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Problem Statements Received

1. Chandigarh International Airport

Case Description	What is expected	Suggested Technology
<p>The most challenging area in the passenger handling industry is the toilets and aviation industry is also facing day to day problems to tackle many related situations.</p> <p>The objective is to develop an intelligent system which is able to sense smell, foul odour and degrading air quality in the washrooms, which should then raise an alert to the authorities, so that immediate action may be taken.</p> <p>The system should be integrated with a passenger feedback system, so that the related facilities, as per the suggestions collected, can be improved.</p>	<p>To develop an efficient compact system which should sense any type of real time foul odour in the toilets and immediately raise an alert for that particular toilet.</p> <p>The system should be robust to work continuously for 24 hours, with almost negligible failure and down time.</p>	<p>Artificial intelligence integrated with compact smart machine using nano-technology. The whole system may be built keeping in mind to offer a kiosk type of panel to take feedback from the passengers using the toilets.</p>

2. VityMobi Systems LLP

Theme - AI/ML

Case Description	What is expected	Suggested Technology
<p>Company X provides livechat support to its clients, whenever a visitor visits their client’s website. the visitor has the option to take help of a virtual assistant through live chat.</p> <p>The virtual assistant is a human being (called operator). Whenever the visitor asks a question the operator looks up into a pre-existing “knowledge base” to find if it contains the answer to visitor’s question. Normally the questions are quite thematic — for example asking for contact information, working hours query or some grievance readdressal.</p> <p>The lookup performed by the operator is a manual process and takes some time, during that Period the visitor is waiting for the operator to give a response.</p> <p>The requirement is to make the knowledge bank dynamic. To illustrate this — the most frequently asked questions by visitors should automatically come up to the top of the knowledge bank, this will save the “lookup” time of operator. This indexing is to be refreshed every 12 hours based on the chat transcripts recorded in the preceding period.</p>	<p>A software module preferably written in Python (or) NodeJS, that analysis the transcripts. Creates a “visitor question matrix” based on the analysis and prepares a list of “top 5” most frequently asked questions and their responses. This matrix needs to be refreshed every 12 hours.</p>	<p>There is no constraint. The only limiting use case is that the transcript data exists inside a MySQL database. The solution must be capable of interfacing with MySQL.</p> <p>Note — We will provide the transcript data for processing.</p>

3. VityMobi Systems LLP

Theme - AI/ML

Case Description	What is expected	Suggested Technology
<p>Company X is interested in knowing its “public perception index”. This includes the sentimental analysis of the company’s name across digital media, social media etc.</p> <p>The goal is to come up with a weighted score which will reflect if the company’s public perception is positive or negative. There will be two component to the weighted score — social media perception and electronic media perception (Newspapers, magazine articles etc).</p>	<p>The system should crawl the internet and publicly indexable social media feeds (wherever possible) and compile weighted scores based on the fact whether the public perception of the company is good/ bad/ neutral. The output will be number on a scale of 1 to 10; 1 indicated a very bad public perception and 10 indicating a very good public perception.</p>	<p><i>Up to the development team.</i></p>

4. VityMobi Systems LLP

Theme - AI/ML

Case Description	What is expected	Suggested Technology
<p>At the end of the trading day NSE publish daily stock trading data on its website (in CSV format). The goal is to parse this data over a month and find out the companies whose stock meets the following two criteria:</p> <p>(A) The total trading volume for the day is higher/lower than the one week moving average by x %.</p> <p>(B) The closing price of the day is higher/lower than the one week/month/quarter moving average by x %.</p> <p>*x is configurable</p>	<p>The software will be provided a path to the CSV file along with the filter parameters:</p> <p>The time period for which the moving average needs to be compared with closing price/quantity</p> <p>The cutoff x% definition for the outliers.</p> <p>The CSV data needs to be parsed and stored in a SQL/n-SQL data store.</p> <p>The outcome of the parameters defined will be displayed via UI and stored separately in a data store from where it can be retrieved in the future.</p>	<p><i>Up to the development team.</i></p>

5. Department of Water Supply and Sanitation Govt of Punjab

Case Description	What is expected	Suggested Technology
<p>Develop AI solution to check the project completion status of toilets being constructed under the Swachh Bharat Abhiyaan. Currently, project managers take photographs of the site and upload to indicate work completion. The AI solution should be able to evaluate the photographs and determine if work has truly completed. AI solution should also be able to perform duplicate photograph check. Should be able to monitor all the above through a mobile app.</p>		

