

1 Design and Gamification for Mental Health App Engagement

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6 Millions of individuals are affected by conditions such as anxiety, depression, and stress. While there are numerous mental support
7 apps available, all of them struggle with user retention and motivation. To address these challenges, we propose the development of a
8 gamified mental health app aimed at promoting emotional well-being and providing accessible support to users.

9 The proposed app will use gamification techniques to enhance user engagement and motivation in managing their mental health. In
10 addition to gamified elements, the app will offer therapy services delivered by qualified professionals through both online and offline
11 sessions. Users will have the flexibility to choose from a range of therapy options, including chat, audio, and video sessions, tailored
12 to their individual needs and preferences. The app will also provide access to supportive communities, resources, and educational
13 content to foster a sense of connection, understanding, and empowerment among users.

14 To ensure the effectiveness and relevance of the app, a comprehensive research and requirements-gathering process was undertaken.
15 This included conducting interviews with a diverse sample of individuals. Additionally, an extensive review of academic literature,
16 commercial products, and competitive analysis was conducted to gather insights into existing mental health solutions and identify
17 areas for improvement.

18 CCS Concepts: • **Human-centered computing** → **Collaborative and social computing systems and tools; Interactive systems**
19 and tools; User studies; HCI theory, concepts and models.

20 ACM Reference Format:

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23 USA, 26 pages. <https://doi.org/XXXXXXX.XXXXXXX>

24 1 MOTIVATION

25 According to the World Health Organization [2] (2022), Mental health is defined as the state of mental well-being
26 when individuals effectively manage the challenges faced in daily life, recognise their capabilities, thrive, and make
27 meaningful contributions to their communities.

28 In recent years, people have become increasingly aware of the importance of mental health as a part of an individual's
29 overall state of well-being. Along with it, the development of digital interventions to support individuals has also
30 boomed. However, there still exists a significant gap between those who receive adequate mental health support and
31 those who require it. According to the most recent national mental health survey, over 150 million Indians need mental
32 health support. However, only 30 million people seek care [14]. Garg et al. [13] (2019) also suggests, there is a scarcity
33 of mental health professionals, which, when coupled with people's reluctance to seek help, underscores the need for
34 improved digital solutions that engage users.

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53 2 PROBLEM STATEMENT AND VISION

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55 Our preliminary exploratory research leads us to believe that many existing technological solutions to the issues people
56 face with mental health lack user retention. Many mental health apps are not based on concrete empirical research and
57 a lot of them don't follow user-centric interaction design principles [5].

58 Through personas and scenarios, we aim to gauge motivations and pain points, mapping out a comprehensive
59 picture of the problem. The end goal of this project is to design for a smooth user experience, taking inspiration from
60 research-based principles such as gamification. Even at a rudimentary stage of research gamification shows a lot of
61 promise by enhancing engagement, fun and interactivity Citation1 and we intend to delve deeper.

62
63 In the future, Mental health apps may have an important role to play in the evolution of traditional treatment and
64 mental healthcare practices. This is primarily because the increasing democratization of technology will help combat
65 the stigma associated with mental health issues [1].
66

67 3 PROOF OF SIGNIFICANCE

68 Even though Mental health apps have been shown to be as effective as traditional mental services in improving mental
69 health conditions like depression and anxiety, the engagement with these technologies is a big issue, and is typically
70 way lower than traditional services [8]. Several studies have shown that these apps lose most of their users within the
71 first two weeks after installation [3]. Furthermore, 74% of users stop engaging with a health app after only 10 uses. In
72 the top installed mental health apps on the app store, data analysis of user engagement data shows that the median of
73 user-retention for the days 1,3 and 7 were respectively 50%, 14.5%, and 7% [3]. Long-term engagement is especially
74 difficult for these apps, due to the decreased motivation being a core feature of many mental illnesses such as depression
75 and schizophrenia [19].
76

77 A mental app needs some form of dynamic sustainable engagement with a user to provide effective mental health
78 services. This can be done by gamification of the app. Gamification uses the user's voluntary interaction with the
79 system and its affordances to promote the user in a series of psychological outcomes, such as enhanced motivation and
80 engagement, with the final aim of shaping his/her behaviors [7].
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82 4 LITERATURE REVIEW

83 **Problem Statement** - *How can user-centric design choices and gamification elements be effectively integrated into a mental
84 health application to improve user retention and engagement, addressing the gap between individuals seeking mental health
85 support and those requiring it?*

