# Project Proposal

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| **Student Number** | 2012430 | |
| **Course** | Research Methodologies and Emerging Technologies | |
| **Supervisor Name** | Mr. Vibhavi Artigala | |
| **Course Coordinator Name** | Dr. Enjie Liu | |
| **Title of Project** | Mobile application to improve mental health of persons with Dementia | |
| **Abstract of the project** | The proposed project is to develop a mobile application for people with Dementia and Alzheimer's. Dementia is recognized as one of the growing social health problems among older people in society. This is not a problem for the individual concerned, but it causes stress to the family members, neighbours, friends, and others who are involved in supporting a person with Dementia. Dementia is caused by abnormal brain changes, damage to or loss of never cells and their connection in the brain and communication problems, a change in personality, and a reduce ability to carry out daily activities such as washing or dressing. Depending on the area of the brain that is affected, they may face experiences in short term or long-term memory loss. It may lead to physical malfunctioning and disability too. Simply the drugs do not use for these people to improve their mental stability but if the patient is risk of harming themselves or others, they must seek medical attention to take drugs. Otherwise doctors recommending for music sessions and sound therapies. Since this is a modern era there is a strong relationship between human and information & communication technology. By using information technology, it can develop solution applications. This proposed project will help people with dementia maintain and improve mental functions. Since patients with Dementia have difficulties in concentrating, their span of attention is low, and they project irregular behaviours. Due to this reason, the caretakers find it difficult to handle them. Here the researcher can build their attention through calm sounds such as water flowing, the sound of birds, playing soothing music to calm them down, and have a conversation about that sound and what they heard. From the beginning by studying the patient’s behaviour and output, the researcher can get to know his or her likes, dislikes and interest to develop a successful application to improve their concentration and span of attention. For that, the researcher needs to provide activities to remember things, ask questions about their past and what they remember without giving any sort of pressure or stress to the patient. By using attractive colours to the user interface, we can draw the patient’s attention to the device. | |
| **Project deliverables** | **Software** – Mobile application  **Documentation** – Project proposal, Patient’s activity progress report, Reflective Report, Contextual Report, Thesis Report | |
| **Description of your artefact** | * “Sundowning & Agitation" research has shown Alzheimer's and Dementia patients frequently become disturbed late in the afternoon or early evenings. Geotechnologists have initiated the “Sundown” mobile application to calm down these patients. * Through one website there is a mobile application called “MOBI-COG” used 3 minutes for dementia screening test called “Mini-Cog test” which is administered by the caregivers. This test involves remembering and recall a set of words. The next step is to free the hand drawing test. So, all these tests are automated by the application and checking the correctness of the freehand drawing test to measure the accuracy. * “Busy-Boards” these are mobile applications that design to get attention from the patient to complete simple tasks. From this attempt to calm the person when they are experiencing a meltdown. So, after they are completing the task a reward is given to the user. This application can be unique to help maintain or improve cognitive memory. * Organizations such as “musicandmemory.org” promote ordinarily unresponsive Dementia patients to be enriched with life and talkative. * **Aim** * To improve mental health and quality of life a person with Dementia * **objectives of the project** * To Identify the patient’s attributes properly relating to Demetria which is suitable to the patient. * To implement a neural network which predict the range possibility of Dementia level. * Activity simple tasks to complete to get the attention of the patient. These tasks have levels * To develop a mobile application which provides * **Features**   + New user registration   + Adding simple tasks to recognize such as shapes, colours, and sizes   + Adding simple words to remembering and recall a set of words   + Playing soothing music to keep the patient calm down   + Additional sounds such as sounds of birds, sound of water flowing and other non-disturbing sounds * **Project Provides** * Provide patient to maintain a good mental stability using my mobile application * **Challenges**    + Some patients according to their mental status we cannot be able to handle the patient make to calm them down   + Sometimes it is difficult to give a mobile device to them. We need to keep watching after giving the device. Some patients have difficulty holding the phone. Maybe they cannot move their hands to do activities   + Sometimes we need to have the patience to deal with them. Because they are asking the same thing repeatedly. This may be very disturbing to us to complete the tasks   + The patient may face the difficulty of what they want to do using the device. Some patients do not aware of using touch mobile devices. We need to have the patience to teach them how to use it to complete our tasks.   **References:**   * Coppola PhD, J.F., Kowtko, M.A., Yamagata, C. and Joyce, S., 2013. Applying mobile application development to help dementia and Alzheimer patients. * Guo, Y., Yang, F., Hu, F., Li, W., Ruggiano, N. and Lee, H.Y., 2020. Existing Mobile Phone Apps for Self-Care Management of People With Alzheimer Disease and Related Dementias: Systematic Analysis. *JMIR aging*, *3*(1), p.e15290. * Leys, D., Hénon, H., Mackowiak-Cordoliani, M.A. and Pasquier, F., 2005. Poststroke dementia. *The Lancet Neurology*, *4*(11), pp.752-759. * Marceglia, S., Rigby, M., Alonso, A., Keeling, D., Kubitschke, L. and Pozzi, G., 2018. DEDICATE: Proposal for a conceptual framework to develop dementia-friendly integrated eCare support. *Biomedical engineering online*, *17*(1), p.121. * Nirjon, S., Emi, I.A., Mondol, M.A.S., Salekin, A. and Stankovic, J.A., 2014. MOBI-COG: a mobile application for instant screening of dementia using the mini-cog test. In *Proceedings of the Wireless Health 2014 on National Institutes of Health* (pp. 1-7). * 2020. [online] Available at: <https://www.youtube.com/watch?v=5FWn4JB2YLU> [Accessed 26 October 2020]. | |
| **What methodology (structured process) will you be following to realise your artefact?** | The researcher will be doing his study, so first the research collecting data from doctors and patients caretakers or relatives as well as the research will meet the users of the system and get the feedback and would analyse the data. The research will develop an application to help for the improvement of persons with dementia and then result will be recorded. once the results are recorded, the research crosscheck with the data which he has gathered and the system output and then conclude  The agile method is used as the software development methodology for the proposed project. Due to customer satisfaction developer must change the user interface from time to time and adding new features to the application. This is incrementally instead of all at once. Using agile allows delivering the project progress version wise. When a new feature comes it can be analysed, design, develop, testing, and deploy the working functionality.  After releasing every new feature that developed, those functionalities give to a random set of users to get feedback about the feature. | |
| **How does your project relate to your degree course and build upon the units/knowledge you have studied/acquired** | * Using the knowledge of research methodology launching the research project. * Using the knowledge of the Software development life cycle to design, develop, and test the quality of the product * Using the knowledge of Android to develop the mobile application * This research useful for my academy as well as this gives a good experience of handling a real-world research problem and to find a solution to that | |
| **Resources** | * Tools - Android Studio, Trello, Firebase, Sublime text * Languages – Android, Java, Python * Environment – Java JDK, Java JRE | |
| **Have you completed & submitted your ethics form?** | YES | NO |
| **If the project is a development of previous work by yourself or others, give details below. Failing to declare such previous work here may be treated as an academic offence** | | |

