Problem Statements for BOLT Hackathon

Problem Statements from Capgemini

Medical and Health Care

CAPM1: Diagnosis – Natural language processing can help doctor to find out relevant portion or focus area from a lengthy report. Image processing can detect problematic areas more accurately.

CAPM2: Health care – Health care devices attached with body can generate steaming data, which can be collected by IOT and analyze for predicting diseases for taking precautionary measures.

Agriculture

CAPA3: Weather forecasting – Farmer can increase yields by know weather forecast.

CAPA4: Monitoring Soil health and condoling paste and weeds – Using computer vision and image analysis farmer can optimize pesticide usage by identifying paste affected crops and weeds.

Security and Surveillance

CAPS5: Face detection and recognition - identifying faces from a photo in a mobile app or identity card and restrict entry

CAPS6: Remote monitoring - Remote assets need monitoring in order to confirm that they are functioning as expected and to minimize sudden breakdowns and downtime. Video analytics can identify if assets are not optimally utilized or need maintenance without requiring the operators to check them in-person at regular intervals.

Education

CAPE7: Video indexer - Video indexer enables to extract insights from videos. It can create audio transcriptions, translate audio to other languages, generate search metadata from videos, and much more

CAPE8: Content Moderator helps to identify potentially offensive, unwanted content, bad reviews, negative comments and feedbacks of the users or customers towards a particular product or services from various online platforms like Social media or other social web pages while studying online.

CAPE9: Immersive Reader - Reader are engaged through multi-sensory, multilingual learning that includes reading aloud, translating into different languages, highlighting specific lines of text, and visualizing word meanings through illustrations.

CAPE10: Crate Personalizer – Identifying specific interests based on click stream and provide or recommend personalized study materials.

General Problem Statements

Theme: Agriculture

AGR1: Portal for Farmers to sell the produce at a better rate

AGR2: Crop Guidance and Farmers Friend • Problem Title : Helping the farmers in terms of Crop suggestion, precautions based on the met department forecast of rain fall / weather, potential pest attacks , weather warnings etc.

AGR3: Auto Climate Monitoring System

AGR4: Assessment of land holding pattern, source of irrigation, cropping pattern and depth of the wells in different parts of the country

AGR5: Low cost and affordable Smart Autonomous Remote Monitored Agri-Horticulture systems

AGR6: Solar Powered Smart Irrigation System

AGR7: Way out for man-animal conflict, especially for protection of agriculture crops from wild animals

AGR8: Lack of technological intervention in value addition of agriculture products produced by SHGs /FPGs

AGR9: IT Solutions for precision based irrigation, fertigation, crop growth, crop maturity in Horticulture

AGR10: Software for computerization of farmer, land details along with beneficiary schemes details

AGR11: Livestock Ownership Database

AGR12: Estimation of crop progression

AGR13: Estimation of crop yield using modern ICT tools which is quick and reliable for making a realistic plan for procurement and to compensate farmers for yield loss if any.

AGR14: Developing a real time produce life time monitoring & sharing mechanism to enhance output realization to farmers through private sector participation and DBT

AGR15: Develop a real time land usage monitoring tool using satellite data and artificial intelligence etc

AGR16: Extraction of crop cycle parameters from multi-temporal data

AGR17: Enabling transparent price discovery and forecasting of crop arrival along with management and utilization of price stabilization funds in the case of agri - commodities

AGR18: Quick analysis of quality of cereals, oilseeds and pulses using AI

AGR19: Mobile App for sharing or pooling of transport for agricultural produce to market

AGR20: Due to season unbalance, different soil type, irrigation problem and critical diseases; PEANUT production decreasing so there should be solution for this to maintain production and make use other part of peanut plant to give more benefits to Farmers.

AGR21: It is difficult to set the distance between two seeds. Not possible perfect sowing by mechanism system. In seed drill machine behind big wheel so industries main problem is its trasportaion. Many time this wheel main problem is bending. When start sowing

AGR22: Now a day's agriculture land is not enough as per our locality and some aggregates are not grow in India so we have to import from other countries.

AGR23: Technology to enable seamless marketing of agri commodities beyond the current geographic clusters

AGR24: Translate weather information to very actionable advisory to farmers

AGR25: Real time identification of crops, weeds, diseases and pest damage and nutrient deficiency symptoms

AGR26: Development of a multilingual Mobile App for deep sea fishermen

AGR27: Marketing network for agricultural commodities for the benefit of producer and consumer

AGR28: Forewarning system for disease/pest attack for different commodities in different agro-climatic zones.

