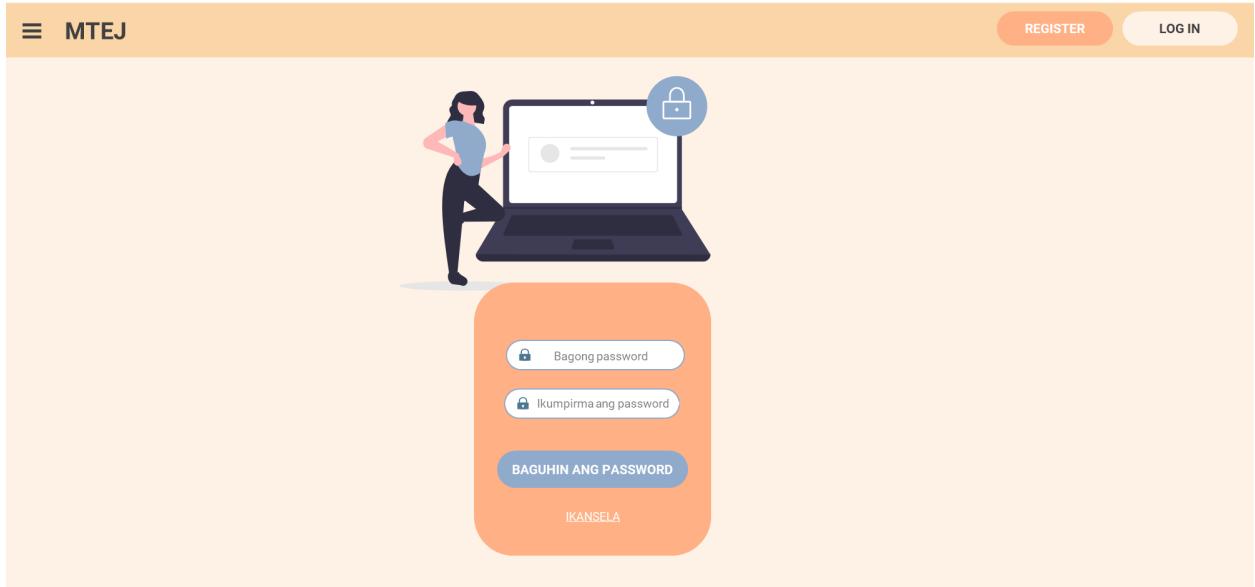


Figure 3.4.c.3 Forgot Your Password

After inputting their email address and receiving a verification email from the system, the user will be redirected to the current page shown in Figure 3.4.c.3 wherein the user may input their new password in the “Bagong password” field and re-confirm password in the “Ikumpirma ang password” field and finish by clicking the “Baguhin ang Password” button. If the user chooses to cancel the procedure, they may click on the “Ikansela” hyperlink to redirect them back to the home page.

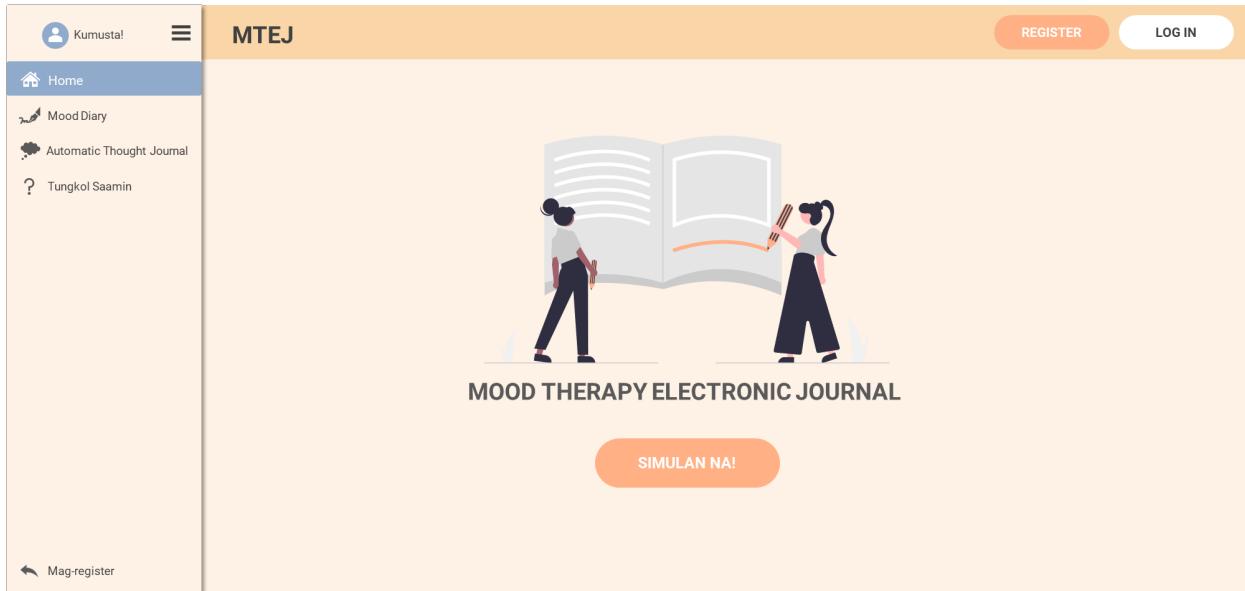


Figure 3.4.c.4 Home Page

Upon first accessing the website, the user may choose to register and create their personal accounts by clicking the “register” hyperlink and will be redirected to the registration page. If the user already has an account, the user may choose to log in using their email and password which redirects them to the website’s homepage. The user may also access other features of the website on the sidebar such as the about us or “Tungkol Sa Amin” page, and may only access the mood diary page, automatic thought journal page once successfully registered and logged in.

Figure 3.4.c.5 About Us Page

Figure 3.4.c.5 shows a partial layout of the “About Us” page of the website. This is an essential page for the website to provide information regarding the researchers and the developers of the system. This will contain necessary business information such as (1) their story, (2) how they started, (3) the developers, (4) their mission and vision, and (5) why they created the MTEJ system.

