My Therapist: Mental Health Companion on the Go

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ABSTRACT
In the realm of mental health, dynamic disorders can greatly affect individuals, their families, healthcare infrastructure, and other societal aspects. Studies indicate that roughly 30% of individuals in Europe and the USA will experience mental health issues at some point in their lives. Previously, patients had to rely on direct interaction with doctors for their mental health concerns as onlineservices were not available. A new research paper explores how cell phones are assisting patients in monitoring their mental health or mental problems. This technology enables patients to collect data on their mental health-related issues and track their progress. Additionally, information mining techniques are analyzed. The paper provides a summary of the advantages and limitations of the most promising cell phone technologies for detecting mood disorders, includingdepression and bipolar disorder, based on prior research. Additionally, it covers practical aspects of implementing these technologies, such as legal considerations, business models, and specific details related to their use as clinical devices.

Keywords
Cell Phones, Medical equipment, Mental Disorder

1. INTRODUCTION
1.1 Confronting the Challenges of Mental Health
It has been reported that one out of four Europeans has experienced at least one mental health issue in their lifetime. The impact of mental health problems can be significant and negative, affecting not only the individual but also their loved ones. Shockingly, over 85% of individuals who commit suicide have a diagnosable mental health condition. However, despite the availability of treatment options, many individuals fail to seek treatment (72%) or drop out of treatment (58%). Patients may face challenges in accessing traditional mental healthcare due to factors such as a desire for independent problem-solving or situational/financial barriers. Combining self-assessment and monitoring tools with decentralized, patient-centered healthcare systems can efficiently reach more patients and empower them to take an active role in their care.

1.2 Cell phones as versatile medical services sensors
From an innovative perspective, it is observed that cellphones are providing frameworks for different applications in the emergency and medical care area. The prevalence of mobile phone ownership is high in developed nations, with almost everyone owning at least one device. This trend is rapidly expanding globally, with approximately 4.5 billion mobile phone users worldwide. As a result, mobile phones have become ideal tools for providing healthcare services to individuals everywhere, anytime, and to anyone. Thecurrent cell phone technology is well-suited for pervasive medical care applications, owing to three key factors. Firstly, cell phone ownership has significantly increased in recent years, with cell phones accounting for over 51.8% ofall mobile phone sales worldwide in 2013. Furthermore, since 2014, approximately 33% of mobile phone users globally own smartphones, and this trend is not limited to developed countries. Smartphones have become moreaffordable, and their functionality continues to expand rapidly, making them increasingly accessible to people around the world.

1.3 Cell phones for emotional wellness
The versatility of cell phones has made them a valuable tool for assisting patients, healthcare providers, medical administration, and mental health. As previously stated, theuse of cell phones offers numerous benefits, including their potential as a telemedicine platform for mental health. Notably, among patients with severe mental illnesses, 72% use cell phones, which is only slightly below the average usage rate of the general population. Even non-users have expressed interest in using cell phones if it could help manage their health. Additionally, 85% of healthcare providers already use cell phones, with medication guides being the most widely used application.

2. LITERATURE REVIEW
2.1 Human-PC Interface
A range of mobile phone systems has been developed to support mental health, targeting several mental disorders, such as depression, bipolar disorder, borderline personality disorder, and general-purpose systems for mood charting incognitive-behavioral therapy (CBT). Despite their variedfocus, a shared system design and set of core features have emerged. The majority of these systems make use of an Android application, a server for data storage, and an online interface for program access. Core features of these systems encompass self-reporting, automatic datasampling, behavior recognition rules, data visualization, therapeutic feedback, and communication. The MONARCA and Mobilyze! systems offer specific examples of these core features, both of which use mobile phones to address depression or bipolar disorder,integrating all of the core elements with varying add-ons and experiences.

Figure 1: Looped setup for treatment of MentalDisorder

2.2 Self-evaluation

Self-evaluation is a vital component of mental health treatment that requires patients to detail their issues with their mental state. The patient's attitude, stress level, and behavior during the self-reporting process must be considered. Clinically validated scoring scales are often used to structure self-reporting questionnaires on cell phones. With the multi-touch interface of cell phones, patients can enter their assessment scores and receive various activity options through the application screen. To facilitate this process, a proposed mobile treatment application has been suggested.

