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Health Tracking Solution For Assisted Living Facilities With Wearable Technology

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Abstract - The norm In developed nations mainly united states and western Europe elderly members of the family are sent to assisted living facilities with 100s of beds where 4 elderly people are kept in one room and a doctor visits once a week for checkup otherwise there are qualified nurses or caregivers that take care of their needs.

The system uses manual and wearable technology. The system takes parameters like Blood pressure, Heart Rate, and other important sophisticated parameters and creates a consolidated report of the elderly to give it to doctors which can give a doctor more insight as to how they can take better care of these older people in relation to nutrition, diet, etc

The elderly who are enrolled in assisted living facilities are not physically sick, As people get old the body doesn't perform as well as compared to young adults, Introduction of wearable technology to this market gives more information to doctors which can lower the dosage or completely eliminate the need for medicine replaced by just nutrition based on the extensive data.

Keywords: Assisted Living Facilities, Wearable Technology, Elderly Care, Health & Fitness, Mobile application.

1. Introduction

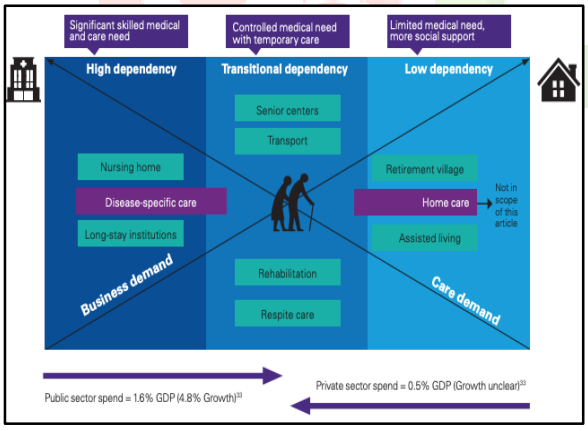
Assisted living facilities are primarily shared nurse service offering facilities to take care or elderly people to the households who intend special care for their elderly either due to financial deficiency or just availability of specialised services provided by higher end of assisted living facilities which could not be possible in home.

The norm in the developed nations is that after retirement elderly of the family live

in assisted living facilities, which facilitate consultation from doctors on weekly basis and the daily care of elderly is taken by qualified nurses and caregivers in the facility, At the weekly consultation by doctor, the doctor only gets about 5 minutes time to ascertain if the elderly is in good health or not which is not adequate time to ascertain the proper health of elderly because as the human body does not perform as it used to when in adult age thus there is enormous need of, If health is measured properly especially in older age it can lead better years in golden age.

2. Need and Motivation

In old age due to low to no income of elderly and other obligations of their children it is not financially viable to take care of elderly in home properly for majority of



population due to high cost of living

Fig 1. Cross Section Of Dependency Of Elderly Based On Lifecycle [4]

Natural inclination of doctors is to prescribe medication for even a small discomfort which results in other side effects on the body by the medicine and as people get old the body just doesn't perform as efficiently as it were performing in younger age so the side effects become debilitating, Cost of medicine in developed nations is very high which makes preventing it a smart financial decision in older age when income is low. Lower use of medicine will provoke a better and healthier lifestyle with support from proper nutrition. There is little or no technology introduced in assisted living facilities outside the sophisticated medical equipment.

3. Size Of The Industry & Market Potential

Worldwide 20% of GDP is Spent on Healthcare and roughly 80% to 85% is spent in the last 6 months of life. It is an indication that any product or service that targets an audience for this age profile always has potential to make money.

The 20% of GDP which is spent on healthcare most of it is spent in older demographics with innovation in the Pharmaceutical industry people are going to live longer thus making the future brighter for the Assisted living industry in mentioned countries,

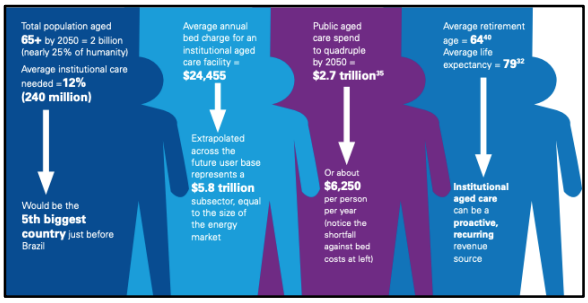


Fig 2. Scale Of Market Opportunity by KPMG [4]

The size of the market for assisted living facilities in this case a B to B transaction is roughly around 100,000 + Facilities in the United States, 30,000 + Facilities in the United Kingdom Similar in Rest of Europe As United Kingdom due to lower population as compared to United States. Total Pristine Market is Roughly 500,000 Facilities in 10 High Discretionary Income Countries.

4. Problem statement

The issue with the current way of operation with assisted living facilities is that there is very little or no introduction of technology, thus when a doctor visits a facility for weekly checkup of the elderly the doctor only relies on the feedback from the elderly to make a good decision and advice medicine or nutrition which does not give adequate time or information to make a good decision

The facility does not have a vast amount of data about the health of the elderly to give them personally catered services or take care of them which is more suitable as an individual. Lack of extensive knowledge of the health of elderly vis a vis medical tests leaves future open for guess work for doctor

The formal training of the doctor is to provide medication for even slightest pain or state of malaise which is not a problem in young adults but as our bodies get older the capacity to process the medicine decreases and the side effects of the medicine are detrimental which could be easily avoided if doctor had more knowledge as to what is the actual state of elderly is instead of just input of the elderly.