6. Department of Water Supply and Sanitation Govt of Punjab

Case Description	What is expected	Suggested Technology
<p>Develop AI solution to monitor the site construction status of Water Works. Dept of Water Supply and Sanitation undertakes construction of water works sites. Photographic evidence is uploaded by site construction managers to indicate work completion. AI solution should evaluate the photographs and determine if work has truly completed. AI solution should also be able to perform duplicate photograph check (i.e. same picture uploaded from multiple construction sites should be flagged as duplicate). Should be able to monitor all the above through a mobile app.</p>		

7. Department of Water Supply and Sanitation Govt of Punjab

Case Description	What is expected	Suggested Technology
<p>Develop a hardware and software solution that monitors automatic pumps that control water supply. Info to be available on a mobile app. IoT based devices to be deployed to pull data and monitor live data feed of:</p> <ol style="list-style-type: none">1) No. of hours water supplied to a locality2) No. of hours chlorine (ppm) pumped into water (basically need to monitor chlorination)3) No. of hours water consumed by a locality		

8. Department of Water Supply and Sanitation

Case Description	What is expected	Suggested Technology
<p>Automatic Chlorinators should be designed that dispense chlorine automatically into water supply. Develop a IoT based solution that can monitor the whether chlorination is happening or not. Additionally, the IoT solution to also gauge whether Chlorinator has been refilled or is empty. Early warning signs and reminders need to be incorporated in the solution. Govt. officials should be able to monitor all of this through a mobile app.</p>		

9. Infosys - Facial Recognition

AI-ML

Use Case Description	What is expected	Suggested technology
<p>With a burgeoning population and a challenging crime rate, Indian Law enforcement agencies want to leverage technology to help solve some typical issues like identify criminals on the run, find missing children and victims of human trafficking or keep an eye on person of interest. It can also be used in the endeavor of Chandigarh Administration to make the city “Beggar free”. As long as missing individuals are added to a database, law enforcement can become alerted as soon as they are recognized by face recognition—be it an airport, retail store or other public space</p> <p>The objective is to build a predictive model used to recognize the appearance of a certain person.</p>	<p>Create a predictive model that can match individual photograph from within already existing photograph set. To recognize the appearance of a certain person, the ML algorithm needs to have specialized labeled sample set and should compare a person’s facial feature points against those stored in database.</p> <p>The solution should include camera locations, and integration with other Government functions where this is likely to be used (e.g. police stations, NIC, etc)</p> <p>Anomaly Detection for Generalized Face Anti-Spoofing would be a good-to-have feature.</p>	<p>Please Use Open Source to build Solutions</p> <p>Use of programming language such as python or R</p> <p>Machine learning library such as Scikit-learn or Tensorflow</p> <p>Object detection library such as OpenCV</p> <p>Object detection algorithms such as Convolutional Neural Networks</p> <p>Training Data can be fetched from http://www.scface.org/</p>

10. Infosys - Predictive Individual Health

AI-ML/Mobility

Use Case Description	What is expected	Suggested technology
<p>Health is prime concern for the Urban Society. We need to create a “Doctor app” which stores Individual personal lifestyle & medical data to predict future diseases the individual is likely to get. The stored info can assist the Doctor App to understand the Individual, his lifestyle and health risks. It should then provide dietary suggestions, things to avoid, exercise hours and so on to help the individual lead a healthy life.</p> <p>Add-on: The app should not only predict the physical health but also recommend corrective action to take care of the individual mental health.</p>	<p>Create a predictive model that can store individual’s medical history, have room for personalized inputs. Model should be re-trained on a frequent basis, and provide deemed suggestions to the individual using the Doctor App.</p> <p>Key features include:</p> <ul style="list-style-type: none"> ● Input medical history ● Input personalized changes ● Suggest key health risks ● Make dietary recommendations ● Make physical fitness recommendations ● Provide daily / weekly/ monthly data of key medical parameters of individual. <p>Health data is sensitive information hence a robust solution for protecting data privacy should be included.</p>	<p>Please Use Open Source to build Solutions</p> <p>Use of programming language such as java, python or R</p> <p>Services using Node.js or another server technology</p> <p>Responsible app design based app using any js tech</p> <p>Authorization using OAuth 2.0</p> <p>Machine learning software libraries such as Scikit-learn or Tensorflow.</p>