86 During a time of constant, fast-paced technological progress, we find ourselves in a new era that has seen a phe-
87 nomenal rise in mental health awareness. Furthermore, while mental health has gained a lot of attention, there is still a
88 considerable gap in the number of health professionals available to serve the needs of those who need it, as Garg et al.
89 [13] (2019) pointed out. Digital interventions have therefore become instrumental in addressing the growing demand
90 for accessible mental health support [8]. Better known as Digital mental health interventions (DMHIs). DMHIs are
91 technologies that provide mental health support to people through various means such as mobile apps, virtual reality
92 platforms or internet websites. Mental health applications, in particular, have emerged as promising tools for delivering
93 convenient and personalized interventions to individuals while ensuring the cost to achieve this is minimal [6]. However,
94 the effectiveness and impact of such interventions are limited by their inability to engage users successfully for longer
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105 durations or before any notable changes may be observed [10, 12].
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107 Therefore, despite the proliferation of mental health applications, a significant challenge persists, i.e. user engagement
108 and retention. Torous et al. [19] (2018) pointed out that while these applications hold immense potential for improving
109 mental well-being, many users disengage from them shortly after initial use, limiting the impact and effectiveness
110 of these interventions. Some of the reasons why users engaged in this behavior were the poor user-centric design
111 of the application and the fact that the applications were not perceived to be trustworthy, among other things. This
112 phenomenon of "Low Engagement" was not just limited to mental health applications but has also affected and still
113 affects both traditional and computerized therapies for mental disorders [19]. Data from a market research study
114 suggested that about 25% of users abandon or uninstall an application just after one use [15]. Achieving Long-term
115 engagement is therefore even more difficult. As an example, a study of an app to track asthma symptoms success-
116 fully enrolled nearly 8000 participants. Only 175 participants out of 8000 had engaged enough with the app in order
117 to take a survey at the end of 6 months, which is just a minuscule 2% (Chan et al., 2017, as cited in Torous et al., 2018) [19].
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122 The issue of low engagement is a complex issue to solve, and many factors are at play here. There is no one-stop
123 solution to this problem. However, a step in the right direction would be focusing on the user interface design of
124 the applications. User-centric design principles need to be incorporated into the development process. This approach
125 will help us prioritize users' needs, preferences, and experiences, aiming to create intuitive, accessible, and engaging
126 interfaces [20]. Unfortunately, many mental health applications have failed to adhere to these principles, resulting
127 in interfaces that are cumbersome, unintuitive, or unappealing to users. Our goal should be to involve end users in
128 the conception, design, and testing of apps. Bitriān et al [7] (2022) claimed close collaboration with the community to
129 learn their needs and formulate how an app may even be useful would allow us to gauge better users' preferences and
130 behaviors to create products that meet their expectations and enhance their experience
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134 Many innovative solutions have been developed in the domain of user-centered design better to serve the needs
135 and expectations of the people. One such approach that started gaining traction in the field, a few years ago, was
136 integrating game-playing elements into applications. Also known as Gamification, it is described as the application of
137 game design principles outside of gaming environments. A great example of an application that utilized principles of
138 Gamification is Duolingo. It is a language learning app that awards points, levels, and virtual rewards for completing
139 lessons and practicing regularly. An engaging feature it uses is the daily streak, where users can increase the streak
140 they have held on the app by practicing and completing lessons regularly. This gives the users a sense of achievement
141 and encourages them to continue practicing. Users earn experience points, unlock new levels, and compete with friends.
142 Integration of such features can and has drastically increased user engagement and retention by leveraging intrinsic
143 motivators and creating immersive experiences [7].
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146 Older studies regarding Gamification in mental health applications found that it was not used as a common strategy for
147 promoting behavior change and improving mental well-being and that its effect on individuals needed to be studied,
148 and further research was required [11]. Cheng et al. [9] (2019) also suggested that several gamification elements,
149 like "randomness", "artificial challenge", "artificial assistance", "exploratory or open-world approaches", and "social
150 cooperation", are underutilized in the domain and that further research is needed to know how these elements may be
151 put to use to improve mental health and well-being, if at all.
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Several newer studies have examined the effectiveness of Gamification in mental health applications, particularly in addressing conditions such as depression. A systematic review and meta-analysis conducted by Six et al. [18] (2021) found that Gamification significantly improved user engagement and adherence to mental health interventions compared to non-gamified approaches. By incorporating rewards, challenges, progress tracking, and social interaction, gamified mental health apps foster a sense of achievement, enjoyment, and motivation among users, encouraging continued participation and interaction with the platform [7].

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Furthermore, qualitative studies have highlighted the potential of Gamification to facilitate engagement in universal school-based digital mental health solutions. By incorporating gamified elements such as points, levels, and badges, these interventions effectively capture the attention and interest of students, motivating them to participate actively in mental health promotion activities [4]. Additionally, gamification techniques such as nudging have been proposed as effective strategies for improving user engagement in mental health and well-being interventions. By subtly influencing user behavior and decision-making, nudges encourage individuals to engage with the application and adopt positive health-related behaviors [3].

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In conclusion, while gamification presents a promising solution for enhancing user engagement in mental health applications, there are still several gaps in the existing literature. Further research is needed to investigate the long-term effects of gamification on user engagement and mental health outcomes. Additionally, a large part of existing research is focused on the effectiveness of gamification in specific populations or contexts, like depression or school-based interventions. More studies are needed to determine the generalizability of findings across diverse populations. There is also almost no reliable data regarding potential drawbacks of gamification in mental health interventions, such as gaming addiction or increased stress levels. Addressing these gaps will contribute to a deeper understanding of gamification's potential and limitations in improving mental health interventions and user outcomes.

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5 PACT ANALYSIS

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(1) People:

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- Users: The target users of the app, such as individuals seeking mental health support, therapy, or personal development. Considering their demographics, psychographics, and specific needs or challenges related to mental health.
- Therapists: The therapists or counselors who will be providing therapy sessions through the app. Considering their qualifications, expertise, and experience in delivering online therapy and supporting users in a digital environment.
- Community: The communities associated with the app that provide peer-to-peer interaction, group activities, and social networking features. Considering how users can engage with each other to share experiences, provide support, and foster a sense of belonging.

(2) Activity:

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- 209 ● Gamified Activities: Gamified activities and features within the app designed to promote mental wellness,
210 encourage positive behaviors, and tracking progress towards mental health goals. Considering gamification
211 elements such as challenges, rewards, achievements, levels, and social competition.
212 ● Self-Help Tools: The self-help tools and resources available to users for managing stress, anxiety, depression,
213 and other mental health concerns. Considering how these tools complement therapy sessions and help
214 users to practice self-care.

215 (3) **Context:**

- 216 ● Digital Environment: The digital environment in which users interact with the app, including their location,
217 device preferences, and internet connectivity to ensure that the app is accessible and user-friendly across
218 different contexts, such as at home or on-the-go.
219 ● Cultural Sensitivity: Recognizing the cultural factors that may influence users' attitudes, beliefs, and
220 preferences regarding mental health and therapy. Altering the app's content, language, and imagery to
221 promote inclusivity.
222 ● Privacy and Confidentiality: Concerns related to privacy and confidentiality in the context of mental health
223 services.

224 (4) **Technology:**

- 225 ● Platform Features: The app's technology infrastructure and features, including its user interface, navigation,
226 and functionality.
227 ● Data Management: Collection, storage and management of the user data within the app. Data encryption
228 and secure authentication to safeguard user privacy and comply with regulatory requirements.
229 ● Integration with Therapy Services: Integration with existing therapy services, therapists, and medicine
230 platforms to facilitate seamless communication and collaboration between users and therapists to enhance
231 the delivery and continuity of care.