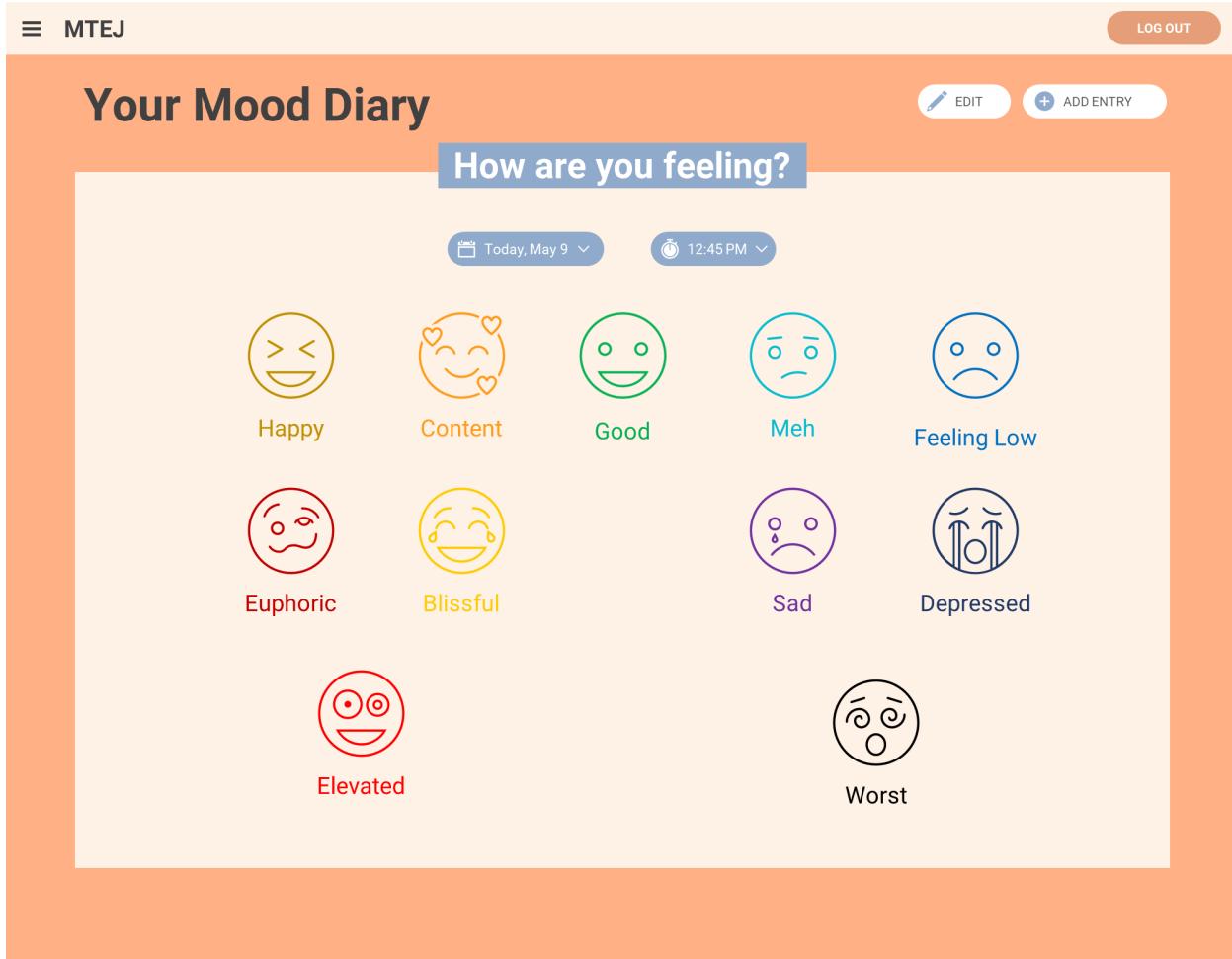


Figure 3.4.c.6 Mood Diary (Add Entry)

Figure 3.4.c.6 shows a partial layout for the mood diary feature. As shown above, this layout will appear when the user adds an entry to their mood diary. The date and time will automatically be filled by the system based on the user's date and time on their respective devices. They can also choose to edit the date and time if intended. After that, they will be asked to choose the following mood from severe elevated to severe depressed: (1) elevated, (2) euphoric, (3) blissful, (4) happy, (5) content, (6) good, (7) meh, (8) feeling low, (9) sad, (10) depressed, (11) worst. The page will also include an “Edit” button for editing a mood entry as well as an “Add Entry” button which will add an additional mood entry for the user.

Your Mood Diary

May 2022

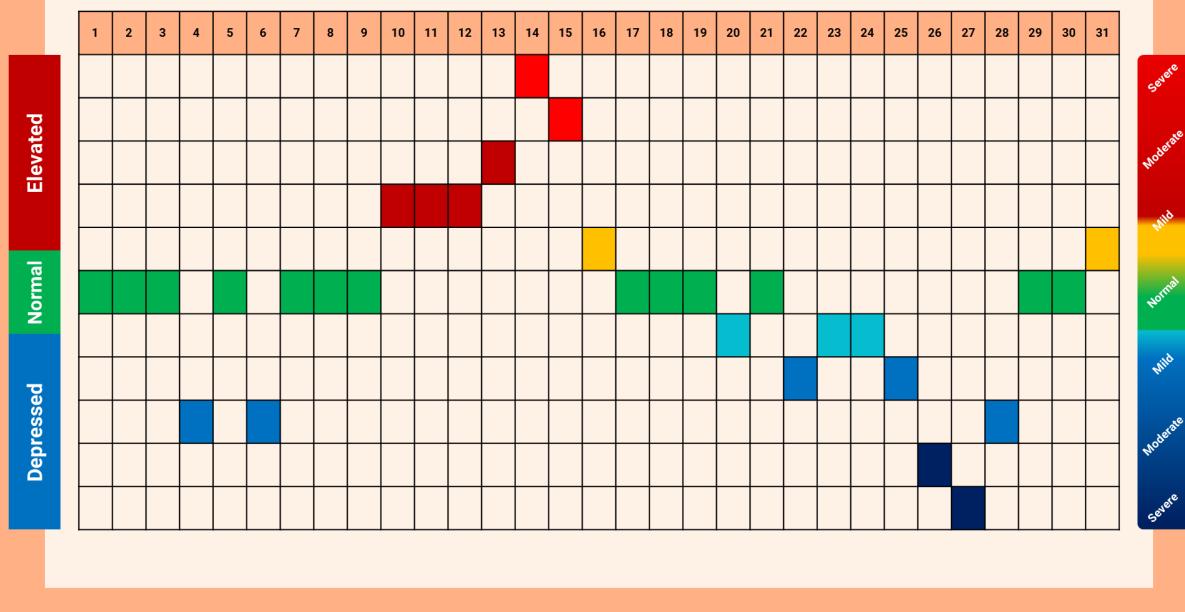


Figure 3.4.c.7 Mood Diary (Progress)

Figure 3.4.c.7 is the partial layout for the mood diary progress system of the website.

This will contain a daily progress bar for the user which will appear in a monthly calendar. This will show the user's mood for every day of the month, which ranges from depressed, to normal, to elevated (manic). As previously shown in Figure 3.4.c.6 on the "Add Entry" feature, each mood will represent the following: (1) depressed mood - mild, moderate, and severely depressed; (2) normal mood; (3) elevated mood - mild, moderate, and severe elevated. This will also contain the "edit" button for editing a mood entry, and the "add entry" button for adding an additional mood entry for the day. When a user adds multiple entries in one day, these entries will average each other and will color the appropriate mood level of the day.

Automatic Thought Journal

SUBMIT

CANCEL

Date	Triggering Event	Automatic Thought	Automatic Feeling	Resulting Behavior	Manifestation
MM/DD/YY	QUESTION	QUESTION	QUESTION	QUESTION	QUESTION
	✍	✍	✍	✍	✍

Figure 3.4.c.8 Automatic Thought Journal

Figure 3.4.c.8 illustrates the automatic thought journal where the upper rows consist of questions relevant to the categories for the (1) triggering event, (2) automatic thought, (3) automatic feeling, (4) resulting behavior, (5)manifestation. The date is automatically inputted by the system, while the user may input their answers on the bottom text fields. Once the user is done with their inputs, they may now click on the “submit” button to record their entries, they may also choose to cancel their inputs and no records would be saved.

Mood ID	User ID	Date	Time	Mood Level	Action
M00341	U00054	May 8	12:45 PM	Normal	<button>Edit</button> <button>Delete</button>
M00342	U00675	May 8	12:45 PM	Mild Elevated	<button>Edit</button> <button>Delete</button>
M00344	U03413	May 8	12:46 PM	Normal	<button>Edit</button> <button>Delete</button>
M00345	U00194	May 8	12:46 PM	Moderately Depressed	<button>Edit</button> <button>Delete</button>
M00346	U00443	May 8	12:46 PM	Severe Elevated	<button>Edit</button> <button>Delete</button>
M00347	U00657	May 8	12:47 PM	Mild Depressed	<button>Edit</button> <button>Delete</button>

Figure 3.4.c.9 [Admin] Manage Mood Diary

For admin functionality, administrators can manage the mood diary of the user. This will show a tabulated version of the mood diary's database that shows the following data:

- (1) Mood ID - data for the Mood ID of every created mood entries
- (2) User ID - the User ID of the users
- (3) Date - the date of the created mood diary entry
- (4) Time - the time of the user's current mood in their entry

Two action buttons will also be present, the first one is the “edit” button used to edit the mood entry data. On the other hand, there is also a “delete” button used to delete the data of the user. Overall, this is the layout for managing the mood diary entries of the user.

The screenshot shows the 'Manage Users' page under the 'Admin' section of the MTEJ application. The left sidebar includes links for Dashboard, Manage Users (which is selected and highlighted in blue), and Manage Mood Diary. The main content area has a header 'Manage Users' and a search bar. Below is a table listing six users:

Email	Password	Username	Action
lenirose@yahoo.com	*****	Leni Rosas	<button>View</button> <button>Delete</button>
aicapink@yahoo.com	*****	Aica Pink	<button>View</button> <button>Delete</button>
tricialoves@yahoo.com	*****	Tricia Loves	<button>View</button> <button>Delete</button>
jillianswift@yahoo.com	*****	Jillian Swift	<button>View</button> <button>Delete</button>
kikogreen@yahoo.com	*****	Kiko Green	<button>View</button> <button>Delete</button>
chelLaban@yahoo.com	*****	Chel Laban	<button>View</button> <button>Delete</button>

Figure 3.4.c.11 [Admin] Manage Users

For admin functionality, administrators can manage users registered in the system by viewing and deleting the active accounts in the database which can be accessed by the two buttons . This will show a tabulated record of the users information which consists of the following:

- (1) Email - user's personal email.
- (2) Password - secured password for the account.
- (3) Username - user's first and last name.