11. Infosys - Pharmacy supplies

Use Case Description	What is expected	Suggested technology components
<p>Pharmacy plays a vital role in a hospital to provide uninterrupted patient care services. The inventory of a pharmacy contains hundreds of drugs, their combinations, dosage forms and doses. A stock out situation of vital drugs in a hospital could have disastrous consequences.</p> <p>Aside from vital drugs, note has to be taken on medicines expiry dates, lead time to procure medicines, current usage patterns and so on.</p> <p>The objective is to create a smart procurement cum inventory management system for pharmacies.</p>	<p>Key features of the solution:</p> <ul style="list-style-type: none"> ● Provides real time inventory position of all drugs ● Detects unusual (increased or decreased) consumption of drugs ● Determines, detects and notifies threshold levels for drugs so that orders can be placed. ● Detects delays in receiving supplies from the vendor ● Notifies near expiry drugs ● Ensures FIFO (First in, First Out) or based on Drugs expiry ● Financial management of drugs ● Predicts future demand patterns using historical data 	<p>Please Use Open Source to build Solutions</p> <p>Use of programming language such as java or dot net</p> <p>Services using Node.js or another server technology</p> <p>Interactive dashboards using ELK or any other visualization tool stack</p> <p>Responsible app design based app using any js tech</p> <p>Machine learning software libraries such as Scikit-learn or Tensorflow</p> <p>Training Data can be fetched from https://www.kaggle.com/c/rosmann-store-sales</p>

12. Infosys - AI Chatbot

Use Case Description	What is expected	Suggested technology
<p>Hundreds of people call as well as visit to PGI reception every day to get various information. Keeping in view the huge load on phone lines as well as at reception counters, the wait time is quite high. Some people visit PGI website for information, however, it is not an easy task to search/find the required information on PGI website.</p> <p>Create a Bot to provide an Online Enquiry System for Hospitals. Solution has to be created with Chandigarh PGI in Mind.</p>	<p>Create an AI chatbot based IVR system as well as AI chatbot for existing PGI website.</p> <p>Key details should be picked from PGI Website to provide an automated response system.</p> <p>Typical features to address include:</p> <ul style="list-style-type: none"> ● Doctor’s schedule, ● OPD days, ● registration and fee counter locations, diagnostics, ● Consultation fees, Diagnostics fees etc. ● Contact numbers, ● Ward locations etc. ● The objective is to make it easier for public to get this information with minimal human interface. 	<p>Open Source Chatbot platforms such as RASA or Dialogflow</p> <p>Front-end design using Angular, React or similar framework</p> <p>Integration with popular social media platforms such as Twitter & Facebook using Twilio APIs</p> <p>Integration with communication channels such as Slack</p>

13. Infosys - Traffic Prediction

AI-ML

Use Case Description	What is expected	Suggested technology
<p>Traffic congestion has become a major problem which is characterized by slower speeds of vehicles, longer trip times and increased vehicle queuing, over and above the impact on environment. This lead to non-productive hours on road resulting in late arrival for work, impact on education and loss of business.</p> <p>The objective is to build a predictive model that can give insights on the behavior of traffic over long-term. These insights would be helpful in identifying regions in a network or city where future infrastructures such as flyovers or new roadways can be constructed without affecting the traffic congestion further. This use case also aims to detect any anomaly in traffic behavior patterns due to any atypical conditions such as vacations or festive seasons based on which future event planning can take place.</p>	<p>Create a predictive model that can predict the state of traffic next week/month/next decade (short / long term) for a particular region.</p> <p>Key features include</p> <ul style="list-style-type: none"> ● Map based traffic insights ● Historical data based busy / smooth traffic demarcation. ● Traffic history and expected growth ● Alternate suggestions to key routes. ● Prediction based infra changes like flyover, underpass 	<p>Please Use Open Source to build Solutions</p> <p>Use of programming language such as Python or R</p> <p>Road traffic analysis can be done by using geospatial coordinates (free Google Map APIs), social media inputs (pulling real time traffic updates from Twitter, e.g. as implemented here.</p> <p>NoSQL for large data storage</p> <p>Time series algorithms such ARIMA or using Recurrent Neural Networks such as LSTM</p> <p>Anomaly detection using any classification algorithm such as Random Forest, Bayesian etc.</p>

