



UNIVERSITI
TEKNOLOGI
MARA

Cawangan Negeri Sembilan
Kampus Seremban
Fakulti Pengurusan dan Perniagaan

**FBM-SEREMBAN INTERNATIONAL INNOVATION
COMPETITION (FBM-SIIC)**

INVENTOPIA 2023

EXTENDED ABSTRACT BOOK



"IDEAS UNLEASHED: THE ULTIMATE INNOVATION CHALLENGE"
inventopiafbmsiic.wixsite.com/home

ORGANISED BY:

**FACULTY OF BUSINESS
AND MANAGEMENT
UNIVERSITI TEKNOLOGI MARA
NEGERI SEMBILAN,
SEREMBAN CAMPUS**

eISBN 978-629-97586-8-6

ASSIST YOUR PERSONAL WELLNESS AND SELF-CARE WITH ARTIFICIAL INTELLIGENCE BUDDY: *ALIVE*

* Zuhal Hussein¹, Che Nur Asmani Amirah Che Mohd Naw¹, and Che Nur Asmani Amira Che Mohd Naw¹

¹Universiti Teknologi MARA Cawangan Kelantan, Kampus Kota Bharu

* *Corresponding author's email: zuhal@uitm.edu.my*

ABSTRACT

In today's swift world, maintaining personal wellness has become an extreme concern. Artificial intelligence (AI) has emerged as a powerful ally in this endeavour, offering innovative solution through mobile health applications. This mobile health application diary 'Alive' explores the concept of AL buddy, a mobile health application designed to assist individuals in enhancing their personal wellness and self-care routines. 'Alive' diary leverages the capabilities of AI to provide personalized support across various functions of personal wellness, including mental well-being, physical health, and lifestyle management. Through the artificial intelligence-driven algorithms, the mobile health application analyses user data, such as sleep patterns, food intake, daily activities levels, diet preferences, stress indicators, and meditation, to provide tailored recommendations and insights. The key features of Alive diary include real-time health monitoring through wearable devices, such as smartphone and smartwatches, and mental health support through AI chatbots, medication management reminder, sleep pattern, health management such as exercise, healthy food, social support, and access to telehealth services. The applications also aid in health behavioural change and promote healthy lifestyle. In addition, Alive diary buddy empowers users to customize their sleep pattern, fitness routines, access to healthcare information, have to-do list, and other interfaces with engaging design. It optimizes the potential of the application as a comprehensive tool for encouraging personal wellness and self-care, bridging the gap between individuals and healthcare resources. By tackling the potential of Alive diary buddy, this mobile health applications paves the way for a healthier, more proactive, more informed, and well engaged approach to self-care in the digital age, the era of digital health.

Key Words: Artificial intelligence, mobile health application, health diary, wellness, self-care

1. INTRODUCTION

Initially, information technology systems were primarily utilized for documenting patient information. However, the rapid advancements in technology over the years have paved the way for the application of data analytics and machine learning (ML) in the healthcare sector (Bhatt et al., 2022). The integration of advanced artificial intelligence (AI) techniques with the rapid adoption of medical Internet of Things (IoT) devices has spurred increased research in the fields of digital healthcare and preventive medicine (Barrett et al., 2019). This research focuses on mobile health (mHealth) applications, which are employed to monitor serious conditions such as asthma, diabetes, and sleep apnea, ensuring the well-being and safety of patients (Guillodo et al., 2020). mHealth has emerged as a critical sector within the healthcare information technology industry, experiencing significant growth in recent years. This growth has been driven by the proliferation of wearable technologies, mobile sensors, and the exponential increase in the number of IoT devices in general (Tang & Ho, 2019).

Mobile diary apps have been utilized in various fields, including psychology and healthcare, for a number of years. They serve the purpose of documenting behavioural patterns, such as leisure activities and dietary habits, and are sometimes employed as tools to gain insight into the emotions and motivations associated with these behaviours (Nurmi et al., 2020). The widespread use of

smartphones, which people carry with them throughout most of the day (Bol et al., 2018; Klasnja & Pratt, 2012), has made these devices invaluable for self-reported measurements. Consequently, there is an increasing trend to harness their advantages in behavioural studies as alternative technologies for collecting self-reports.

