**Project Design Phase-II**

**Technology Stack (Architecture & Stack)**

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| --- | --- |
| Team ID | PNT2022TMID35327 |
| Project Name | Emerging methods for early detection of forest fires |
| Maximum Marks | 4 Marks |



**Technical Architecture**

**:**

No fire detected

in the forest

Trained CNN

model

Twilio

service

Alert the customers

about the fire by

sending messages

Fire detected

Picture taken

from the

monitoring

system

Forest

CNN

deployment

on IBM

Training the

CNN model

**Table-1 : Components & Technologies:**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No** | **Characteristics** | **Description** | **Technology** |
| 1. | Open-Source Frameworks | The open-source frameworks Twilio service, IBM cloud, | Technology of IBM cloud is software as a service & Infrastructure as a service, technology of twilio service is TwiML. |
| 2. | Security Implementations | The securities are mainly related to the cloud services, they have strict security across the network. | Twilio is certified under ISO/IEC/27001, and it supports TLS 1.2 encryption.  IBM cloud encrypts the data in |

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No** | **Component** | **Description** | **Technology** |
| 1. | User Interface | The user interacts with the application . | Python |
| 2. | Application Logic-1 | The Logic for performance of the process to execute the desired output | Python |
| 3. | Application Logic-2 | IBM is used to deploy the CNN model | IBM service |
| 4. | Database | (Pictures ) Composite Data Type | MySQL. |
| 5. | Cloud Database | Database Service on Cloud | IBM Cloudant etc. |
| 6. | File Storage | Files like dataset for the use of training and testing can be stored in local system. | IBM Block Storage or Other Storage Service or Local Filesystem |
| 7. | External API-1 | Purpose of External API used | IBM API, twilio rest API |
| 8. | Machine Learning Model | Purpose of Machine Learning Model is it allows the user to feed a computer algorithm an immense amount of data and have the computer analyze and make data-driven recommendations and decisions based on only the input data. | Object Recognition Model, CNN |
| 9. | Infrastructure (Server / Cloud) | Application Deployment on Cloud | IBM Cloud |

**Table-2: Application Characteristics:**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No** | **Characteristics** | **Description** | **Technology** |
|  |  | And the Twilio service also maintains standards to ensure data is appropriately stored. | databases and storage with built-in encryption. |
| 3. | Scalable Architecture | Many fire risk models make use of forest fire databases to construct and assess the probabilistic model.  It is an effective way to minimize the damages caused by forest fire in the early detection of forest fire. | As artificial intelligence is used it gives appropriate detection of fire occurrence in the forest. |
| 4. | Availability | As the functional requirements are mostly open sources, they are highly available to all. Anyone can make use of it. | (Open source ) python |
| 5. | Performance | After repeated training and testing, the forest fire prediction results based on the convolution neural network would be found to be appropriate in most of the times.  When the fire in the forest is detected the alerting message will be sent to the customers (clients).  So that they can prevent the major damages caused by the fire. | IBM cloud makes the process more feasible. |