Theme: Education

EDU1: Education videos are lengthy and time taking. Propose a method to save students' time by shortening the videos in such a way that, students only see what's very important.

EDU2: Design a system to improve E-Learning for visually impaired students.

EDU3: Design a platform for students to log all their daily study related activities in such a way that maximises their efficiency.

EDU4: Create a system to improve Screen-Sharing(like skype or anything similar) based learning and make it more interactive.

EDU5: Create a system to use AR/VR to improve learning in classrooms.

EDU6: Digital solution for effective learning of persons with specific learning disabilities

EDU7: At present there is no platform to connect students & staff all over India. A platform/portal where students could put up their projects, share their problems, contribute to projects, help in academics, suggest new ideas, just come together

for any possible work. This will help them for all over development, inform them about current advances in curriculum's, etc.

EDU8: You know you always wanted to ask some question in the lecture but you were shy or were afraid because you thought the question might be stupid or your friends might laugh at you. Could we get rid of this problem as well?

EDU9: Every new Project or just a Project Idea or just a solution to a simple math's question should get some points or some form of credits (Like upvotes in Quora). In this way we could gamify everything & make it real interesting.

EDU10: Develop a course tracker that tracks a lecture series for a course. The teacher puts in lecture notes and references at the end of every lecture and the system trawls the internet for resources that supplement the lecture topic such as open source projects, book references and academic and/or professional papers.

EDU11: Develop a recommendation system for the users of library. The users should get personalized recommendations based on the information of previous readings. Information like reading patterns, authors, reading style, and book read status, rating, similar interest/topics, etc. can be used as input to give recommendations.

EDU12: Mobile location based student attendance

Theme: Health Care

HEL1: Insurance companies regularly gets health check reports submitted by potential buyers of insurance. You need to find a way to digitize different kinds of printed lab reports to discrete values of each parameter captured. Conversion to a standardized set of digitized value will help in automating lot of backend approval process. Ability to read and classify comments for common parameters will be a big plus When a customer is uploading his health check report regularly, then also a trend chart can be plotted for key parameters. Few sample reports will be provided to the participating teams. Test will be based on that as well as unknown set of health check reports post completion.

HEL2: Due to the pollution on the rise, food habits and hectic schedules we are getting more and more prone to health-related issues for which many a times we

use antibiotics drugs. Antibiotic resistance on the rise—and predicted to kill 10 million people per year by 2050. Do think of this problem in India context, lack of knowledge, how antibiotics are prescribed, how to gather the usage of antibiotics across the country and how to mitigate the challenge. Idea would be to see what all are the most common antibiotics / salt in those drugs are being used, for what all diseases they are being prescribed for and predict what are the probable antibiotic drugs (salts) which would become non-effective after a certain time for curing a specific microbial infection or disease. Requirement is to build an antimicrobial stewardship platform, which should be able to provide this solution.

HEL3: The animal health database shall contribute to increased public awareness regarding the occurrence of diseases, so that further recurrence could be curtailed. The case sheet database should be accessible to all the professionals and serve as a knowledge base for them. The Medicines Requirements to treat different ailing animals and their availability in the nearby market when digitized serve as guide to the manufacturers about the types of diseases prevalent and the kind of medicines in use, so that manufacturers might be able to tune up their production levels to meet the market demands. Problem Data set can be: Current veterinary drug indexes will help

HEL4: There is an acute shortage of health care in smaller towns and villages. The objective is to scale up of the existing telemedicine /call center for doctors' network to all sub centers using DTH or similar technology that allows two-way communication and is not dependent on Internet Service Providers. All data to be held in a cloud server, Integrating cloud tech with Patient MIS and Aadhar authentication, in order to make it easy for patients belonging to low socio economic and educational backgrounds for safe keeping of medical records and also for accessing the databases by emergency medical technicians by merely using biometric / thumb impressions.