Mobile apps can also issue prompts to users to ensure they complete their journal entries, enable real-time reporting tracking, and filter out retrospective reporting. Another benefit of using mobile diaries is the absence of stringent physical space requirements in contrast to traditional paper diaries (Jimoh et al., 2018). Data can be sent back and processed online in a transparent manner, unlike paper diaries, which encounter logistical challenges in terms of distribution to users and subsequent collection by research teams. Furthermore, due to the time elapsed before all diaries are received and processed, the publication of data may be subject to delays.

As a fast-growing area of mobile health applications, health diary apps have been increasingly used by people beyond the use of conventional to-do lists. A health diary app is a mobile application designed to help individuals maintain a record of their health-related information and activities. These apps are typically used for tracking and managing various aspects of personal health and wellness. Common features that can be benefited from health diary apps include symptom tracking, tracking, and monitoring sleep patterns, diet and nutrition logging, stress indicators, meditation management, as well as journaling users' feelings, experiences, and thoughts related to health and well-being driven by the artificial intelligence algorithm.

Artificial intelligence (AI) refers to creating computer systems that can carry out functions traditionally associated with human intelligence, including tasks like perception, reasoning, and decision-making (Dave & Patel, 2023). Within the healthcare domain, AI is harnessed for the analysis of extensive patient data, encompassing medical records, diagnostic images, and laboratory findings, with the aim of enhancing clinical decision-making and enhancing patient outcomes. Machine learning is a subarea of artificial intelligence that involves the development of models and algorithms that can learn from data.

The synergy between AI and mHealth technologies plays a pivotal role in advancing the establishment of remote healthcare infrastructure, offering enhanced insights to medical professionals, and serving the well-being of countless patients. Therefore, AI in health diary apps can help personalize users' health information and data, such as medical records and lifestyle information. Prior research focusing on the application of AI and health diary apps on personal health and well-being has found a significant impact on the use of health diary apps on various conditions. For example, Shim & Hwang, (2016) found that the experimental groups showed significantly higher scores for exercise-related self-efficacy and self-care adherence after using a calendar-typed health diary. Compared to paper diaries, health diary apps such as dietary apps are easier to use and effective in regard to recording data and are less time-consuming, but frequently come with technical issues and a boring interface (Jimoh et al., 2018).

2. METHODOLOGY

This present study was a developmental study to design and develop a mobile-based self-care application to help individuals maintain a record of their health-related information and activities as well as for tracking and managing various aspects of personal health and wellness. The design and development of the Alive mobile diary app were conducted in three main phases:

2.1 Identify potential users and platform.

To identify the potential users who will use this mobile diary app, the study has blasted a short and simple online survey to the general social media users on several platforms, such as Facebook, Instagram, WhatsApp, and Twitter. In the survey form, the social media users were asked several questions, which are: *type of mobile operating system used by the users, such as Android or iOS; do you have experience using personal wellness and self-care app or are you currently using the app;*

what kind of features are important to the mobile-based self-care app; are you using the personal wellness and self-care app for a specific purpose? This survey assisted in generating ideas, focusing and leading the development of features and the design of the Alive mobile diary app.

2.2 Determine the key features and capabilities.

To identify and determine the key features and capabilities of the Alive mobile diary app, the study used the data obtained from the survey done in phase 1. Several personal wellness and self-care diary applications were downloaded and examined. The information and data gathered from the survey and the applications were combined and analyzed. A checklist of the required key features and capabilities of the personal wellness and self-care application was prepared and presented to the members. A list of key features was finalized to assist in creating prototype for the Alive mobile app. Based on the key features of similar available mobile diary applications, the study has identified the design and development of the mobile diary application were divided into two parts: first for user registration and profile, and the second is home page for daily uses and features of the apps.