Chapter 4

a. Use Case Diagram

The Use Case Diagram (UCD) is a Unified Modeling Language (UML) design used to summarize and to synopsize the system. The following diagram are the changes that occurred upon development of the MTEJ project.

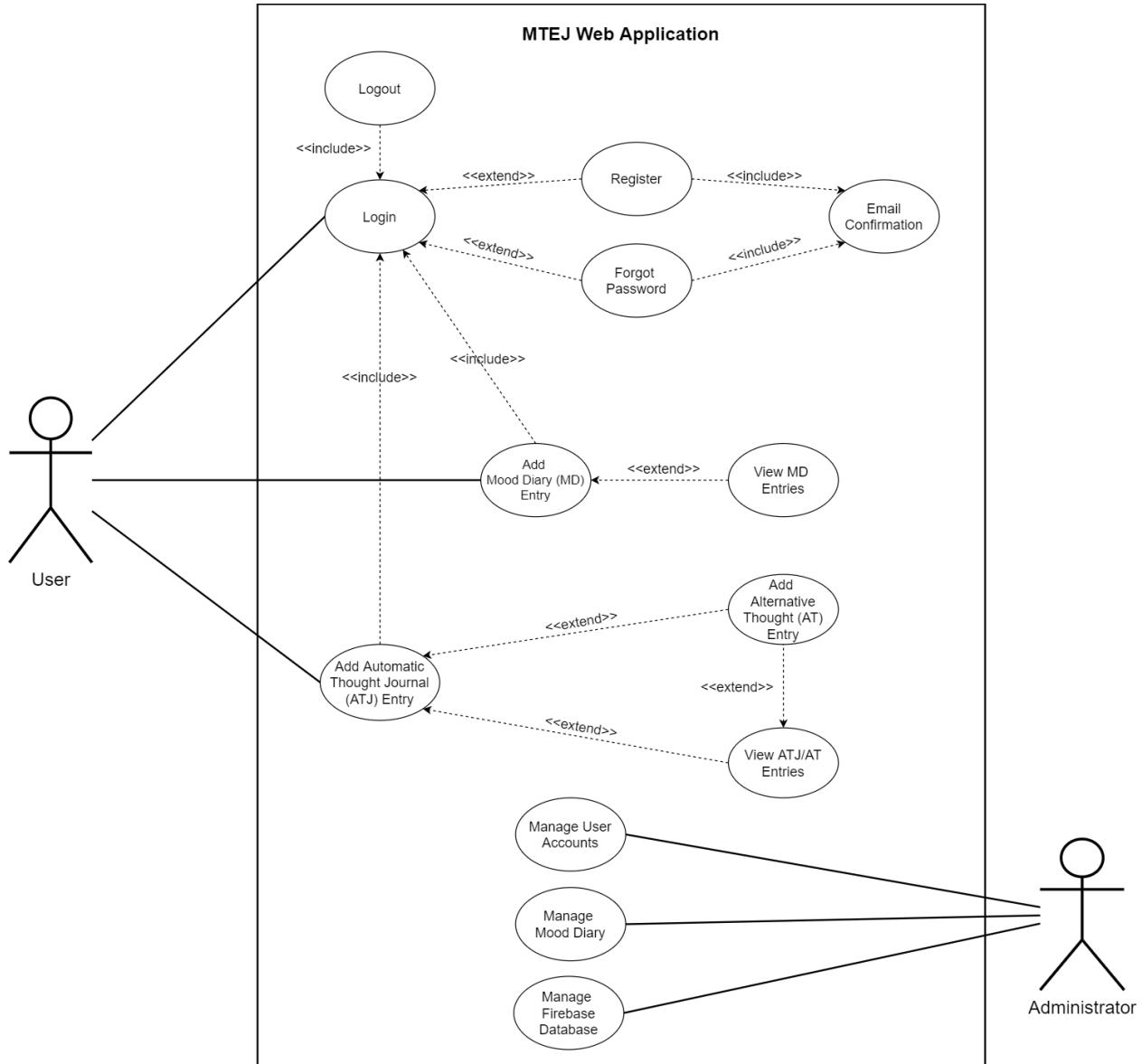


Figure 4.0 MTEJ Use Case Diagram Model

Figure 4.0 shows the Use Case Diagram model of the MTEJ: Mood Therapy Electronic Journal (Filipino Version)'s. As shown in the Figure, the use case diagram model has arrows with the “extends” and “includes” labels. To provide explanation, an arrow with the “<<include>>” label means that the base use case cannot proceed, being incomplete without the behavior of the including use case. Basically, the base use case is dependent on the including use case to function. On the other hand, an arrow with the “<<extend>>” label means that the base use case is simply an optional feature independent of the extending case. This means that the extending use case is independent and does not need the base use case to function.

The following are the explanation of the the system as shown in Figure 4.0:

- i. User can “Login” on the system.
 - **[extends to itself]** User can “Register” optionally.
 - **[includes to Email Confirmation]** User needs to do “Email Confirmation” during registration as a requirement.
 - **[extends to itself]** User can do “Forget Password” optionally.
 - **[includes to Email Confirmation]** User needs to do “Email Confirmation” during registration as a requirement.
 - **[includes to itself]** User can “Logout” on the system but logging in is required before logging out.
 - **[includes to itself]** User can “Add Mood Diary (MD) Entry” but logging in is required before interaction with the feature.
 - **[includes to itself]** User can “Add Automatic Thought Journal (ATJ) Entry” but logging in is required before interaction with the feature.

- ii. User can “Add Mood Diary (MD) Entry” on the system.
 - **[extends to itself]** User can “View MD Entries” optionally.
 - **[includes to Login]** User should be logged in as a requirement before the user can use the feature.
- iii. User can “Add Automatic Thought Journal (ATJ) Entry” on the system.
 - **[extends to itself]** User can “Add Alternative Thought (AT) Entry” as an optional feature.
 - **[extends to itself]** User can “View ATJ/AT Entries” optionally.
 - **[extends to itself]** User can “View ATJ/AT Entries” optionally.
- iv. Contains administrator roles on the system.
 - Administrator can “Manage User Accounts”
 - Administrator can “Manage Mood Diary”
 - Administrator can “Manage Firebase Database”

a. Use Case Narrative

MTEJ - 01

Title: Login

Summary: The user will login into their personal account to have access to their saved data on the MTEJ website.

Actors: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Aironne Mark L. Quintela

Flow of Events

Pre-conditions:

1. The user must have their own personal computer/laptop/mobile device with an installed browser.
2. The user must have access to the internet.
3. The user must have a registered account.
4. The user must input their proper login credentials such as their email and password.

Main Success Scenario:

1. The user will access the website through its address using a browser's search engine.
2. The website will load and direct the user to the login page.
3. The user will click on the login hyperlink.
4. The user will enter the necessary login credentials:
 1. Email
 2. Password
5. After login, the user will be redirected to the website's homepage / main page.

Alternative Sequence:

A1. The user does not have a registered account.

1. The user will click the "register" hyperlink and proceed to the account registration.

Error Sequence:

E1. The user attempts to log in during an internet connection lost.

1. The system will not run.

E1.4a The user left a field blank.

1. A system error message will be displayed.

E1.4b The user inputs an unrecognized email address.

1. A system error message will be displayed.

E1.4c The user inputs an empty email address.

1. A system error message will be displayed.

E1.4d The user inputs invalid password.

1. A system error message will be displayed.

E1.4e The user inputs an empty password.

1. A system error message will be displayed.

Post Conditions:

1. The user has successfully logged in on the website.

MTEJ - 02

Title: Logout

Summary: The user will log out of their account and go back to the home page.

Actors: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Aironne Mark L. Quintela

Flow of Events

Pre-conditions:

1. The user must have their own personal computer/laptop/mobile device with an installed browser.
2. The user must have access to the internet.
3. The user must have an account and is successfully logged in to the system.
4. The user is at any of the following web pages: homepage, mood diary, automatic thought journal (ATJ), alternative thought (AT) entry, mood diary entries, or ATJ/AT entry pages of the website.

Main Success Scenario:

1. The user clicks the log out button on the upper right side of the navigation bar or at the sidebar of the website.

Alternative Sequence:

A1. The user decides to cancel logout.