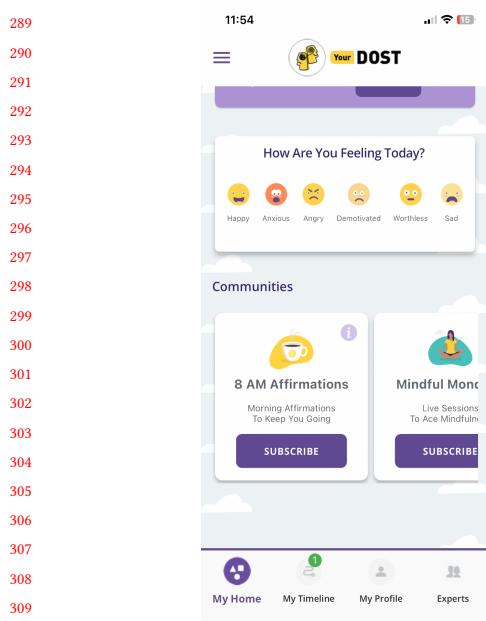
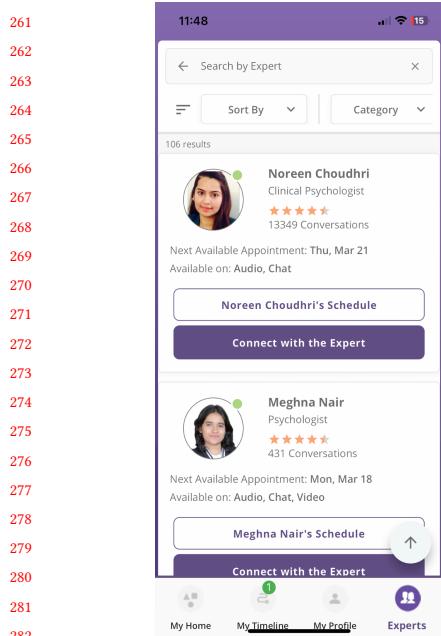
232 **6 COMPETITIVE ANALYSIS**

233 **1. YourDOST:**

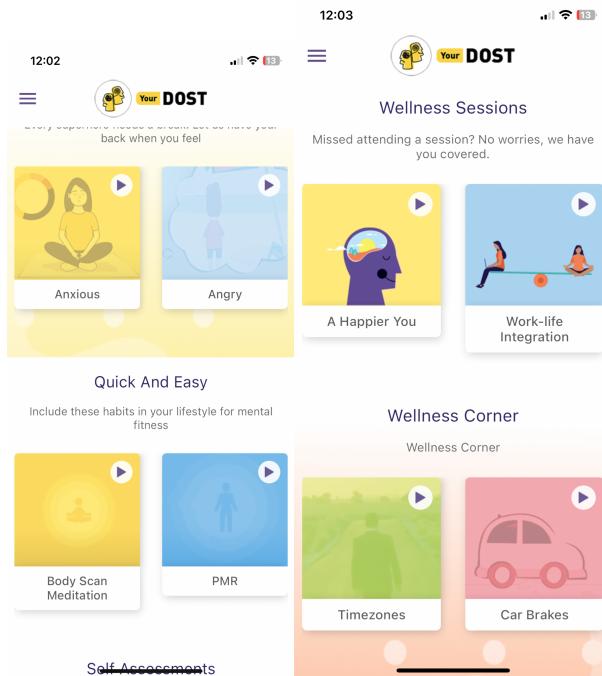
234 YourDOST is an online mental health platform dedicated to providing accessible and convenient mental health
235 support and resources to individuals seeking to improve their emotional well-being. With a user-friendly interface and
236 a range of services tailored to meet diverse needs, YourDOST strives to empower users on their journey towards better
237 mental health.

238 **Product Features:**

- 239 1. A live CHAT or an appointment for an audio or video session with an expert of the user's choice. The
240 user can use the website or the mobile app to either book a session or start a chat with the online
241 experts.

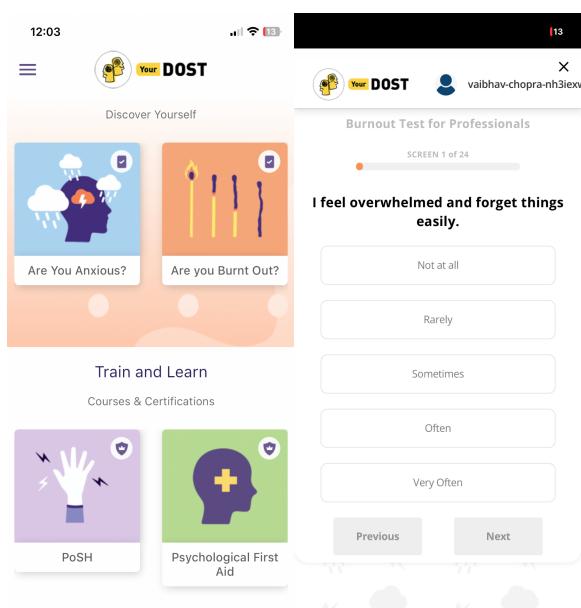


- 313 3. Explore and learn from the wide collection of stories, graphics and videos.



338 The app offers multiple resources like stories, videos and blogs to help users overcome their issues.

- 339 4. Interactive Tests to evaluate user's mental health.



Product Comparison:

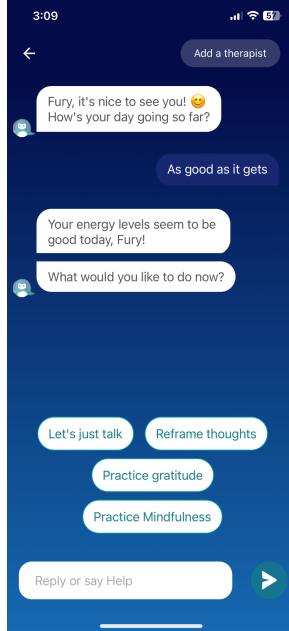
- **Gamification Interaction:** The YourDOST app is only integrated with a few interactive features like tests and therapy sessions. Our app is bundled with various features-
 - Daily Challenges: Daily challenges or quests related to mental health goals such as practicing mindfulness, journaling, or engaging in physical activity.
 - Progress Tracking: Visual progress tracking features that allow users to monitor their mental health goals over time.
 - Interactive Stories: Stories or scenarios within the app that simulate real-life situations related to mental health challenges. Users can make choices and navigate through the story, with outcomes influenced by their decisions.
 - Avatar Customization: Users can create and customize their own avatars within the app. Users can earn virtual currency or items by completing tasks or reaching milestones, which they can use to personalize their avatars. This adds a fun and interactive element to the app experience.
 - Mindfulness Mini-Games: Mini-games or activities focused on promoting mindfulness and relaxation techniques such as deep breathing, guided meditation, or progressive muscle relaxation. These mini-games can serve as quick stress-relief tools that users can access whenever they need a break.
- **Therapy Services:** Both the apps provide offline and online therapy sessions with experts with a personal chat or a video call.
- **Pricing Strategy:** Both the apps are completely free to use for their online services, and are paid for the offline therapy sessions.