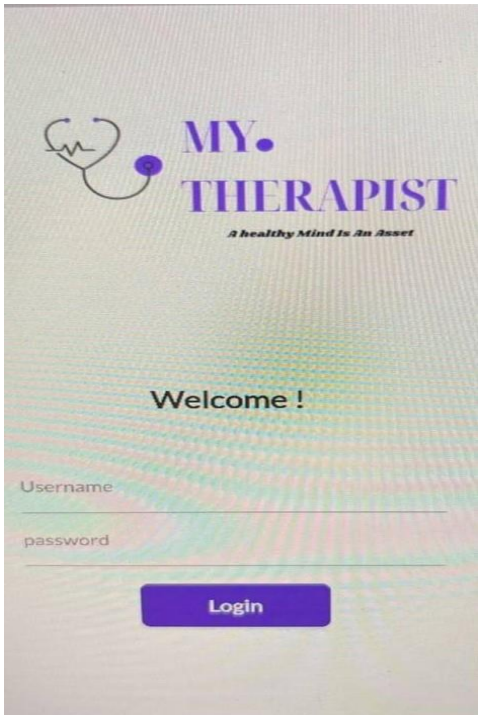

Figure 2: (a) login page

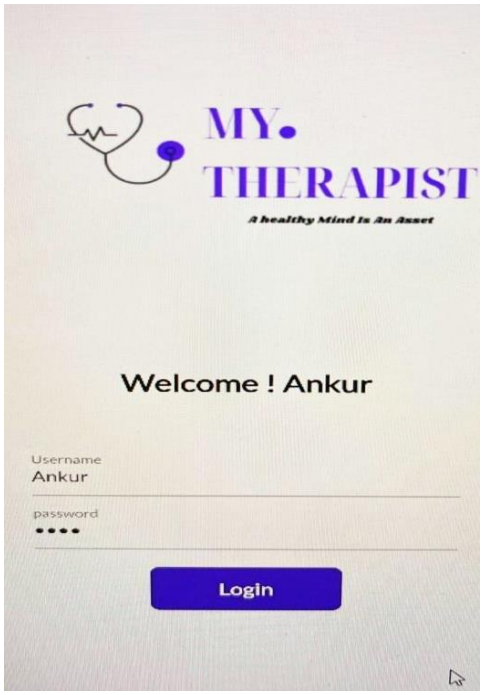

Figure 2: (b) login page after entering the ID andpassword

2.3 Information perception

Mobile phone health applications use various approaches to visualize data, such as graphs, charts, and abstract designs. Graphs are commonly used to represent important information related to mood, sleep, stress, physical activity, and social activity. In contrast, abstract visualization techniques are employed in gamified applications aimed at encouraging healthy behavior. These techniques include various metaphors and visual representations to convey the user's progress and motivate them to continue their healthy behavior. In addition to these techniques, some mobile health applications also use notifications and reminders to encourage users to engage in healthy behaviors and track their progress regularly.