1. The user stays at their current page.

Error Sequence:

E1. The user attempts to logout during an internet connection lost.

1. The browser will display an internet connection lost error.

Post Conditions:

The user has successfully logged out of their account.

MTEJ - 03

Title: Register

Summary: The user creates an account to use the websites features.

Actors: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Aironne Mark L. Quintela

Flow of Events

Pre-conditions:

1. The user must have their own personal computer/ laptop/ mobile device with an installed browser.
2. The user must have access to the internet.
3. The user must access the website using a browser's search engine.
4. The user must have prepared their required information needed upon creating an account.

Main Success Scenario:

1. The user accesses the website by typing the website's address in the browser's address bar.
2. The user will be redirected to the homepage button.
3. The user is at any of the following web pages: homepage, tungkol sa amin page, mood diary information page, automatic thought entry information page, register page, forgot your password page or the email confirmation page.
4. The user will click the "Log In" button located at the sidebar or at the navigation bar.
5. The user clicks on the "Wala pang account? Gumawa na!"
6. The user inputs their valid personal information to create their personal account:
 1. First Name
 2. Last Name
 3. Email
 4. Password
 5. Confirm Password

7. The user clicks on the “Magrehistro” button.
8. The user will be redirected to the email verification page and an email will be sent to their respective email addresses for confirmation.
9. The user clicks on the confirm email link as they check the email sent to their respective email provider’s inbox for confirmation.
10. The user will then be redirected to the homepage of the website and is now successfully registered.

Alternative Sequence:

- A7. The user decides to cancel registration
 1. The user will not be able to register.

Error Sequence:

- E1. The user is accessing the website during an internet connection lost.
 1. The browser will display an internet connection lost error.
- E6.a.1. The user left the first name field blank
 1. A system error message will be displayed.
- E6.a.2 The user inputted an invalid first name format.
 1. A system error message will be displayed.
- E6.b.1. The user left the last name field blank
 1. A system error message will be displayed.
- E6.b.2 The user inputted an invalid last name format.
 1. A system error message will be displayed.
- E6.c.1. The user left the email field blank
 1. A system error message will be displayed.
- E6.c.2 The user inputted an invalid email format.
 1. A system error message will be displayed.
- E6.d.1. The user left the password field blank
 1. A system error message will be displayed.
- E6.d.2 The user inputted an invalid password format.
 1. A system error message will be displayed.

E6.e.1. The user left the confirm password field blank

1. A system error message will be displayed.

E6.e.2 The user did not match the confirm password to the password format.

1. A system error message will be displayed.

E6. The user has left at least one field blank.

1. A system error message will be displayed.

E9. The user did not click the “confirm email” link sent on their email address.

1. User will not be able to register.

Post Conditions:

1. The user account is created.
2. The user is now included in the list of users in the database.

MTEJ - 04

Title: Forgot Password

Summary: The user can renew password when current password is forgotten

Actors: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Aironne Mark L. Quintela

Flow of Events

Pre-conditions:

1. The user must have their own personal computer/laptop/mobile device with an installed browser.
2. The user must have access to the internet.
3. The user must have a registered account.
4. The user must remember their email address tied to their forgotten password account.

Main Success Scenario:

1. The user accesses the website by typing the website's address in the browser's address bar.
2. The user will be redirected to the homepage button.
3. The user is at any of the following web pages: homepage, tungkol sa amin page, mood diary information page, or automatic thought entry information page.
4. The user will click the “Log In” button located at the sidebar or at the navigation bar.
5. The user clicks on the “Nakalimutan ang iyong password? Palitan natin yan!”
6. The user inputs their valid email address to validate their account.
7. The user clicks on the “I-reset ang Password” button.
8. The user will be redirected to the email verification page and an email will be sent to their respective email addresses for confirmation.
9. The user clicks on the confirm email link as they check the email sent to their respective email provider's inbox for confirmation.

10. The user will then be redirected back to the website to enter a new password.

Alternative Sequence:

A7. The user decides to cancel the renewal of their password.

1. The user will not be able to reset their password.

Error Sequence:

E1. The user is accessing the website during an internet connection lost.

1. The browser will display an internet connection lost error.

E6.a. The user left the email address field blank

1. A system error message will be displayed.

E6.b The user inputted an invalid email format.

1. A system error message will be displayed.

E9. The user did not click the “confirm email” link sent on their email address.

1. User will not be able to register.

E10.a. The user inputs the wrong password for the confirmation password.

1. A system error message will be displayed

E10.b. The user inputs a weak password.

1. A system error message will be displayed

Post Conditions:

1. The user has successfully changed their password.

2. The user's password is now updated on the database.

MTEJ - 05

Title: Email Confirmation

Summary: The user verifies their email address upon registration or reset of password.

Actors: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Aironne Mark L. Quintela

Flow of Events

Pre-conditions:

1. The user must have their own personal computer/laptop/mobile device with an installed browser.
2. The user must have access to the internet.

Main Success Scenario:

1. The user accesses the website by typing the website's address in the browser's address bar.
2. The user will be redirected to the homepage button.
3. The user is at any of the following web pages: homepage, tungkol sa amin page, mood diary information page, or automatic thought entry information page.
4. The user will click the “Log In” button located at the sidebar or at the navigation bar.
5. The user clicks on the “Nakalimutan ang iyong password? Palitan natin yan!” or the “Wala pang account? Gumawa na!”
 - a. If user clicks on the “Nakalimutan ang iyong password? Palitan natin yan!”, the user will be redirected to the “Forget Your Password” page.
 - i. User enters their valid email address.
 - ii. The user clicks on the “I-reset ang Password” button.
 - b. If a user clicks on the “Wala pang account? Gumawa na!”, the user will be redirected to the “Register” page.
 - i. User enters the following:
 1. First Name

2. Last Name
 3. Email
 4. Password
 5. Confirm Password
- ii. The user clicks on the “Magrehistro” button.
6. The user will be redirected to the email verification page and an email will be sent to their respective email addresses for confirmation.

Alternative Sequence:

A5.a.ii. The user decides to cancel the renewal of their password.

1. The user will not be able to reset their password.

A5.b.ii. The user decides to cancel registration

1. The user will not be able to register.

Error Sequence:

E1. The user is accessing the website during an internet connection lost.

1. The browser will display an internet connection lost error.

E5.a.1. The user left the email address field blank

1. A system error message will be displayed.

E5.a.2. The user inputted an invalid email format.

1. A system error message will be displayed.

E5.b.i.1.a. The user left the first name field blank

1. A system error message will be displayed.

E5.b.i.1.b. The user inputted an invalid first name format.

1. A system error message will be displayed.

E5.b.i.2.a. The user left the last name field blank

1. A system error message will be displayed.

E5.b.i.2.b. The user inputted an invalid last name format.

1. A system error message will be displayed.

E5.b.i.3.a. The user left the email field blank

1. A system error message will be displayed.

E5.b.i.3.b. The user inputted an invalid email format.

1. A system error message will be displayed.

E5.b.i.4.a. The user left the password field blank

1. A system error message will be displayed.

E5.b.i.4.b. The user inputted an invalid password format.

1. A system error message will be displayed.

E5.b.i.5.a. The user left the confirm password field blank

1. A system error message will be displayed.

E5.b.i.5.b. The user did not match the confirm password to the password format.

1. A system error message will be displayed.

E5.b.i. The user has left at least one field blank.

1. A system error message will be displayed.

Post Conditions:

1. If user resets their password:

- a. The user has successfully changed their password.
 - b. The user's password is now updated on the database.

2. If user registers:

- a. The user has created a new account.
 - b. The user's account will not be included on the list of users in the database.

MTEJ - 06

Title: Add Mood Diary (MD) Entry

Summary: The user will add their entry for the Mood Diary feature

Actors: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Karl John M. Punzalan

Flow of Events

Pre-conditions:

1. The user must have their own personal computer/laptop/mobile device with an installed browser.
2. The user must have access to the internet connection.
3. The user must access the website through its address using a browser's search engine.
4. The user must have a fully registered account recognized by the system.
5. The user must be successfully logged in to the system.

Main Success Scenario:

1. The user must go to the mood diary feature of the website.
2. The user must click the "Add Entry" button then a modal will show up.
3. The user enters the following information:
 1. Date
 2. Time
 3. Mood
4. The user clicks the "Magdagdag ng Bagong Entry" button.