2. Wysa

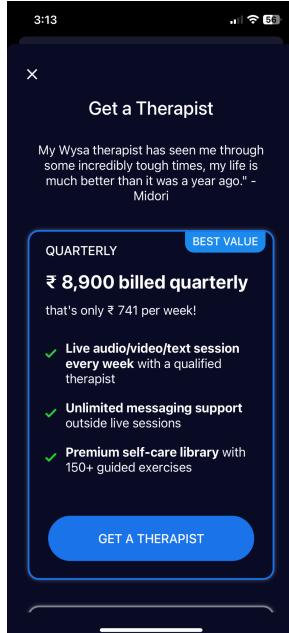
[Wysa](#) is an AI-powered mental health app designed to provide users with emotional support, self-help tools, and therapeutic techniques to improve their well-being. With a variety of tools and techniques rooted in evidence-based therapy, Wysa provides personalized support to help the user build resilience, manage emotions, and live a happier, healthier life.

Product Features:

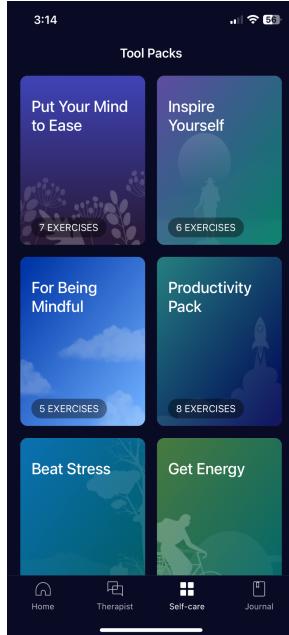
- 417 1. Emotional Support: Chat feature with AI Wysa anytime, anywhere, and receive empathetic responses
 418 and evidence-based techniques to help the user navigate life's challenges.



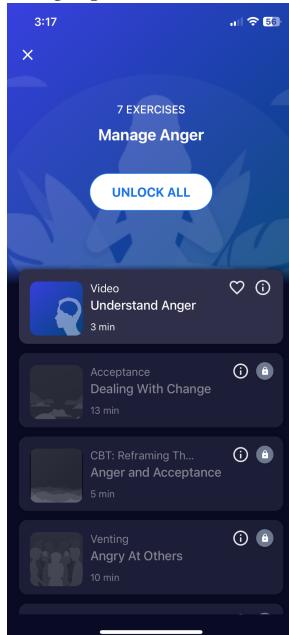
- 441 2. Therapy Sessions with experts: The user can book online therapy sessions with highly qualified
 442 experts for more personalized experience.



- 469 3. Self-Help Tools: a wide range of self-help exercises and activities, including mindfulness meditation,
 470 breathing exercises, journaling prompts, and mood tracking tools.
 471



- 493 4. Cognitive Behavioral Therapy (CBT): CBT-based exercises and techniques to challenge negative
 494 thought patterns, reframe unhelpful beliefs, and build healthier coping strategies.
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518 Product Comparison:

- 521 • **Gamification Interaction:** The Wysa app has a lot of interactive features like the AI chatbot but
522 lacks gamified elements that our app provides-
523 - Daily Challenges: Daily challenges or quests related to mental health goals such as practicing
524 mindfulness, journaling, or engaging in physical activity.
525 - Progress Tracking: Visual progress tracking features that allow users to monitor their mental health
526 goals over time.
527 - Interactive Stories: Stories or scenarios within the app that simulate real-life situations related to
528 mental health challenges. Users can make choices and navigate through the story, with outcomes
529 influenced by their decisions.
530 - Avatar Customization: Users can create and customize their own avatars within the app. Users can
531 earn virtual currency or items by completing tasks or reaching milestones, which they can use to
532 personalize their avatars. This adds a fun and interactive element to the app experience.
533 - Mindfulness Mini-Games: Mini-games or activities focused on promoting mindfulness and relaxation
534 techniques such as deep breathing, guided meditation, or progressive muscle relaxation. These mini-
535 games can serve as quick stress-relief tools that users can access whenever they need a break.
536 • **Therapy Sessions:** The Wysa app only provides online therapy sessions with chat/video/text sessions.
537 Our app provides both online and offline services
538 • **Pricing Strategy:** A lot of features of the Wysa app like therapy sessions and half of the Self-Help
539 tools are behind a paywall, with pricing starting at 10\$ a week. Our app provides all the online features
540 free of cost.

541 7 PATENTS AND CONCEPTS UTILISED

542 Several key concepts and principles are used in the development of a gamified version of a mental health application.
543 We have identified concepts from three main broader areas: User-Centered Design, Gamification and Digital Health and
544 Behavioral Science.

545 Robson et al. [16] (2015) point to the importance of incorporating game design elements into non-game contexts
546 to increase user engagement. The application can then leverage motivational drivers such as autonomy, mastery, and
547 purpose while integrating game mechanics like points, badges, and levels to provide feedback and encourage desired
548 behaviors. Personalization based on user preferences and goals should be a central focus, ensuring that gamified
549 elements resonate with individual users.

550 Conducting thorough user research also becomes paramount, enabling the identification of specific mental health needs,
551 challenges, and preferences. Users should be actively involved through an iterative design process from initial concept
552 development to usability testing. Personalization should extend beyond content to encompass the app's features and
553 gamified elements, ensuring that the application is intuitive, accessible, and relevant to users of diverse backgrounds
554 and abilities [17].