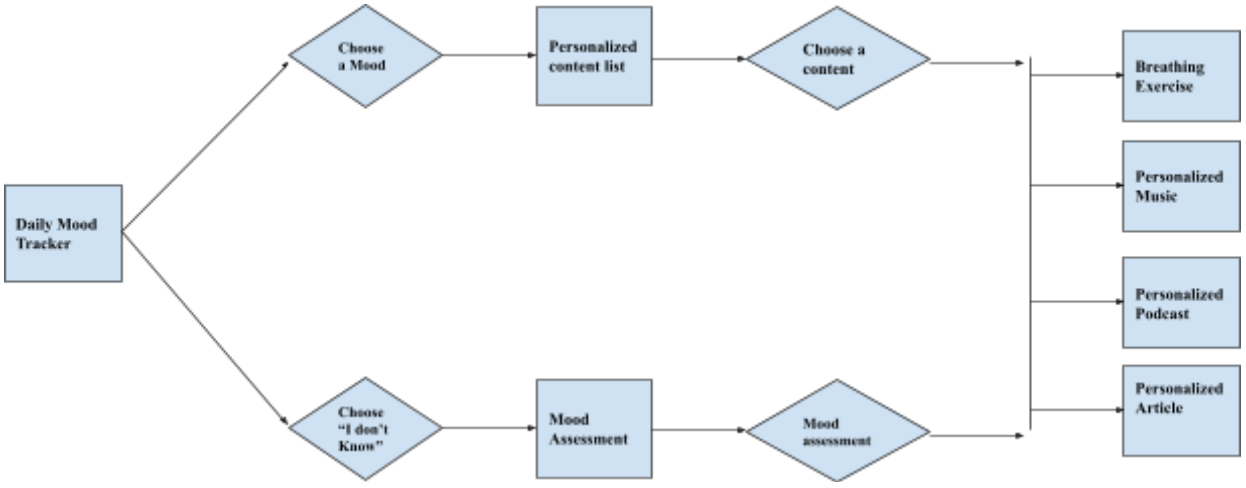

Fig 3: Proposed Framework

3. PROPOSED FRAMEWORK

The MY THERAPIST application, based on the MONARCHA framework, begins with a user interface for the login page. The login page offers two options:registration for new users or login for already registered users. For new users, creating login credentials including ID and Password is mandatory. After logging in successfully, the user will be directed to the application's homepage where they will be presented with two options:

1. "Choose a mood"

2. "Choose 'I don't know'"

If the user chooses the first option, they are redirected to a personalized content list page that includes different types of moods such as happy, stressed, sad, depressed, frustrated, and irritated, from which the user can select one according to their current mood. The application then recommends various exercises such as breathing exercises, music for relaxation, articles to read, and podcasts to gain knowledge. The user must subscribe to access these facilities, with subscription options available on a monthly or yearly basis.

If the user chooses the second option, they will take a mood assessment test similar to a psychometric test. The test comprises questions related to their daily life problems.Based on the user's responses, the application analyzes theirmood and generates a score. The application then provides various solutions like breathing exercises, binaural beats forrelaxation, articles to read, and different podcasts based on the user's scores.

4. IMPLEMENTATION

The implementation of the My Therapist applicationcomprises six pages, which are designed to assess the mental health of patients based on certain factors obtained from their responses. The assessment involves asking basic questions that provide insight into the patient's mental health. The functionality of each page is described below:

Login or Registration Page: Firstly, individuals who do not have an account must register by creating a new ID and password. They can then proceed to use the application by entering their personal information. Once this is completed, they will be directed to the home page of the application.

Home Page: A person who is facing mental health issues can take an assessment to generate scores, which can be used to analyze their mental health using the application. Based on these scores, the application suggests appropriate therapy for the individual.