HEL5: There exists good medical facilities across city in India. But due to higher migration rate and other factors, some people are not aware of these facilities. Moreover, eligible people are unaware of government schemes for availing medicle facilities. We are seeking software solution for (1) checking availability of nearby medical facilities, based on search criteria (2) facility for checking related

medical government schemes, as applicable. Additional features are also welcomed

HEL6: Chat bots in health care may have the potential to provide patients with access to immediate medical information. Health care chat bots could help patients better manage their own health, improve access and timeliness to care. We require: Use of AI based Chat bots for providing health related information

HEL7: Design an app to write formatted prescriptions based on dictation from doctor. Refer attachment for more detail. The app should provide facility to sign the prescription and also send to the patient directly on his phone and email id. The method of storing the medical records (EHR) should follow relevant compliance

HEL8: Develop a technology-based solution for Kids, Senior citizens, especially abled individual on any one who need supervision which can alarm the concerned person in case person who need supervision is crossing a specified boundary for eg 10 meters outside a specified boundary. You should also think about more innovative ideas to see what more value you can bring to these individuals for eg : devices which can apart from keep tracking an individual can also collect heath parameters such as heart rate and alert concerned person in case of any issue. This health data can be further used for research and development of these individuals.

HEL9: IOT based patient health monitoring system

If a person is critically unstable and needs to be taken to a hospital through an ambulance. While travelling through ambulance the major problem is doctor is unable to attend them at once. So develop an app, which will make the doctors and hospital staff to monitor the condition of the patient in the ambulance.

HEL10: During recent years, due to the technological advancements many sophisticated techniques has been evolved for assuring fast recovery of the patients in hospitals. Need for good patient care in hospitals, assessment and management of fluid and electrolyte is the most fundamental thing required. All most in all hospital, an assist/nurse is responsible for monitoring the electrolytes bottle level. But unfortunately most of the time, the observer may forget to change the bottle at correct time due to their busy schedule

Theme: Cyber Security

CYB1: Key loggers over the years have also become sophisticated, making it hard to AVs to detect them. And as a project you, you can do research on different ways to spot and delete a key logger from a system. You can also include how one can manually search a key logger by digging into the system to end the keylogging process

CYB2: If you don't know what Caesar cipher is, it is a type of encryption method that was first used by Julius Caesar to communicate with his officials. This encryption technique is also considered to be one of the first methods which are still effective.

CYB3: As a project, using the logic behind this cipher, you can build a small web app that can break Caesar cipher. This would be a great project as a beginner. As someone who is just getting started with cybersecurity, this kind of project would give you the confidence to take up projects that are more advanced than this

CYB4: Packet sniffing is one of the most important concepts of cybersecurity. When you are in the get-go of your cybersecurity journey and want to do a project around the concepts you learnt, packet sniffing could be a great choice.

CYB5: If you are learning cybersecurity in a training centre, then they would definitely allow you to perform this task for your project. But if you are using a network of an organisation or an institute then it is advised to take prior permission from the administrator. Packet Sniffing, which is also known as network traffic analysis is all about taking a look at data packets that are sent across the internet and moves on your network. Once done analysing, you can submit a report.

CYB6: SQL Injection is one of the most initial and important topics in cybersecurity. Over the years many websites have been hacked using SQL injection. It is a type of injection attack that makes it possible for hackers to execute malicious SQL statements. Therefore, a project on this concept would add significant value to your portfolio.

CYB7: However, completing this project is not easy because you can just randomly pick any website and start testing. You have to inform and take prior permission from the website admin. While most of the website owners will not

agree to let you perform a vulnerability assessment, you can always reach out to small blog owners. If that doesn't work as well, you can get a web page developed and perform the test on that.

CYB8: Bug bounties is another good way to gain relevant experience. There are several bug bounty programs available on the internet; you can take part in different programs and try your best to find the bugs. Based on your approach towards the task and tools you have used, you can prepare a report. Also, upon successful completion of the task by finding a bug, you get paid.

CYB9: Cyber Security Breaches in current government bodies and corporate environment. We can eradicate this problem through continuous security monitoring using AI and ML. We are going to enter into cyber security market which is around 190 billion dollars market where we will not require human efforts to monitor all resources which are based on Internet.

CYB10: We need to develop a mobile app with website that will enable users overlay 3D images of Glasses (spectacles) on its users faces when they try the app. Swiping form left to right or right to left the users can change the filter (3D image), enabling the user choose the best lenses for him or her.

