Complex Engineering Problem Addressing

A project about Virtual Doctor and Human Health related system

Motivation: We live in a modern and educated country. But Each year people are dying without the basic first aid treatment. Also, In Village area the number of proper doctors is still limited. So, the basic treatment and Information is still missing. Using technology and internet this system can decrease the number of deaths. Also help everyone, who is seeking heath related information's.

Fig 01: A news about health professional shortage in Bangladesh during pandemic time.

Source: https://cutt.ly/xlXBYuU / Bangla Tribune - 18 November 2020

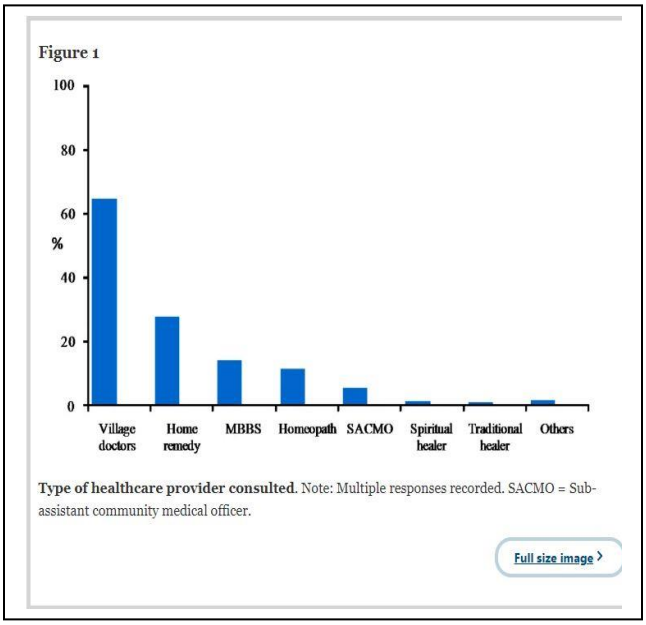

Fig 02: A research paper about the village doctor and their poor services.

Source: https://cutt.ly/TlXN34u / BMC International Health and Human Rights – 06 July 2010

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Objective: The objective of the project is to use a real time data-based AI technology to solve the problem.

Critical Challenges: Working with hospitals stuffs, medicine company and doctors will a critical challenge.

Conflicting Requirements: Without seeing the patient, prescribe a prescription will be a risk for doctors. Or they may think like that. Maybe they will hesitate to work. So, Doctors will a critical Challenge.

Some components of Complex Engineering Problem:

Knowledge Profile (K)
K1 – Natural Science
K2 – Mathematics
K3 – Engineering Fundamentals
K4 – Specialist Knowledge
K5 – Engineering Design
K6 – Engineering Practice
K7 – Comprehension
K8 – Research Literature

Attribute	**P1 and Some or all P2 to P7:**
Depth of Knowledge required	**P1:** one or more of K3, K4, K5, K6 or K8
Range of Conflicting requirement	**P2**: wide-ranging or conflicting technical, engineering and other issues
Depth of Analysis requirement	**P3:** no obvious solution
Familiarity of Issues	**P4:** Involve infrequently encountered issues
Extent of applicable codes	**P5:** outside problems encompassed by standards and codes of practice
Extent of stack-holder involvement and conflicting requirements	**P6:** diverse groups of stakeholders with widely varying needs
Interdependence	**P7:** many component parts or sub-problems

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Let's explore how a few P's could be addressed through this project:

P1: Developing for an App for this project (**K6** – Engineering Practice), This project generally requires a study of similar work with the same purpose as ours. (**K8** – Research Literature), We must need some medical knowledge and hospital and doctor things (**K4** – Specialist Knowledge), Design the program (**K3** – Engineering Fundamentals), Study about data and find a solution for a specific problem (K2 – Mathematics)

P2: Data Analysis with proper regularization while limited real data is available will be create a Conflict for this project.

P6: Various group of stakeholders also the hospital and medicine stores can be benefited by this project.

P7: This project involves four subsystems mainly:

- Data Collection
- Data Analysis
- Application Model
- Machine Learning

List of activities (As):

Attribute	**Some or all of the following:**
Range of resources	**A1:** use of diverse resources (include people, money, equipment, materials, information and technologies.)
Level of interaction	**A2:** resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues.
Innovation	**A3:** creative use of engineering principles and research-based knowledge in novel ways.
Consequences for society and the environment	**A4:** consequences in a range of contexts, characterized by difficulty of prediction and mitigation.
Familiarity	**A5:** Can extend beyond previous experiences by applying principles-based approaches.

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Let's explore how a few A's could be addressed through this project:

Attribute	**Some or all of the following:**
Range of resources	**A1:** This plan will require the collaboration of a variety of resources, including people (survey), money (project creation consideration), information, and technology.
Level of interaction	**A2:** A good level of interaction is important with the hospital's stuffs, doctors and pharmacists. Also, the pharmacy departments faculty members.
Consequences for society and the environment	**A4:** Using this system people will learn more about first aid treatment. That's why the rate of death will decrease. And this will be the consequence of the project for the society.