2.3 Design and development of Alive App

The design and development of the Alive mobile diary app focused on personal wellness and self-care assistants consisted of determining the model for the app, accessibility, and users' expectations, designing the prototype, preparing the initial version, and finalizing the actual version. The study used UI/UX software to create the mobile app prototype, the original version, and databases. After receiving the users' information, the app will keep the user's data and send the information to databases before sending a notification to the user's mobile phone. The users will be able to save, edit, and update their information and profile at any time. After completing the profile and users' information, the users can start using all the features for updates, keying information, checking status, and others. Importantly, the Alive app will set user limit access so that only one username and profile can be used for one user. This limit is to protect the users' privacy, data, and security while using the app. The Alive health diary app is available for download from the Google Play Store for Android users.

3. RESULT & DISCUSSION

We have identified the core model and a set of functions for the Alive health diary app. To use the app, users must create an account during their initial login after installation. Once registered using email, they can log in by providing a username and password. One of the important features of the Alive app is the personal health record, which allows users to record information about their health, illnesses, and journals. Users can simply view and manage their information in their user profile. This app will be developed using the JAVA programming language and the Android operating system (AOS), which is more cost-effective due to the widespread adoption of smartphones. Through the content analysis of different mobile dairy applications in mobile stores and the survey by the authors, several features will be extracted into the app, and users can choose features they want to track, such as social, hobbies, daily diary/journal, sleep, health, food, meditations, physical exercise, and others.

Utilizing health diaries, particularly through smartphone applications, offers individuals a way to overcome the haziness of their memory, assess their health objectively, and identify their healthcare needs (Shim & Hwang, 2016; Wolf et al., 2016). Smartphone-based health diaries are effective in enhancing the lifestyles of chronic patients and yield higher user satisfaction compared to traditional paper diaries, largely due to their greater flexibility in terms of time and space (Yoo & Suh, 2021). Moreover, the dependable content within these diaries makes them a reliable source of data. In summary, the use of application-based health diaries can be a key strategy for encouraging patients to actively engage in self-care, enabling them to regularly monitor their health status, and instilling confidence in managing their medical conditions (Jimoh et al., 2018). Thus, with the benefits of health

diary apps towards personal wellness and self-care as discussed, we aim to develop the desired applications for this purpose.

A mobile health diary app is of paramount importance for our personal well-being because we cannot manage everything on our own. Hence, having an assistant that aids us in overseeing and maintaining our individual health and wellness is indispensable. This app serves a critical role in health monitoring, disease management, and empowering us to be in charge of our well-being, among other functions. Therefore, it plays a crucial part in enhancing and sustaining our overall health. An advanced health diary, enhanced by artificial intelligence, will assist us in monitoring, managing, and comprehending our health, ultimately resulting in improved well-being.

4. CONCLUSION AND RECOMMENDATION

In this research, we have designed and crafted a health diary app specifically tailored for adults. This innovative app exhibits promise in addressing the limitations observed in existing mobile applications geared towards health daily diary. By employing our *Alive* diary app, we can introduce a comprehensive self-care solution, encompassing features such as AI chatbots, medication management reminders, sleep patterns, health management such as physical activity suggestions, healthy food, social support, lifestyle behaviour tracking, and access to telehealth services. Interest in mobile-based self-care diary apps has persisted over the years, with many robust applications yet to be developed. Future research endeavours are warranted to expand the scope of health diary apps covering various facets of personal self-care or specifically for other age groups such as older adults with specific health conditions like cognitive impairment and Alzheimer's disease or children's diaries.