555 Finally, as highlighted by Eysenbach [12] (2005) and Christensen and Mackinnon [10] (2006), addressing the challenge
556 of attrition requires strategic intervention to sustain user engagement over time. By understanding factors influencing
557 attrition, such as usability issues, perceived lack of benefit, or competing demands, the application can implement
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573 strategies to promote continued usage. This includes ongoing monitoring of user engagement metrics and iterative app
574 refinement based on user feedback and usage data.
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576 By integrating these principles into the development process, the gamified mental health application can effectively
577 support users' mental well-being while fostering sustained engagement and positive outcomes.
578

580 8 REQUIREMENT GATHERING

581 8.1 User Requirements

- 583 (1) **Engagement and Interactivity:** Users require an interface that maximizes the fun factor in an app without
584 compromising its functionality.
- 585 (2) **Personalization:** Users prefer apps that cater to their preferences and provide personalized suggestions relevant
586 to their needs.
- 587 (3) **Ease of Use:** Users value an interface that is easy to use, as it enhances their overall experience.
- 588 (4) **Wide Range of Features:** Users expect apps to offer a variety of features to cater to a diverse user base.

592 8.2 Functional Requirements

- 594 (1) **Daily Challenges (Gamified):** Incorporate daily quests related to mental health goals, such as mindfulness,
595 journaling, and physical activity.
- 596 (2) **Mood Tracking/Progress Tracking:** Provide functionality for users to monitor their mood over time and
597 track progress with mental health goals.
- 598 (3) **Interactive Stories:** Include story-based scenarios within the app that simulate real-life situations related to
599 mental health challenges.
- 600 (4) **Custom Avatars and Virtual Currency:** Allow users to select custom avatars and earn virtual currency for
601 completing goals.
- 602 (5) **Personalized Recommendations:** Implement algorithms to provide personalized recommendations based on
603 user interactions, preferences, and goals.

607 8.3 Environmental Requirements

- 609 (1) **Cross-Platform Compatibility:** Ensure the app is accessible across various platforms (iOS, Android, web) to
610 accommodate all users.
- 611 (2) **Privacy and Security:** Implement privacy measures and data encryption to protect user data and comply with
612 regulations such as GDPR and HIPAA.

615 8.4 Usability Requirements

- 617 (1) **Intuitive User Interface (UI):** Design an easy-to-use interface with clear instructions and minimal ambiguity
618 about navigation.
- 619 (2) **Accessibility Features:** Incorporate basic accessibility principles to address potential usability issues for users
620 with disabilities.
- 621 (3) **Onboarding Process:** Use graphics and animations to facilitate the onboarding process and help users quickly
622 grasp app concepts.

- 625 (4) **Customization Options:** Provide users with customization options to enhance usability and make them feel
626 more in control of the app.
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641 9 PERSONAS

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643 Jessica's persona

644 Demographics

645 Name: Jessica
646 Age: 24,
647 graduate student,
648 New delhi
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658 Pain Points & Frustrations

- 659
660 • Struggles to prioritize
661 mindfulness and
662 introspection/self-care
663 due to a demanding
664 academic schedule.
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Behaviors & Habits

- Finds guided meditation a good way to manage anxiety and stress related to academic pressures.
- Tries to practice mindfulness

Needs & Goals

- Would like to journal and track her mood and general well being over time.
- Wants to have a better lifestyle and a greater understanding of her self.

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Himesh's persona

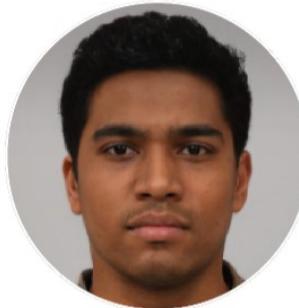
Demographics

Name: Himesh

Age: 38,

Male

Yoga instructor,
New delhi



Pain Points & Frustrations

- Struggles with finding apps that provide a repository of good literature on mental and spiritual well being.

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Behaviors & Habits

- Regularly uses mental health apps to enhance mindfulness and emotional well-being.
- Values features like guided meditation, breathing exercises, and mood tracking for holistic wellness.

Needs & Goals

- Seeks mental health apps that align with his holistic lifestyle and support his mindfulness practices.
- Values apps with a strong emphasis on mindfulness and spiritual well-being.

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Demographics

Name: Ashish

Age: 32,

Male

Marketing manager,
New delhi



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Pain Points & Frustrations

- Struggles with consistency in app usage due to competing work priorities.

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Behaviors & Habits

- Uses mental health apps sporadically due to a hectic schedule.
- Values features like guided meditation and mood tracking for quick stress relief.

Needs & Goals

- Seeks convenient and easy-to-use apps to manage stress during busy work periods.
- Is looking for apps that offer flexibility and can fit into his schedule seamlessly.

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Rohan's persona

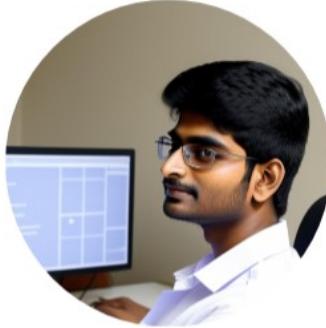
Demographics

Name: Rohan

Age: 29,

Male

Software engineer,
New delhi



Pain Points & Frustrations

- Can't use app consistently due to competing personal and professional commitments.

Behaviors & Habits

- Uses mental health apps to manage stress and anxiety.
- Appreciates gamified elements like challenges and rewards for enhancing engagement.

Needs & Goals

- Seeks mental health apps that incorporate gamification to make self-care more enjoyable and motivating.
- Requires apps with clear progress tracking and personalized recommendations.

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10 INTERVIEW ANALYSIS (QUALITATIVE)

Click [here](#) to access the transcript.

(1) Experience with Mental Health Apps:

- Most participants are aware of meditation and mindfulness apps, not mental health apps per se.
- People are generally very inconsistent in their usage of such apps. This discovery further fuels our conception that these apps lack user retention and engagement.

(2) Mental Health and Gamification:

- An understanding of what mental health and gamification mean to people.
- People relate mental health with emotional, psychological and social well-being.
- Participants described gamification as incorporating game-like elements into apps and other technologies with different contexts.

(3) Perception of Gamification in Mental Health Apps:

- There is a unanimous agreement that gamification would make mental health apps more effective and fun to use.
- Most participants believe gamification has the potential to make these apps more interactive and convivial.
- Features such as challenges, rewards, progress tracking, animated interfaces, and leaderboards lead to piqued user interest.