Alternative Sequence:

- A4. The user decides to cancel the mood entry during selection of mood level.
1. The modal will close, focusing the user back to the mood chart.

Error Sequence:

E3. The user leaves at least one field empty.

1. A system error message will be displayed.

E3.1. The user enters an empty date.

1. A system error message will be displayed.

E3.2. The user enters an empty time.

2. A system error message will be displayed.

E3.3. The user enters an empty mood.

1. A system error message will be displayed.

Post Conditions:

1. Mood diary entry is added.
2. Mood diary entry is saved on the database.

MTEJ - 07

Title: View Mood Diary (MD) Entry

Summary: The user may view their Mood Diary entry in the web application.

Actor: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Iyanla Angeli L. Sosa

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged into the system.
4. The user must have a fully registered account recognized by the system.
5. The user must have added an entry for the Mood Diary.

Main Success Scenario:

1. The user chooses the “MD Entries” button located on the sidebar to view their mood diary entries.

Alternative Sequence:

- A7. The user did not continue in viewing input for Mood Diary.
1. The user may cancel and click the “Home” button to exit the page.
 2. The user will be redirected to the homepage

Post Conditions:

1. The user has viewed Mood Diary entries.

MTEJ - 08

Title: Add Automatic Thought Journal (ATJ) Entry

Summary: The user may add an Automatic Thought Journal entry in the web application.

Actor: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Iyanla Angeli L. Sosa

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged into the system.
4. The user must have a fully registered account recognized by the system.

Main Success Scenario:

1. The user will log into the system and will be redirected to the homepage of the site.
2. The user will choose to click the "Magpatuloy" button to input an entry for Automatic Thought Journal.
3. The user will read a specific question regarding their triggering event.
4. The user enters their triggering event in the text area.
5. The user will read a specific question regarding their automatic thoughts.
6. The user enters their automatic thoughts in the text area.
7. The user will read a specific question regarding their automatic feelings.
8. The user enters their automatic feelings in the text area.
9. The user will read a specific question regarding their automatic behavior.
10. The user enters their automatic behavior in the text area.
11. The user saves their automatic thought journal entry.

Alternative Sequence:

- A8. The user did not continue in entering input for Automatic Thought Journal.
 - 1. The user may cancel and click the “Home” button to exit the page.
 - 2. The user will be redirected to the homepage.

Error Sequence:

E8.3 No triggering event was entered.

- 1. A system error will be displayed.

E8.5 No automatic thoughts were entered.

- 1. A system error will be displayed.

E8.7 No automatic feelings were entered.

- 1. A system error will be displayed.

E8.9 No automatic behavior was entered.

- 1. A system error will be displayed.

Post Conditions:

- 1. The user has added an Automatic Thought Journal entry.
- 2. Automatic Thought Journal is saved on the database.

MTEJ - 09

Title: Add Alternative Thought (AT) Entry

Summary: The user may add an Alternative Thought entry in the web application.

Actor: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Iyanla Angeli L. Sosa

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged into the system.
4. The user must have a fully registered account recognized by the system.
5. The user must have first inputted an Automatic Thought Journal entry.

Main Success Scenario:

1. The user finishes logging in an entry for the Automatic Thought Journal.
2. The user will then proceed to choose the “Magpatuloy sa Alternative Thought Entry” button to input an entry for Alternative Thought entry.
3. The user will read a specific question regarding their alternative thoughts.
4. The user enters their alternative thoughts in the text area.
5. The user will read a specific question regarding their alternative feelings.
6. The user enters their alternative feelings in the text area.
7. The user will read a specific question regarding their alternative behavior.
8. The user enters their alternative behavior in the text area.
9. The user saves their alternative thought journal entry.

Alternative Sequence:

- A09. The user did not continue in entering input for Alternative Thought Entry.
1. The user may cancel and click the “Home” button to exit the page.
 2. The user will be redirected to the homepage.

Error Sequence:

E9.3 No alternative thoughts were entered.

1. A system error will be displayed.

E9.5 No alternative feelings were entered.

1. A system error will be displayed.

E9.7 No alternative behavior was entered.

1. A system error will be displayed.

Post Conditions:

1. The user has added an Alternative Thought entry.
2. Alternative Thought Entry is saved on the database.

Title: View ATJ/AT Entries

Summary: The user may view their Automatic Thought Journal and Alternative Thought entry in the web application.

Actor: User

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Iyanla Angeli L. Sosa

Flow of Events

Pre-conditions:

1. The user must have access to the internet connection.
2. The user must access the website through its address using a browser's search engine.
3. The user must be successfully logged into the system.
4. The user must have a fully registered account recognized by the system.
5. The user must have inputted an Automatic Thought Journal entry.
6. The user must have inputted an Alternative Thought Journal entry.

Main Success Scenario:

1. The user chooses the “ATJ Entries” button located on the sidebar to view their automatic thought entries.
2. The user then chooses the “Home” button to return to the homepage and view their alternative behavior at the bottom of the page.

Alternative Sequence:

A10. The user did not continue in viewing input for Automatic Thought Journal and Alternative Thought Entry .

1. The user may cancel and click the “Home” button to exit the page.
2. The user will be redirected to the homepage.

Post Conditions:

1. The user has viewed Automatic Thought Journal and Alternative Thought Entry.

MTEJ - 11

Title: Manage User Accounts

Summary: The administrator will manage user accounts from the database

Actor: Administrator

Flow of Events

Pre-conditions:

1. The administrator must have access to the internet connection.
2. The administrator must access the website through its address using a browser's search engine.
3. The administrator must be successfully logged in to the system.
4. The administrator must have a fully registered account recognized by the system.

Main Success Scenario:

1. The administrator can view all users from the database.

Alternative Sequence:

A11. The administrator did not continue viewing the user accounts.

1. The user may cancel and click the “Homepage” button to exit the page.
2. The user will be redirected to the homepage.

Post Conditions:

1. The administrator can now view all active users from the database.

MTEJ - 12

Title: Manage Mood Diary

Summary: The administrator will manage the mood diary from the database.

Actors: Administrator

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Karl John M. Punzalan

Flow of Events

Pre-conditions:

1. The administrator must have access to the internet connection.
2. The administrator must access the website through its address using a browser's search engine.
3. The administrator must be successfully logged in to the system.
4. The administrator must have a fully registered account recognized by the system.

Main Success Scenario:

1. The administrator must click the "Mood Diary" on the sidebar.
2. The administrator can view all users from the database with their respective mood entries.

Alternative Sequence:

A1. The administrator decides to log out from the system.

1. The administrator will not be able to view the mood diary database.

Error Sequence:

E2. The administrator lost their internet connection.

1. The browser will display a system error.

Post Conditions:

1. The administrator can now view all mood diary entries.

Title: Manage Firebase Database

Summary: The administrator can manage the database directly at Google's Firebase Database Console.

Actors: Administrator

Creation Date: March 24, 2022

Date of Update: July 9, 2022

Version: v1.1

Person in Charge: Karl John M. Punzalan

Flow of Events

Pre-conditions:

1. The administrator must have access to the internet connection.
2. The administrator must access the website through its address using a browser's search engine.
3. The administrator must be successfully logged in to the system.

Main Success Scenario:

1. The administrator must click the "Go to console" button.
2. The administrator must click the website's system project.
3. The administrator must click the "Build" dropdown button on the sidebar.
4. The administrator must click the "Realtime Database" dropdown button on the sidebar.

Alternative Sequence:

A1. The administrator decides to log out from the system.

1. The administrator will not be able to view the mood diary database.

Error Sequence:

E1. The administrator lost their internet connection.

1. The administrator will not be able to view the mood diary database.

Post Conditions:

1. The administrator can now edit, delete, update, and manage the system project's database.

b. Screen Layouts (Prototype)

Since its development, the MTEJ's original prototype screen layout designs from Chapter 3 significantly changed from its original design. Currently, there are now a total of 10 developed layouts which are as follows: (1) Login, (2) Register, (3) Forgot Your Password, (4) Email Confirmation, (5) Tungkol Sa Amin, (6) Home Page, (7) Mood Diary, (8) Automatic Thought Journal, (9) Manage User Accounts, and (10) Manage Mood Diary. The new development layout is now brighter and instigates happiness and better mood for users to use.