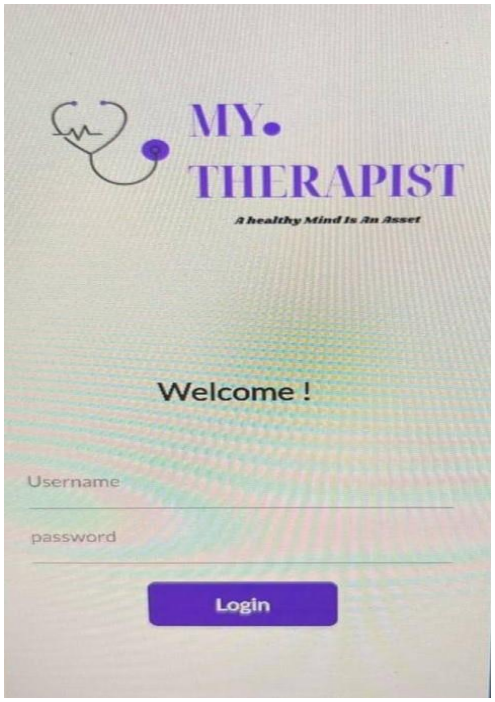

Figure 4(a): Login page

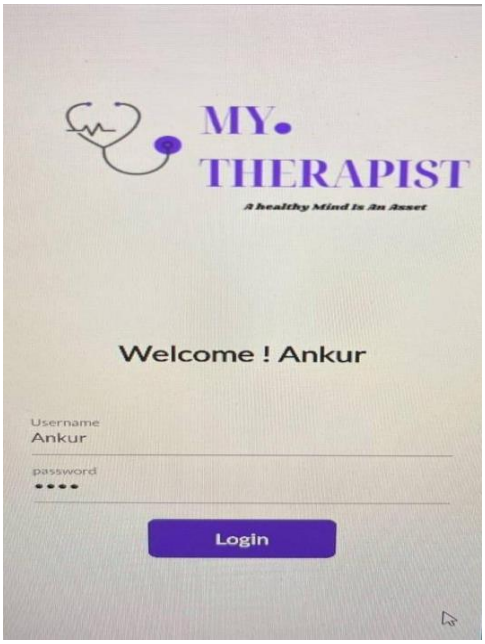

Figure 4(b): Login page after entering ID and Password

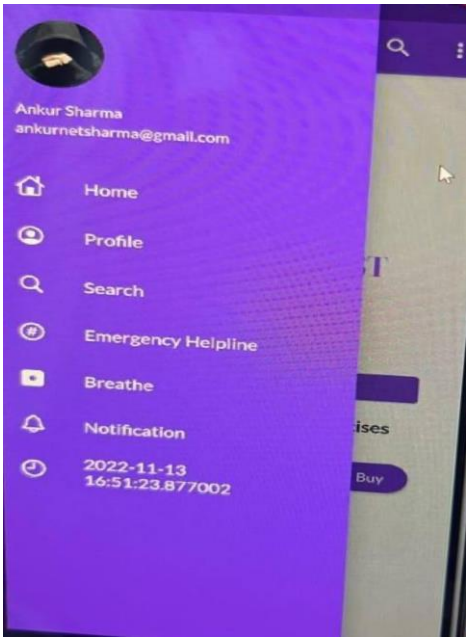

Figure 4(c): Home page

Figure 4: Smartphone User Interface of the MY THERAPIST Android Application **(a)** Login page **(b)** Login page after entering ID and Password **(c)** Home page

5. RESULT

Based on the user's mental health score, the application provides various exercises and binaural beats designed to help relax and calm the mind. These exercises and binaural beats can be accessed by the user for free. In addition, the application offers advanced exercises for users seeking more specialized support. These exercises are available through a subscription, with options for monthly and yearlyplans.

The subscription plan offers users access to an expanded range of exercises and resources, including personalized therapy sessions with trained professionals. These therapy sessions are designed to offer users more comprehensive support and

guidance to help them overcome their mental health challenges.

Overall, the MY THERAPIST application is a valuable resource for individuals seeking support for their mental health. With its personalized therapy options and comprehensive resources, the application can help users improve their emotional well-being and lead healthier, happier lives.

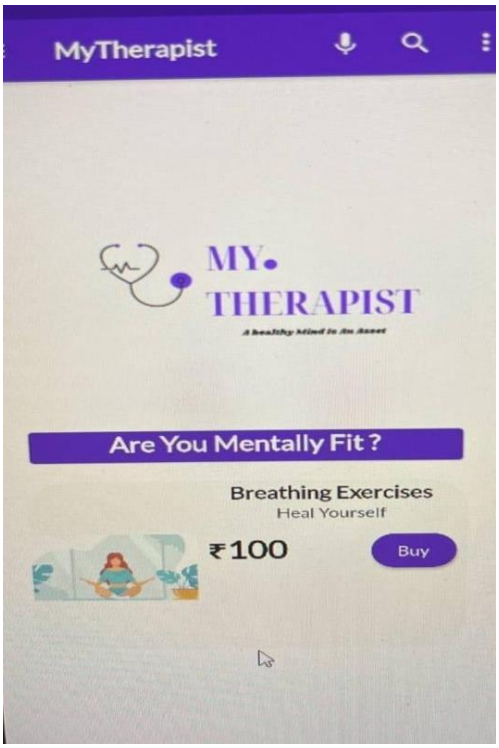

Fig.5 (a) Exercises for Mental Health to buy

Figure 5 (b) Self Report

Figure 5: Result (a) Exercises for Mental Health to buy (b) Self Report

6. CONCLUSION

Mobile phones have emerged as a promising tool for addressing mental health issues, which are prevalent in both developed and developing nations. To effectively tackle this challenge, it is important to develop efficient and effective treatments. Prior research has explored various approaches to implementing human-computer interaction (HCI) on mobile phones for individuals with mental health disorders and has provided concepts based on thesefindings. The design of HCI significantly influences user acceptance and adherence, which are critical barriers to success. Additionally, using fully designed smartphone interfaces for self-assessment surveys can improve the quality of data compared to traditional paper-based versions. From a technical perspective, smartphones are becoming increasingly capable and can perform more functions. This paper specifically focuses on identifyingmood disorders such as depression or bipolar disorder and presents the pros and cons of the most promising technologies. Finally, practical implementation issues related to legal requirements and business models for bringing effective diagnosis to the market are discussed. Clinical applications are subject to different regulatory systems in different countries, with applications classified as clinical applications required to meet similar requirements as traditional medical equipment. This includes labor and cost-intensive certification processes.

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