14. Infosys - Smart Citizen Sensing

Mobility

Use Case Description	What is expected	Suggested technology
<p>Build a Smart App for Citizens Government Collaboration.</p> <p>The application enables citizens to report local problems such as potholes, illegal trash dumping, faulty street lights, broken tiles on sidewalks, and illegal advertising boards.</p> <p>A digitized platform to report such issues will avoid redundant complaints, easier access for remote issues to government, and ensure a streamlined action. For citizens to put a complain, they can always check for a similar complaint to be made, and add their digital signatures to add the impact of a particular issue.</p>	<p>Create a solution where citizens can report potential threats and streamline with Municipality, Hospitals, Fire stations and other Government NGO functions for timely help to ensure minimal issues to humans, animals and property. Suggested Different functions are</p> <ul style="list-style-type: none"> ● Road and Safety ● Stray animals (injured / public nuisance) ● Area Power disruptions ● Govt property malfunction (street lights, poles, signboards) ● Trash – collection issues ● Fire hazards ● Drainage issues <p>Govt data is sensitive information hence a robust solution for protecting data privacy would be of a key concern.</p>	<p>Please Use Open Source to build Solutions Android/IOS apps.</p>

15. PGI

Healthcare

Case Description	What is expected	Suggested technology
<p>PGIMER Chandigarh is a tertiary care institution of immense national importance to the Country. Spread in <u>several acres (~277)</u>, the institute are committed to provide high quality medical services to every citizen. As per the current data, everyday more than 20,000 patients including attendants visit to these tertiary care centers. <u>Due to the vast campus size, patients keep roaming across buildings to deposit fees, samples, reports collection etc.</u> These patients tend to get lost while roaming between the buildings (or within the building) or counters. Moreover, the battle point is for Stroke, MI and Paediatric emergency cases where every second counts and patient needs to be taken to specialist immediately.</p> <p>The objective is to build a mobile app technology to navigate seamlessly from outside the hospital and all the way into a specific hospital ward/ counter.</p>	<p>The patients, visitors and staff will be offered the most optimal route to their location which including stairs, elevators or ramp all the way into a specific hospital ward/ counter/ Room No.</p> <p>This will reduce interruptions of PGI staff being asked for directions.</p>	<p>Our app addresses both indoor and outdoor real time navigation.</p> <p>Moreover, the app operates without any requirement of Wifi, Mobile data or Bluetooth beacons for indoor navigation.</p>

16. Agnext

AI/ML

Case Description	What is expected	Suggested technology
<ol style="list-style-type: none">1. Monitor traffic violators aiming to reduce traffic violation incidents and also reducing manpower to monitor it.2. Suggest congestion free route to avoid time delays, violations and fuel consumption.3. Information about emergency vehicles like ambulance should be propagated to other vehicles with information about lane etc to avoid time delay.4. Provide information of parking space available to avoid wastage of time and fuel consumption.		

17. Seasia

AI-ML / Agriculture / IOT/Electric Mobility

S.No	Use Case Description	What is Expected	Suggested Technology
1	<p>India being a highly Agriculture dependent country has direct impact of the agriculture productivity on Economy. We feel there are two actors we can handle to increase the productivity:</p> <ol style="list-style-type: none">1. Disease detection in plants plays an important role in agriculture field.2. Guidance on which crop to produce based on composition of soil.	<p>Create an Image Recognition and Segmentation based ML model to allow Farmers upload images of the leaves to get to know the possible disease and suggest remedies.</p> <p>Farmers can upload Soil composition report from a lab to the system and can get the info on what Crop is best to be produced as per the composition, Weather and the area with a plan for next 5 year.</p>	<p>Machine Learning for Image Recognition and Segmentation to compare two images and tell possible disease.</p> <p>Use Decision Based, Instance and Regression Machine Learning Algorithms to propose a crop and the 5 year plan and per the input.</p>

<p>2</p>	<p>Traffic congestion and pollution is on the rise. CO2 emission through transportation is huge and reaching dangerous levels. We need to find an eco-friendly mode of transit, sooner the better.</p> <p>The deployment of the e-mobility solution has the potential to control these two problems if not completely solve them. Many corporate giants are investing in e-mobility solutions.</p>	<p>Developing an e-scooter sharing app that will allow users to locate e-scooters, unlock the scooter, and full tracking of the routes with GPS tracker. The platform will also facilitate the user to make payments online.</p> <p>We have already developed this software system and tested with actual physical scooters. Some further modification like improving the user experience, recording statistics, strengthen the security features and saving these electronic scooters from being stolen are being worked on. We imported few scooters from China, but we would need to manufacturer them within the country to save cost.</p>	<p>IOT system to be embedded in the scooters for locking/unlocking them, tracking & security along and fetching other essential information.</p> <p>Mobile Apps: Android and IOS</p> <p>MongoDB, Node for backend and APIs</p>
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3	<p>In today's modern era, keeping track of your health is very important and crucial task. There are many solutions available in market but society needs a solution that is plug-n-play, secure, robust and smart enough to predict the possibilities of healthcare issues that can occur to a person based on his/her historical health records. Moreover our agenda is to make hospitals smart using gigantic power of technology.</p>	<p>Our solution targets following domains in healthcare:</p> <ol style="list-style-type: none"> 1. Keeping Track of patient's stats 2. AI and ML for generating automatic SOS alerts for Hospital Staff and assigned doctors 3. Historical records 4. Monitoring Nuclear radiations level 5. Monitoring patients' real time positioning 	<p>Use of Beacons, Smartwatches, Dosimeter, Bio harness in compliance with HIPPA to capture various data and Use AI/ML to predict and alarm.</p>
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18. XLPAT LABS