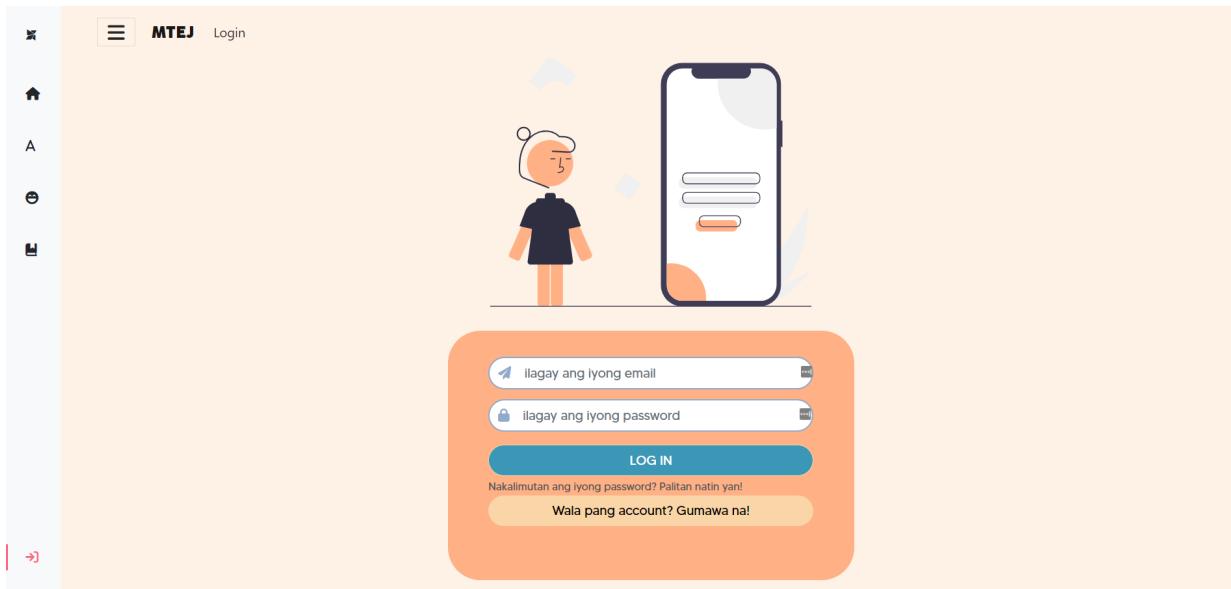


Figure 4.c.1 Login

Figure 4.c.1 shows the new development design for the “Login” page. The new design has a more clear concept and has 2 inputs that accommodate user entries for logging in. It also has 3 buttons that redirect the user to other pages of the website. The first button is for logging in, the second one is when the user forgets their password, and the third one is for creating and registering an entirely new account on the system.

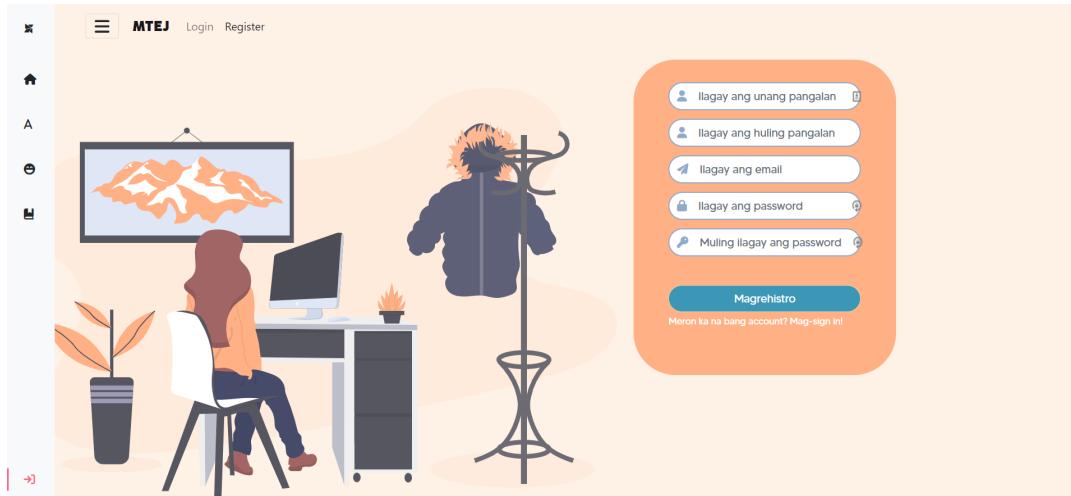


Figure 4.c.2 Register

Figure 4.c.2 shows the development design for the “Register” page. There are no significant changes that took place from the original design concept. However, the header’s color has now blended with the background color of the page.

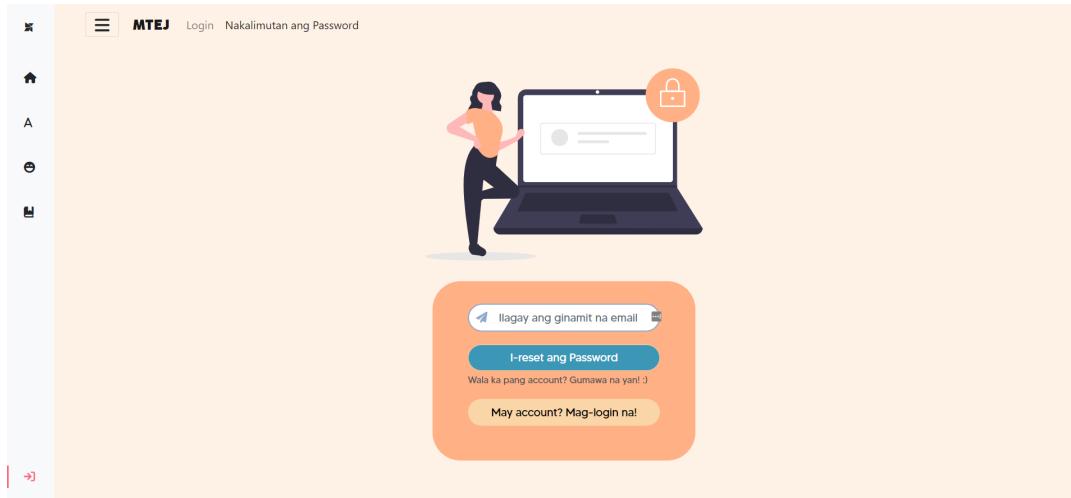


Figure 4.c.3 Forgot Your Password

Figure 4.c.3 shows the development design for the “Forgot Your Password” page. There are no significant changes that took place in the new prototype design except for some minimal text changes in the buttons. The header also matched the background’s color this time.

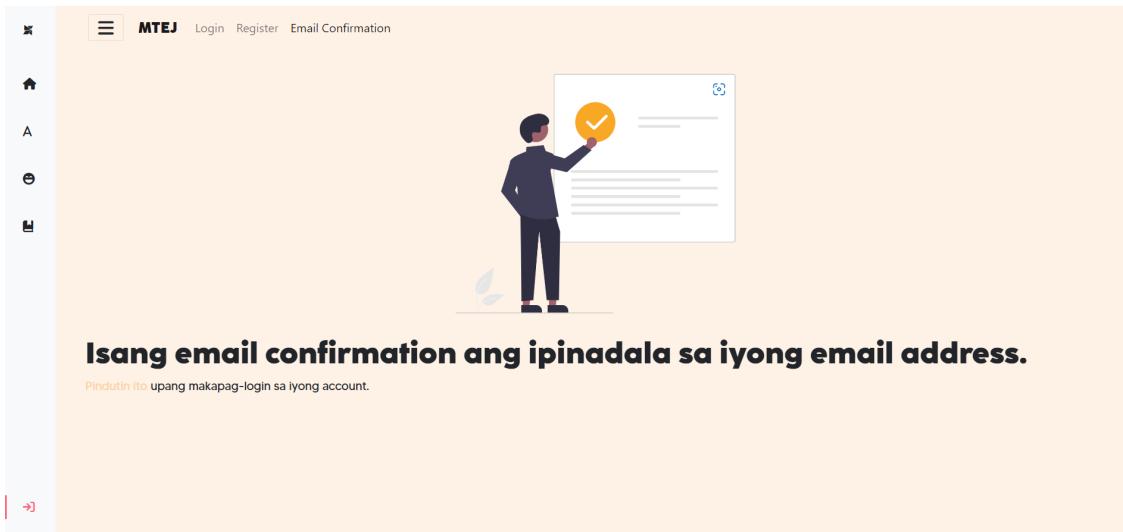


Figure 4.c.4 Email Confirmation

Figure 4.c.4 shows the new development design for the email confirmation page.