5. Solution

The facility has qualified nurses available in the premise to conduct tests and uploads the results of the conducted tests using android application to database and the application produces a consolidated report to show it to doctor, The facility conducts these tests each day of the week and doctor gets the report at the end of the week or anytime required along with what medication and nutrition is currently being given to the elderly

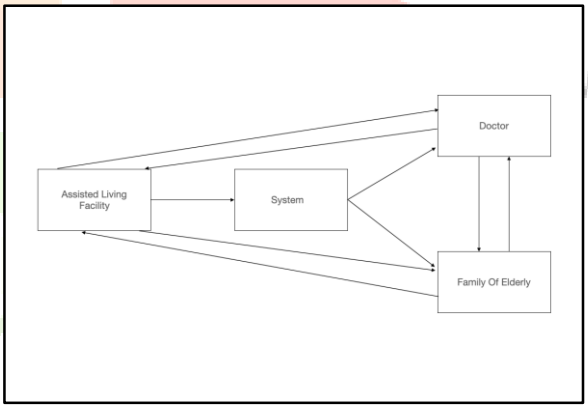


Fig 3. Illustration of The System Architecture

In future development these tests can be conducted with wearable devices like a constant glucose monitor which takes the glucose measurement constantly throughout the time in a day which is more suitable for more extensive health tracking when needed.

6. Benefits Of The System

The doctor having more data gives an advantageous edge to the decision making process of the doctor at this point doctor can rely on solid data which is measured instead of just feedback or input from elderly this ends up in lowering the amount of medicine based on the data or completely eliminating the medication or instead providing nutrition which could cure or prevent the state of malaise

Facility owners based on the collected data can provide services that are more suitable and needed to the elderly which could boost their health and provide better living.

Family members of the elderly can track the comments of the facility and see what necessary actions need to be taken in order to keep them healthy and happy

The collected data is valuable as gold, with the help of this data machine learning algorithms can be utilised to predict and suggest type and amounts of nutrition and therapeutics which could be of extreme value to the good health of elderly, along the line of health tracking this collected data can also suggest when and at what time of the day the food intake by the elderly should take place and same with medicine and nutrition based on the past performance of the physiological of the elderly from the collected data

7. Outputs Of The Application

1.The consolidated report contains the results of the tests on the left in yellow cards which are scrollable and each card represents the tests conducted on daily basis, on the right hand side the green cards show that what nutrition is being given to the elderly and in what amount, down below the green cards the red cards show that what medication is being given to the elderly and in what amount

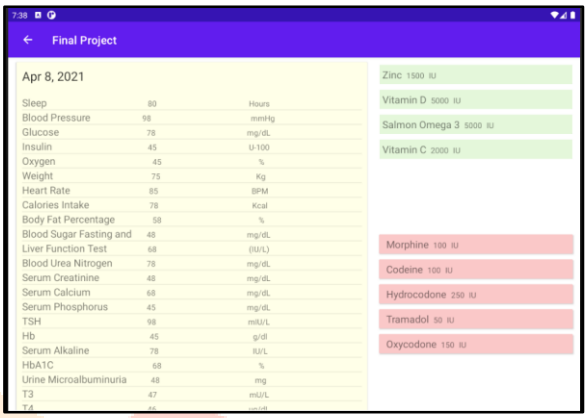


Fig 4. Consolidated Report produced by the system

2. The database of the application which is demonstrating the storage structure of the application each of the document can contain 1MB worth of text data which is more than adequate and the data in the database is updated in real time as the facility enters the new information

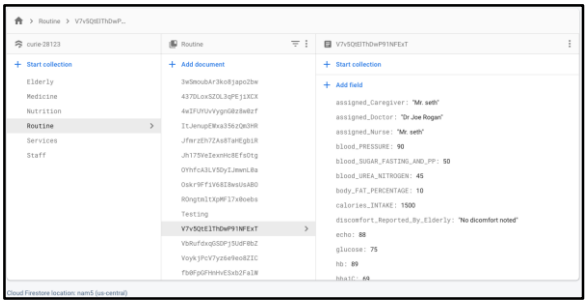


Fig 5. Data Storage Structure Of The Application

8. Conclusion

Reduction of medicine consumption or complete elimination is very possible with the use of wearable technology and assistance of healthcare professionals. Which is extremely valuable in older age when the human body can't process the medicine properly. With a large amount of data collection gives an opportunity to doctors to make better decisions as to how well we can take better care of elderly.

References

1. Bang-Wen Jeang and Yihui Xu, Intelligent Elderly-Care in the Era of Internet and Big Data
2. Vácha, V. Kandusová , Making Innovation in Elderly Care Possible Using Participatory Design
3. Hissam Tawfik, Obinna Anya, Towards Lifestyle-Oriented and Personalised e-Services for Elderly Care
4. Kais Lakhdar, Ph.D, Georgina Black, Blurring The Lines
5. Stuart Craig, Matthew Grennan, Joseph Martinez, and Ashley Swanson, Using Machine Learning Methods to Predict Physician-Hospital Integration
6. Matthew Grennan and Robert J. Town, Regulating Innovation with Uncertain Quality
7. Bussolo, Maurizio Koettl, Johannes, Sinnott, Emily, Golden Aging.
8. Amit Bajaj, This tiny nation is showing the world how technology can make a huge difference to the elderly
9. Pang Sze-Yunn, This tiny nation is showing the world how technology can make a huge difference to the elderly

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