Case Description	What is expected	Suggested technology
<p>1. Natural Language Generation: Generate a summary of graphs to be used in our tool. Samples: https://github.com/simplenlg/simplenlg https://www.npmjs.com/package/nlg</p> <p>2. 3d Model generation library: Generate 3d graphs in obj format. Input map with key-value pairs and retrieve an obj file format https://poly.google.com/view/dW-lHeJui7h</p> <p>3. Text Standardization and Cleaning: Write intelligent models to predict similar names written in different formats and clean them into a single standardized format. For example, Sawan Mehta, Mehta Sawan, S Mehta are the same names.</p>		

19. "Gurpartap Singh" <gurpartapsingh1990@gmail.com>

Case Description	What is expected	Suggested technology
<p>Design a model which can learn a particular handwritten language, not just the pattern in the images but can actually classify alphabets in words. Today with such powerful models we can achieve accuracy in classification of these alphabets but can you train your model such that this can be further used to classify words, read sentences and convert hand written documents to electronic ones.</p> <p>Dataset :- https://www.kaggle.com/ashokpant/devanagari-character-dataset https://cvit.iiit.ac.in/research/projects/cvit-projects/indic-hw-data</p>		

20. Indian Oil

Case Description	What is expected	Suggested technology
<p>At the plant: Trucks with empty cylinders report for unloading at bay. Truck floor is normally 4 feet high from ground level so concrete platforms are made; 3 meter's width, 4 feet height and length of 15 meters. These platforms are called fingers. On these fingers chain conveyor is fixed having telescopic boom which can go inside the truck and move out at slow speed. This boom is moved to facilitate laborers for placing cylinders on this within the truck closer to the stacks one by one. Normally two laborers get deployed either for unloading of empty cylinders or loading the filled cylinders using telescopic booms of conveyors driven electrically.</p> <p>This is labor oriented job and has limitation for continuous working as labor gets fatigued thus back up labor required as production is online. Apart from this labor, can only unload / load at particular speed thus bottleneck for fast loading / unloading requirement. Now a day with electronic cylinder filling, the speed of equipment is higher and labor is not able to match.</p> <p>At distributors Godowns also when truck reaches with filled cylinders labor has to pick each cylinder from the truck which is about 4 feet high from ground and manually lower on the ground then shift to godown. Same way labor will pick up empty cylinder from godown and place into truck manually. At distributor end trucks get hold up to 4-12 hours depending on plain/hilly areas. These are normally either at low terrain or high depending upon geography of area.</p>	<p>Looking forward for a robust, durable, mechanized sustainable automated solution to replace labour at plant and at distributors' godown; there by reducing loading unloading time as well. Solution could be in the form of electronic / mechanical / hydraulic machine or mobile robot. But we will prefer fully automated machine or remote operated by the person for plant and others for distributor end in the beginning.</p>	

21. "Vineet Khurana" <vineet@chandigarhangersnetwork.com>

Case Description	What is expected	Suggested technology
<p>With 400Mn+ Diabetes, 60Mn+ Glaucoma, 200Mn+ Thyroid, 1Bn+ Hypertension patients across the globe and a very minuscule number of ophthalmologists and retina specialists, the world is moving towards a Eye Catastrophe which can be only be solved at scale using technology.</p> <p>The manual retina scan observations by doctors are inefficient and often inaccurate. If artificially intelligent algorithms can bring more efficiency to the scanning process, there will be better diagnostics and remedies.</p>		

Open Use Case

The participants have option to build a use case of their choice, provided it meets following conditions:

1. Theme is to be based as per the Startup Punjab Hub @ STPI.
2. Open Source Technology is used.
3. Use case is vetted by core committee of STPI Open Challenge Program.