The user is redirected to the page after they have successfully registered for an account wherein an email confirmation is sent to their personal email as a requirement before logging into the web application.

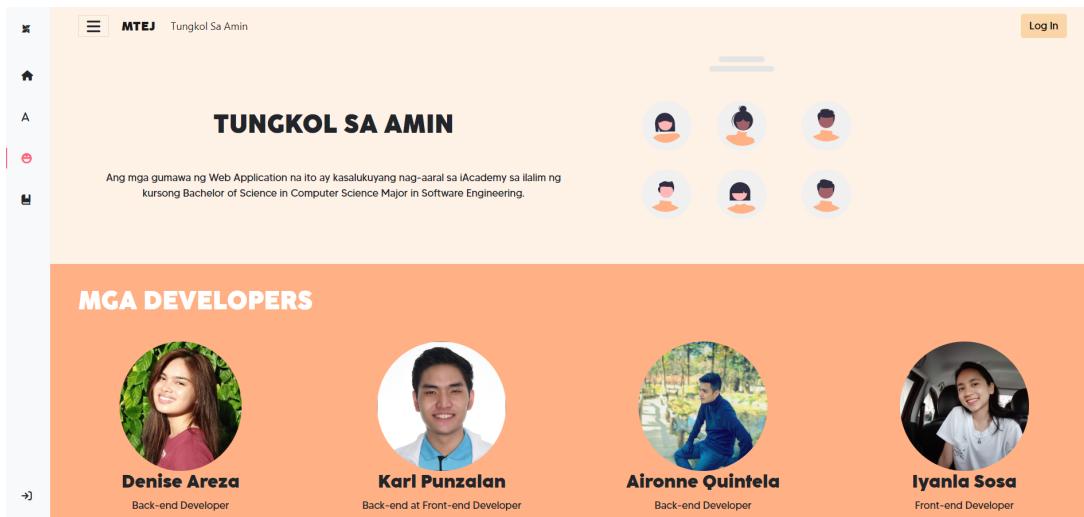


Figure 4.c.5 Tungkol Sa Amin

Figure 4.c.5 shows the new development design for the “Tungkol Sa Amin” page.

The design now shows the developer’s pictures rather than the original design concept using clip

art taken from unDraw. The new design also includes a developer who recently joined the team in April 2022. The color scheme matches the original Chapter 3 design, while slightly tweaking the font, texts, and the layout of the design.

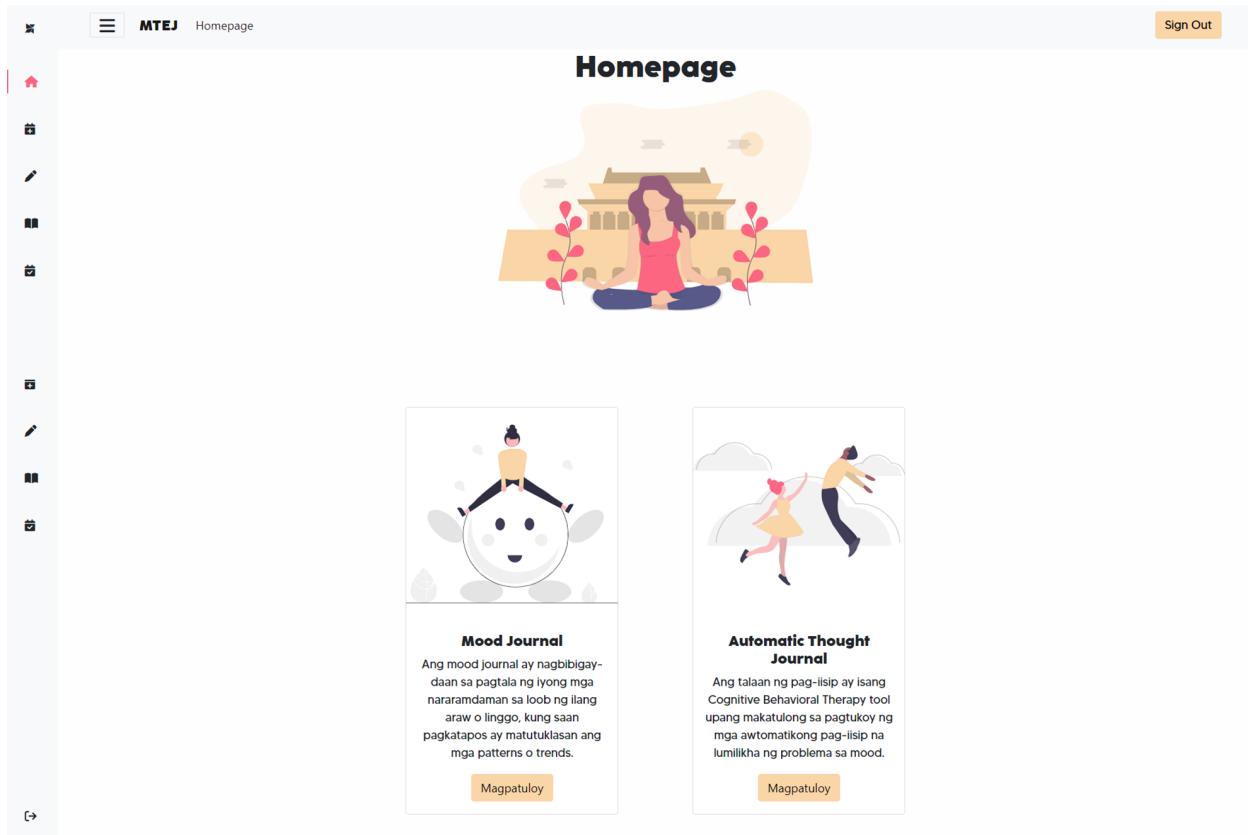


Figure 4.c.6 Home Page

Figure 4.c.6 shows the new development design for the homepage upon successfully logging into the web application which displays the two main features of the website. The user may then choose whether to continue with either the Mood Journal or the Automatic Thought Journal to input their entries. The user may also access other features of the website that are located on the sidebar that allows them to view their entries for the Mood Diary and Automatic Thought Journal.



Figure 4.c.7 Mood Diary

Figure 4.c.7 shows the new development design for the “Mood Diary” entry of a user using Chart.js as its Javascript library framework behind the chart. The chart shows the user’s mood in two ways: (1) Day-to-Day Mood, and (2) Entry-by-Entry Mood. The “Day-to-Day Mood” shows the user’s daily entries regardless of adding more entries on the same day. On the other hand, the “Entry-by-Entry Mood” shows all the user’s individual entries. The user’s moods are showcased in 10 different levels, ranging from “Worst” to “Elevated”.

The screenshot shows a web-based application titled "Automatic Thought Journal". At the top, there is a navigation bar with icons for Home and ATJournal, and a "Sign Out" button. The main title "Automatic Thought Journal" is displayed prominently. Below the title, there is a dropdown menu with four items: "Unang Tanong", "Ikalawang Tanong", "Ano ang iyong mga awtomatikong naisip?", and "Automatic Thoughts". Each item has a small downward arrow icon to its right. Below this menu, there are two more sections: "Ikatlong Tanong" and "Ikaapat na Tanong", each with a downward arrow icon. In the center of the page, there are two buttons: "I-save ang Automatic Thought Journal" and "Magpatuloy sa Alternative Thought Entry". A note below the buttons states: "Ang pag-click sa button na ito ay mag-re-direct sa alternatibong thought journal".

Figure 4.c.8 Automatic Thought Journal

Figure 4.c.8 shows the new development design for the “Automatic Thought Journal” page. The questions are no longer arranged in a single row but are now arranged in a dropdown design which are separated into four specific questions for the (1) triggering event; (2) automatic thought; (3) automatic feeling; (4) resulting behavior. The date is automatically inputted by the system and the user may input their answers in the provided text fields. Once the user is done with their entry, they may now save their Automatic Thought Journal to record their input and proceed to the Alternative Thought entry. If the user has not experienced any triggering events, they may choose to cancel their inputs and return to the homepage.