**Supervisor Signature:**

**Course Coordinator Signature:**

**List of relevant resources**

1. *Books*
   1. Coppola PhD, J.F., Kowtko, M.A., Yamagata, C. and Joyce, S., 2013. Applying mobile application development to help dementia and Alzheimer patients.
2. *Journal Papers*
   1. Guo, Y., Yang, F., Hu, F., Li, W., Ruggiano, N. and Lee, H.Y., 2020. Existing Mobile Phone Apps for Self-Care Management of People With Alzheimer Disease and Related Dementias: Systematic Analysis. *JMIR aging*, *3*(1), p.e15290.
   2. Marceglia, S., Rigby, M., Alonso, A., Keeling, D., Kubitschke, L. and Pozzi, G., 2018. DEDICATE: Proposal for a conceptual framework to develop dementia-friendly integrated eCare support. *Biomedical engineering online*, *17*(1), p.121.
   3. *Yousaf, K., Mehmood, Z., Saba, T., Rehman, A., Munshi, A.M., Alharbey, R. and Rashid, M., 2019. Mobile-health applications for the efficient delivery of health care facility to people with dementia (PwD) and support to their carers: a survey. BioMed research international, 2019.*
   4. *Yousaf, K., Mehmood, Z., Awan, I.A., Saba, T., Alharbey, R., Qadah, T. and Alrige, M.A., 2019. A comprehensive study of mobile-health based assistive technology for the healthcare of dementia and Alzheimer’s disease (AD). Health Care Management Science, pp.1-23.*
   5. *O'Connor, S., 2020. Co‐designing technology with people with dementia and their carers: Exploring user perspectives when co‐creating a mobile health application. International journal of older people nursing, 15(3), p.e12288.*
3. *Web Sites with relevant information*
   1. Nirjon, S., Emi, I.A., Mondol, M.A.S., Salekin, A. and Stankovic, J.A., 2014. MOBI-COG: a mobile application for instant screening of dementia using the mini-cog test. In *Proceedings of the Wireless Health 2014 on National Institutes of Health* (pp. 1-7).
   2. *2020. Build Your First App. [online] Available at: <https://developer.android.com/training/basics/firstapp> [Accessed 30 October 2020].*
   3. *Android Developers. 2020. Build Anything On Android. [online] Available at: <https://developer.android.com/> [Accessed 30 October 2020].*
   4. *Firebase. 2020. Firebase. [online] Available at: <https://firebase.google.com/> [Accessed 30 October 2020].*
4. *Relevant software*
   1. *2020. Android Studio. Google,JetBrains.…*
   2. *2020. Trello. New York City, U.S.: Atlassian.*
5. *Relevant hardware*
   1. *Personal computer*
   2. *Android mobile device*
6. *Human resources*
   1. *Interview with a doctor*
   2. *Interview with random dementia patients*