- Functional Requirements of Solution
- Payment options support
- Wish List Button
- Feedback system
- Ability to overlay 3D image on a user face.
- Orders management
- Product management

CYB11: Printer Watermark Obfuscation--Most color laser printers manufactured and sold today add "invisible" information to make it easier to determine information about where and cu when a particular document was printed. Some manufacturers have acknowledged the existence of the tracking information in their documentation while others have not. None of them has explained exactly how it works or the master scope of the type of information that is conveyed. There are no laws or regulations that require printer companies to track printer

users this way, and none preventing them from ceasing this practice or providing customers a solution to avoid being tracked.

CYB12: JPEG Image Steganalysis Using Variation Technique--Recent increases in security breaches and compromises of sensitive information have resulted in an increased need to target, identify, and prevent these breaches. Steganography is one method used by criminals to covertly pass hidden information without drawing suspicion. Steganalysis is a methodology to detect and sometimes extract the hidden information. JPEG Steganography, stegananlysis and the variation technique specifically are explored in detail in this presentation.

CYB13: Many websites ask you to answer "security questions," like "What is your mother's maiden name?," to recover your account if you ever forget your password or login ID. However, sometimes the answers to those questions are easy to find online. Does this pose a risk to the security of important accounts like email and online banking? Are people even aware that this information about them is available online? In this project, you will investigate how secure people think security questions are, and compare that to the reality of how easily you can find answers to these questions online.

CYB14: Keeping It Private: Blocking RFID Readers from Reading your ID Card

CYB15: If you've ever watched an adult pay for something by simply touching their credit card to a machine at a store, or you've done the same with a bus pass, you've seen an RFID tag in action. An RFID (Radio-Frequency IDentification) tag allows a card to be read by a computer from a short distance away. This is very convenient, but it also allows criminals to steal information about you. For instance, on the subway or the bus, someone standing next to you can use an RFID reader to access the data on that card. After learning what materials can be used to block an RFID reader, you can design a solution to protect your cards and your passport.

CYB16: Password Security: How Easily Can Your Password Be Hacked?

CYB17: We use passwords every day for our email and other computer accounts. How secure is the password that you use? How hard would it be for someone to guess your password? How hard is it to write a computer program to guess a password? You can see for yourself by writing a simple password guesser in the

computer language Python. We will get you started with some ideas, a little sample code, and a few passwords for your computer program to try and guess.

CYB18: Identify Solution with respect to Interstate & Inter Country Criminals

CYB19: Inegrating identification of HS Codes and LCS checking at the International borders and improving the surveillance system

CYB20: Identification of suspects based on their gestures, gait, BMI (Body Mass Index) and motions or objectionable/ illegal/ improper behavior and gesture of the police (Datasets will be provided on request)

CYB21: Identification of optimal set of multiple interceptor launch areas to maximize the destruction of multiple air targets

Theme: Wireless and Sensor Systems

ESS1: Develop a solution for Water leakage so that its identification is done and automatic actions are taken

ESS2: Design and develop Smart Parking System based on night vision camera

ESS3: The challenge is Smart Prediction System for Air and Water Pollution

ESS4: Develop a Smart domestic electric energy management system

ESS5: Automatic illegal solid waste dumping alert system

ESS6: Safe Distance Alarming System in Vehicles so that accidents can be avoided. Objective of this theme is to make the automobiles with more interactive and intelligent for avoiding accidents on roads. In order to prevent from accidents, different sensors are used to observe fatigue levels of driver, pulse rate, alcohol level, obstacle detection and also sudden collisions.

ESS7: Today in the current global scenario, the prime question in every girl's mind, considering the ever rising increase of issues on women harassment in recent past is mostly about her safety and security. The aim of this theme is to develop a device which is the integration of multiple devices, hardware comprises of a wearable "Gadget" which continuously monitor the scenarios around the girl and stream the data whenever there is a need.

ESS8: The aim of this problem statement is to develop a IoT based system for Smart Agriculture. The system should assist the farmers in getting Live Data (Temperature, Soil Moisture etc.,) for efficient environment monitoring which will enable them to do smart farming and increase their overall yield and quality of products.

ESS9: This is an age-old problem for the life of people living in and around forest areas. In the last two decades there is an increase in human-wildlife conflicts. This is due to increase in human population, decrease in forest cover and in some cases increase in wild animal population as well. Till date there is no mechanism available to evaluate the human-wildlife conflict issues in the state and national levels. Also, to mitigate the issue, no technological solutions are available. Development of sensor-based technology to mitigate human-elephant conflict issue could be one of the suggested problems.