The screenshot shows a web application interface titled "MANAGE USERS". At the top, there is a navigation bar with icons for menu, search, and sign out, followed by the text "MTEJ Homepage Manage Users" and a "Sign Out" button. On the left, there is a sidebar with icons for back, forward, and search. The main content area displays a table with the following data:

First Name	Last Name	Email	State	Action
Aironne	Quintela	speedstackingboy251@gmail.com	user	
Yani	Sosa	iyanlasosa04@gmail.com	user	
Aironne	Quintela	captmarkpolo25@gmail.com	user	
Karl John	Punzalan	karljohn.punzalan@gmail.com	user	
aironne	quintela	admin@admin.com	user	
James	Cos	jamestest@gmail.com	user	
Anna	Pascual	annapascual@gmail.com	user	
Mark	Qyubtea	speedstackingboy251@gmail.com	user	

Figure 4.c.9 Manage User Accounts

Figure 4.c.9 shows the new development design for the “Manage User Accounts” page for the administrator side of the project. The design uses a data table that allows administrators to freely manipulate data with its built-in search and pagination features. The table shows 5 table headers: (1) First Name, (2) Last Name, (3) Email, (4) State, and (5) Action. The first and second column are the user’s first name and last name. The third column shows the user’s email address as their main key for logging in our system. The fourth column is the user’s state if they are a normal user or an admin. Lastly, the fifth column is the action column that contains a “View User” button wherein when clicked, it will show a modal counterpart of the user’s data.

The screenshot shows a web application interface titled "MANAGE MOOD DIARY". At the top right is a "Sign Out" button. Below the title, a sub-header reads "Manage mood diary:". A table lists user information with columns: First Name, Last Name, Email, State, and Action. The Action column contains two buttons: "Time" (green) and "Average" (orange). The table rows are as follows:

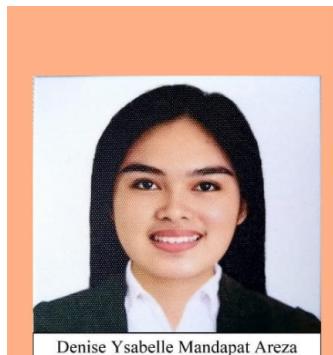
First Name	Last Name	Email	Action
Aironne	Quintela	speedstackingboy251@gmail.com	Time Average
Yani	Sosa	iyanlasosa04@gmail.com	Time Average
Aironne	Quintela	captmarkypolo25@gmail.com	Time Average
Karl John	Punzalan	karljohn.punzalan@gmail.com	Time Average
aironne	quintela	admin@admin.com	Time Average
James	Cos	jamestest@gmail.com	Time Average
Anna	Pascual	annapascual@gmail.com	Time Average
Mark	Oyubteea	speedstackingboy251@gmail.com	Time Average
Aironne	Quintela	aironne.quintela25@gmail.com	Time Average
Aironne	Quintleia	aironne.quintela25@gmail.com	Time Average
Denise Ysabelle	Areza	arezadeneysabelle@gmail.com	Time Average

Figure 4.c.10 Manage Mood Diary

Figure 4.c.10 shows the new development design for the “Manage Mood Diary” page for the administrator side of the project. Similar to Figure 4.c.9’s “Manage Users”, this page shows the use of a data table as well that displays each unique user’s data information. The sole difference is that the action button now contains two buttons: (1) Mood Entries and (2) Average Entries per day. This first button, mood entries, will display a modal that contains a data table displaying all the user’s mood diary entries that they accumulated when clicked. On the other hand, the second button, average entries per day, will display a modal as well containing a data table that displays the user’s mood diary entries that are averaged out per day.

Appendices

Curriculum Vitae (Areza, Denise Ysabelle)



Denise Ysabelle Mandapat Areza

PROFILE

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EDUCATIONAL BACKGROUND

2020 - Present **BACHELOR OF SCIENCE IN COMPUTER SCIENCE MAJOR IN SOFTWARE ENGINEERING** – Information and Communications Technology Academy iAcademy Nexus Campus, 7434 Yakal Street, Barangay San Antonio, Makati City

2018 - 2020 **SHS TECHNICAL VOCATIONAL LIVELIHOOD TRACK – INFORMATION AND COMMUNICATION TECHNOLOGY** – STI ACADEMIC CENTER LAS PIÑAS Alabang-Zapote Road, Las Piñas City

2014 - 2018 **JUNIOR HIGH SCHOOL** – WOODRIDGE COLLEGE
Soldiers Hills 4, Molino 6, Bacoor, Cavite City

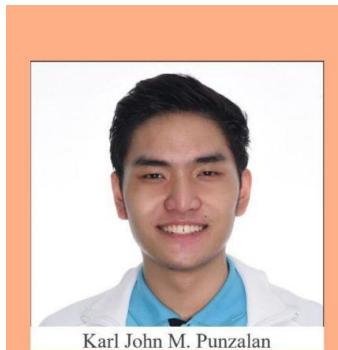
AWARDS

2017 - 2018 **BEST IN COMPUTER AND WEB DESIGN**

2015 - 2016 **GENERAL EXCELLENCE RANK 5** (2nd Honor)
BEST IN KODU GAME DEVELOPMENT
ASMEPPS REGIONAL DRAWING CONTEST 2015, Champion
ASMEPPS NATIONAL DRAWING CONTEST REPRESENTATIVE OF REGION IV- A CALABARZON 2015, Champion
MSAA ON THE SPOT DRAWING CONTEST 2015 Champion

2014 - 2015 **GENERAL EXCELLENCE RANK 4** (1st Honor)

Curriculum Vitae (Punzalan, Karl John)



Karl John M. Punzalan

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2017 - 2019 **SHS TECHNICAL-VOCATIONAL LIVELIHOOD SPECIALIZED IN SOFTWARE DEVELOPMENT** – Information and Communications Technology Academy
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AWARDS AND ORGANIZATIONS

2020 - 2022 **Academic Excellency at iACADEMY**, (First Honors - Dean's Lister)
Computing Students that Innovate and Lead (COMPILE), Secretary

2019 - 2020 **Academic Excellency at DLSU-D**, (First Honors - Dean's Lister)
iJunior Software Developers (iJSD), Secretary

2017 - 2018 **Rappler's Hack Society 2018: Build Tomorrow Hackathon Competition**, Finalist
Best Project-Based Learning (PBL) in Software Development, Finalist (Archon Assist)
Best Arduino in Robotics, Third Place (Wurf Bot)
Best Project-Based Learning (PBL) in Game Development, Champion (Remedy)
Best Gameplay in Game Development, Remedy

Curriculum Vitae (Quintela, Aironne Mark)

	<h1>Aironne Mark Quintela</h1> <p> Pasay City, NCR, Philippines 1300  aironne.quintela25@gmail.com  +63 906 586 7217  linkedin.com/in/aironne.quintela102501</p>
PROFILE	
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Awards and Organizations	EDUCATION <p>2019 - Current iAcademy BS Computer Science with Specialization in Software Engineering</p> <p>2016 - 2019 iAcademy Senior High School Level (Software Development Strand)</p> <ul style="list-style-type: none">● Top 20 Finalist at Program The Future Accenture Hackathon 2021 Developed and designed an e-waste recyclable waste app for local communities. Role: Team Leader● Won #RaceForAction Hackathon with the theme Media Literacy 2020 Proposed and designed a website extension mockup that detects fake news on social media sites. Role: UI/UX Lead Designer.● Top 6 Finalist at Philam Life Hackers 2019 Created an emergency app in case of worst-case event/scenario for policy holders and insurance companies. Role: UI/UX Assistant Designer, UI Mobile Developer.● Won "BEST GAMEPLAY" and "BEST Project-Based App" Game Award "REMEDY" 2017 Created a game application that would help those people who have Muscular Dystrophy. Role: Assistant Programmer

Curriculum Vitae (Sosa, Iyanla Angeli)



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AWARDS

2020 – 2022	ACADEMIC EXCELLENCE – IACADEMY (2nd Honors – Dean's Lister)
2019 – 2020	ACADEMIC EXCELLENCE – MARIKINA CATHOLIC SCHOOL (With Honors)
2018 - 2019	ACADEMIC EXCELLENCE – MARIKINA CATHOLIC SCHOOL (With Honors)
2017 - 2018	ACADEMIC EXCELLENCE – MARIKINA CATHOLIC SCHOOL (With Honors)
2014 – 2015	ACADEMIC EXCELLENCE – MARIKINA CATHOLIC SCHOOL (With Honors) MVP ACADEMIC EXCELLENCE AWARDS (PLDT – SMART Foundation)

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Chapter 1

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Chapter 2

History of Mood and Mood Disorders

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