REFERENCES

- Barrett, M., Boyne, J., Brandts, J., Brunner-La Rocca, H. P., De Maesschalck, L., De Wit, K., Dixon, L., Eurlings, C., Fitzsimons, D., Golubnitschaja, O., Hageman, A., Heemskerk, F., Hintzen, A., Helms, T. M., Hill, L., Hoedemakers, T., Marx, N., McDonald, K., Mertens, M., ... Zippel-Schultz, B. (2019). Artificial intelligence supported patient self-care in chronic heart failure: a paradigm shift from reactive to predictive, preventive and personalised care. In *EPMA Journal* (Vol. 10, Issue 4, pp. 445–464). Springer. <https://doi.org/10.1007/s13167-019-00188-9>
- Bhatt, P., Liu, J., Gong, Y., Wang, J., & Guo, Y. (2022). Emerging Artificial Intelligence-Empowered mHealth: Scoping Review. In *JMIR mHealth and uHealth* (Vol. 10, Issue 6). JMIR Publications Inc. <https://doi.org/10.2196/35053>
- Bol, N., Helberger, N., & Weert, J. C. M. (2018). Differences in mobile health app use: A source of new digital inequalities? *Information Society*, 34(3), 183–193. <https://doi.org/10.1080/01972243.2018.1438550>
- Dave, M., & Patel, N. (2023). Artificial intelligence in healthcare and education. *British Dental Journal*, 234(10), 761–764. <https://doi.org/10.1038/s41415-023-5845-2>
- Guillodo, E., Lemey, C., Simonnet, M., Walter, M., Baca-García, E., Masetti, V., Moga, S., Larsen, M., Ropars, J., & Berrouiguet, S. (2020). Clinical applications of mobile health wearable-based sleep monitoring: Systematic review. In *JMIR mHealth and uHealth* (Vol. 8, Issue 4). JMIR Publications Inc. <https://doi.org/10.2196/10733>
- Jimoh, F., Lund, E. K., Harvey, L. J., Frost, C., Lay, W. J., Roe, M. A., Berry, R., & Finglas, P. M. (2018). Comparing diet and exercise monitoring using smartphone app and paper diary: A two-phase intervention study. *JMIR MHealth and UHealth*, 6(1). <https://doi.org/10.2196/mhealth.7702>
- Klasanja, P., & Pratt, W. (2012). Healthcare in the pocket: Mapping the space of mobile-phone health interventions. In *Journal of Biomedical Informatics* (Vol. 45, Issue 1, pp. 184–198). <https://doi.org/10.1016/j.jbi.2011.08.017>
- Nurmi, J., Knittle, K., Ginchev, T., Khattak, F., Helf, C., Zwickl, P., Castellano-Tejedor, C., Lusilla-Palacios, P., Costa-Requena, J., Ravaja, N., & Haukkala, A. (2020). Engaging users in the behavior change process with digitalized motivational interviewing and gamification: Development and feasibility testing of the precious app. *JMIR MHealth and UHealth*, 8(1). <https://doi.org/10.2196/12884>
- Shim, J. L., & Hwang, S. Y. (2016). Development and effects of a heart health diary for self-care enhancement of patients with heart failure. *Journal of Korean Academy of Nursing*, 46(6), 881–893. <https://doi.org/10.4040/jkan.2016.46.6.881>

- Tang, T., & Ho, A. T. K. (2019). A path-dependence perspective on the adoption of Internet of Things: Evidence from early adopters of smart and connected sensors in the United States. *Government Information Quarterly*, 36(2), 321–332. <https://doi.org/10.1016/j.giq.2018.09.010>
- Wolf, A., Fors, A., Ulin, K., Thorn, J., Swedberg, K., & Ekman, I. (2016). An eHealth diary and symptom-tracking tool combined with person-centered care for improving self-efficacy after a diagnosis of acute coronary syndrome: A substudy of a randomized controlled trial. *Journal of Medical Internet Research*, 18(2). <https://doi.org/10.2196/jmir.4890>
- Yoo, H. J., & Suh, E. E. (2021). Effects of a smartphone-based self-care health diary for heart transplant recipients: A mixed methods study. *Applied Nursing Research*, 58. <https://doi.org/10.1016/j.apnr.2021.151408>