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(4) Preferences and Needs:

- Personalization of any technology makes it more desirable.
- One participant highlighted that looking for good therapists near him is painstaking.
- Social features like online support groups might be a good addon.

(5) Frustrations:

- Lack of consistently reliable information sources on mental health issues.
- Online solutions or platforms for dealing with mental health issues are often drab and not fun to use.
- The perceived utility of such apps is also poor.

(6) Concerns and Suggestions:

- One big concern is that gamification might overshadow actual therapy-related content.
- Looking at stress, anxiety, and depression as parts of the same bracket might not be a good idea.

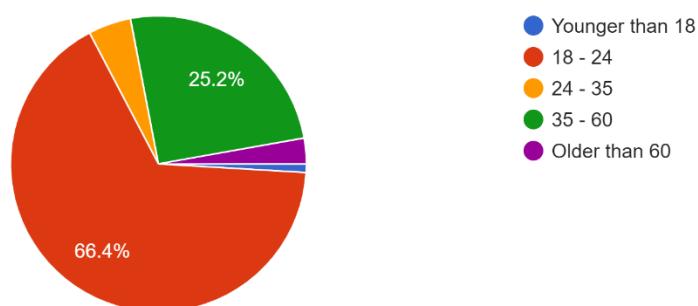
Overall Analysis: The analysis highlights users' perceptions of mental health apps. Generally speaking, people are neutral about using them (from what our survey data tells us). They have concerns about the effectiveness and concreteness of such solutions to mental health issues. Gamification is perceived positively, and people immediately relate to the concept and find it useful for enhancing engagement. The balance between gamification and the content of actual substance is another concern that users have. Additionally, users' preferences for personalized features emphasize the need for customization options to cater to diverse user needs and preferences.

11 SURVEY ANALYSIS

Demographic questions relevant to our study:

What is your age?

107 responses



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Which of the following options best describes your current employment status?

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107 responses

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We interviewed a good mix of people from different sections of the job spectrum and age groups to paint a comprehensive picture. The sample may be slightly biased, with the most responses coming in from students aged 18-24 because it is the most accessible section for us. Despite the bias, the picture might not be skewed because the user base of such apps includes a similar proportion of a young population, as shown below:

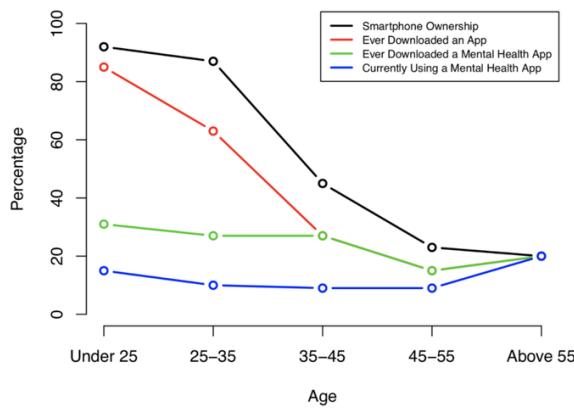
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Source: [link](#)

The graph above shows how smartphone ownership and mental health app downloads decrease with age

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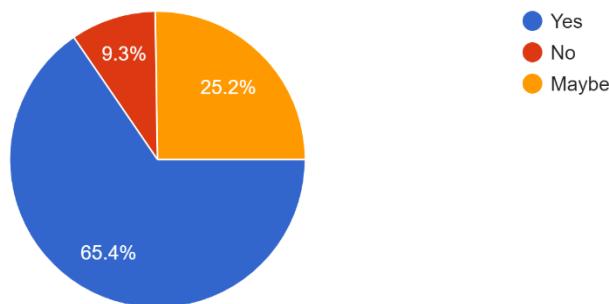
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Have you ever experienced stress, anxiety, or depression?

107 responses



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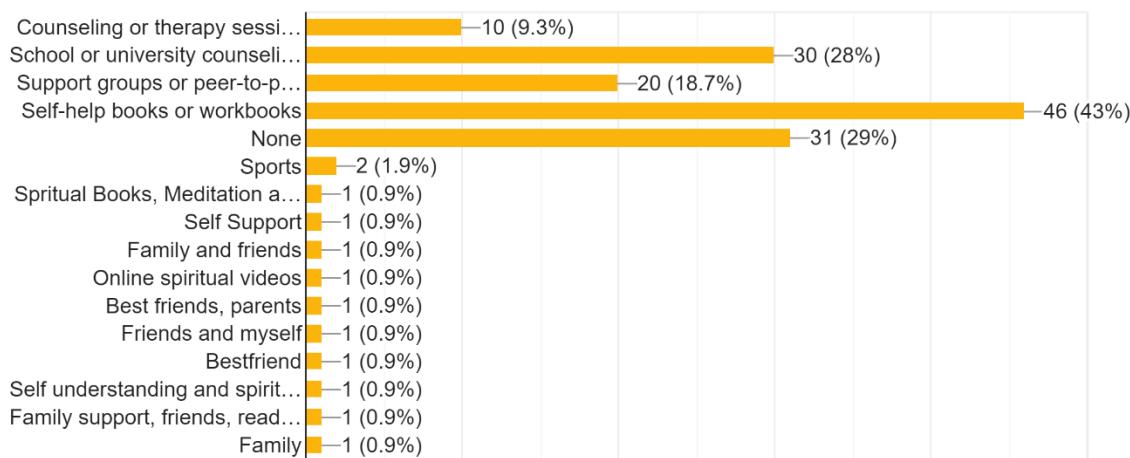
This mapping of the responses is self-explanatory. Most people who took our survey (65.4%, to be precise) have experienced stress, anxiety, or depression in their lifetime.

The interesting section here is the 25.2% of people who responded with "maybe." A staggering proportion of people do not know if they had such issues in the past. Our app aims to help such people identify with the common issues other people have faced or are still facing.

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What kind of mental health support is available to you ?

107 responses



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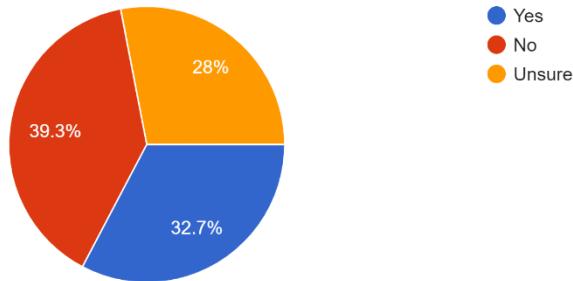
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989 Here, 31 respondents admitted to having no mental health support system at all. An app might reduce the friction
 990 between these people and some kind of help. Self-help books or workbooks are the most common resources used in this
 991 regard. We aim to provide a curated collection of literature on mental health and aid users in finding better resources.
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993 Do you feel hesitant about seeking help from an offline psychologist or accessing face-to-face
 994 therapy?
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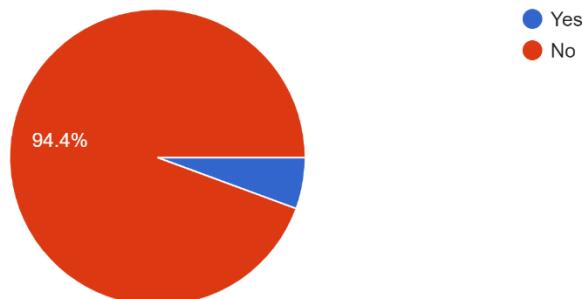
996 107 responses
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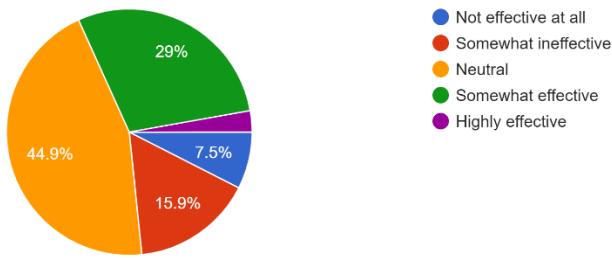
1010 This question delves deeper into the reasons why people do not have robust support systems. One of the biggest
 1011 reasons is hesitance (also misinformation). As mentioned earlier, an app might make it easier for people to consult, say,
 1012 a therapist over the internet for minor mental health issues (some of which they may not even be aware of). The app
 1013 would also recommend well-reputed psychiatrists nearby for offline consultation.
 1014

1016 Have you ever used a mental health app before?
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1018 107 responses
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 1042 To what degree do you think mental health apps are effective for managing mental health issues?
 1043 107 responses

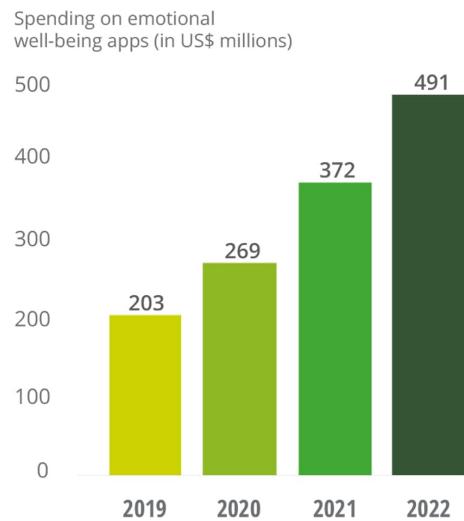


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 1056 The data above is for mapping the perceived efficacy of mental health apps. Most people have never used a mental
 1057 health app before, although during the interviews we realized that a lot of these people might have used meditation
 1058 apps or apps that help them with their well-being in some way. We see this as untapped potential. Especially given that
 1059 mental health apps have seen definite growth recently.

FIGURE 1

Mental health and well-being apps will see strong growth through 2022

Global spending on mental health and
well-being mobile apps, 2019–2022, US\$ millions



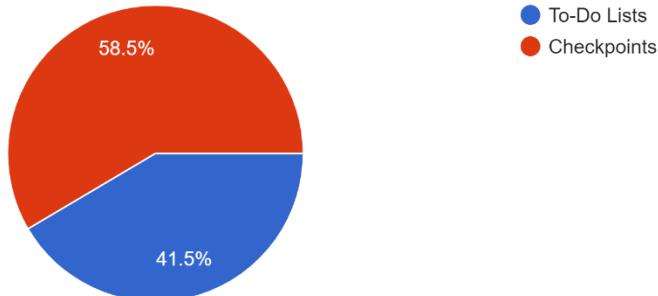
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 1068 Note: Spend estimates for 2021 and 2022 are predictions.
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 1070 Source: SensorTower, Mobile Wellness Market Trends 2021.
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 1072 Deloitte Insights | deloitte.com/insights

1093 “To meet growing demand and capture interested audiences, mental health app creators and developers can pursue
1094 novel methods for monetization, such as subscription tiers or tailored paid programs and offerings. They could also
1095 explore personalizing these services for users and customizing apps to encourage regular use and check-ins.”
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1097 Source: [link](#)

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1099 Which of the following interfaces would you be more likely to use?

1100 106 responses



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1111 We showed the respondents two interfaces. The one with checkpoints was gamified. This helped us gather that
1112 people naturally like gamified interfaces.
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1145 12 JUSTIFICATION OF METHODS, PROCESSES AND SOURCES

1146 We adopted a mixed-methods research design to gather insights on the topic. The use of a mixed-methods design enabled
1147 us to combine qualitative and quantitative approaches, providing a comprehensive and nuanced understanding of the
1148 research problem. A survey via Google Forms was circulated among people. This survey aimed to collect quantitative
1149 data on peoples' opinions on mental health and applications used to improve the same. The survey observed 107
1150 responses. We have also carried out interviews with five individuals. The participants were recruited through snowball
1151 sampling. The interviews were conducted over Google Meet, and the interview transcripts were further analyzed. The
1152 interviewees provided both written and verbal consent for the interview.
1153

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1155 Alternative approaches were considered, such as observational and diary studies, but interviews and surveys were
1156 selected for their ability to provide in-depth insights into user experiences and preferences.
1157

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1159 **Survey** - Considering the standard survey design guidelines, a short and engaging online survey was designed.
1160 The survey explored multiple aspects of the topic at hand and the related context, such as the demographics of the
1161 participants (two questions), users' knowledge regarding and willingness to seek mental health (three questions),
1162 opinions on the use of mental health applications as a tool to improve mental well being (two questions) and user
1163 preferences regarding the user interface of the application (one question). Such themes were covered to enable us to
1164 establish the background of common user perceptions, challenges, and expectations from an application designed to
1165 help people improve their overall mental well-being. The estimated time of completion for the survey was 2-3 minutes,
1166 which assisted in preventing participants from avoiding the survey due to an excess of questions. The survey utilized
1167 single-select and multiselect options along with textual response fields wherever required, allowing qualitative and
1168 quantitative data to be collected. The survey was circulated among university students, working professionals, and
1169 other individuals using multiple channels, including private channels and word-of-mouth. Responses to the survey
1170 were analyzed and utilized further in the study to gain insights and to frame the interview questions.
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1173 **Interviews** - The interviews aimed to comprehend people's mental health needs, challenges, and preferences, providing
1174 qualitative insights into their experiences with existing mental health applications and services. Participants were
1175 encouraged to share their perspective on what mental health means to them, highlight their experience with any mental
1176 health applications, if any and list any features they would like to see in any such app if they were given a chance to
1177 use one. They were probed to share their opinions about the motivation behind a person using a mobile application
1178 regularly and what they understood by the term 'Gamification'. Semi-structured interviews conducted over Google
1179 Meet built upon the research questions established and refined using the initial findings from the survey. The interview
1180 maintained the survey's theme while enabling deeper insights due to its personalized, one-on-one nature, overcoming
1181 the limitations of the brief survey format. However, the sample population for the interviews lacked diversity, mainly
1182 comprising four college students and one school student, potentially introducing bias into the findings. A total of six
1183 questions were included in the structure of the interview.
1184

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1186 **Data Analysis** - The interviews were transcribed word-for-word by the team members. This was followed by a
1187 Thematic Analysis of the collected data. The survey responses were coded and grouped under themes. The final themes
1188 from the surveys and interviews informed our findings and discussion.
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Literature review - The literature review was conducted to provide a comprehensive understanding of existing research and knowledge relevant to the development of gamified mental health applications. A systematic search strategy was employed to ensure a thorough review, utilizing Google Scholar as the primary source for looking for relevant literature. The search strategy involved using Boolean expressions to refine search queries and narrow down results. Boolean operators such as "AND," "OR," and "NOT" were used to combine keywords and phrases related to gamification, mental health, user-centered design, and digital health interventions. For example, some of the search queries included combinations like "gamification AND mental health," "user-centered design OR digital health," and "mental health interventions NOT medication." We used Zotero to keep track of all the relevant articles and papers we collected.

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Furthermore, papers with high citation counts were prioritized while selecting relevant literature, indicating their influence and relevance. In addition, a wide variety of sources were chosen, including journal articles, conference papers, online articles, blog posts, and other relevant sources of information.

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The literature review itself was divided into various stages. We first defined a problem statement for the study, which helped us clearly define the focus and purpose of the literature review. We then identified any themes and patterns from the literature collected. Lastly, we broadly divided the review into five parts: the introduction, the problem, the evidence, the solution and the conclusion. Each section served a specific purpose, facilitating a comprehensive evaluation of existing knowledge and informing the development of the gamified mental health application.

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13 EVALUATION PLAN

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(1) End Goal:

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- The end goal of the project is to improve users' mental well-being by providing accessible, engaging, and effective mental health support through a gamified app that offers therapy sessions (both online and offline).

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(2) Evaluation Metrics:

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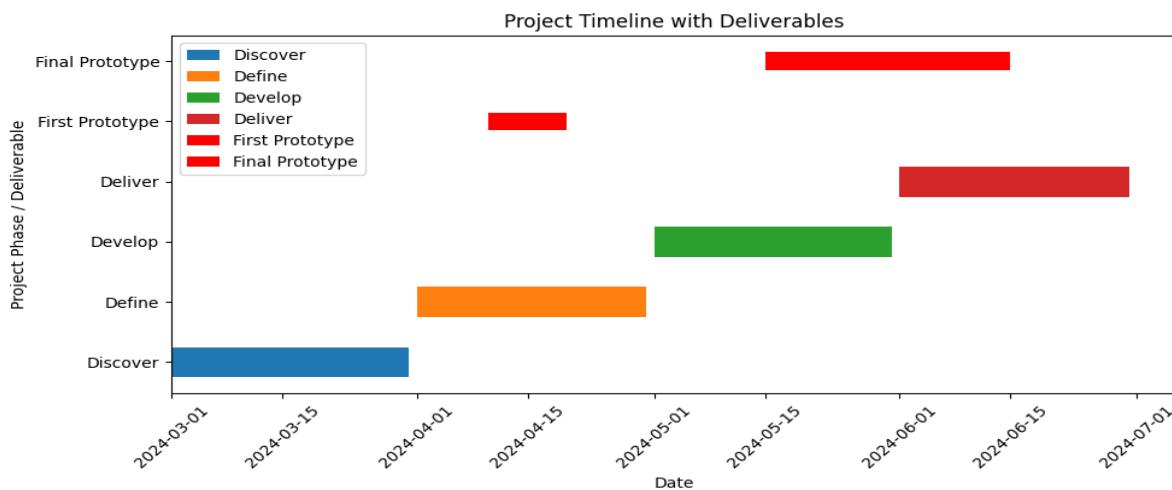
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- Gamification Effectiveness: Assessing the effectiveness of gamification features in promoting positive behaviors and mental wellness. Tracking metrics such as completion rates for gamified challenges, user feedback on gamification elements, and changes in user behavior over time.
- Measuring user satisfaction with the app and therapy services through surveys, ratings, and reviews. Gathering qualitative feedback on user experiences, perceived benefits, and areas for improvement.
- Retention and Long-Term Engagement: Monitoring whether users continue to use the app and engage in therapy sessions over an extended period.

1249 14 TIMELINE AND APPROACH



15 CONTRIBUTIONS

Shamik sinha: Motivation, literature review, patents and concepts, gantt chart, justification
 Tejus: Problem statement, vision, interviews, surveys, analysis, requirement gathering, personas
 Vaibhav: proof of significance, abstract, PACT framework, competitive analysis, evaluation plan

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