A

Major Project

On

**Automating E-Government Feedback Services with Machine Learning And Artificial Intelligence**

(Submitted in partial fulfilment of the requirements for the award of Degree)

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**CMR TECHNICAL CAMPUS**

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**2018-22**

# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING


## CERTIFICATE

This is to certify that the project entitled "**Automating E-Government Feedback Services with Machine Learning And Artificial Intelligence**" being submitted by **G. Sai Chand Goud (187R1A0522), Roshan Christuraj (187R1A0542),Bathini Hemanth (187R1A0507), Dendukuri Keerthi (187R1A0518)** in partial fulfilment of the requirements for the award of the degree of B.Tech in Computer Science and Engineering to the Jawaharlal Nehru Technological University Hyderabad, is a record of bonafide work carried out by him/her under our guidance and supervision during the year 2021-22.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

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# ABSTRACT

Recently, AI has boosted the existing state of the art in a growing number of sectors. Some challenges exist that hinder its widespread implementation in e-government applications, both for the advancement of e-government systems and for people' interaction with government. E-government systems face various hurdles, and in this study, we present a framework that employs AI technology to automate and facilitate e-government services. For begin, we'll draw out a strategy for managing e-government data assets and information. This is followed by construction of a set of deep learning models targeted at automating numerous government services. On top of that, we've presented an electronic government platform architecture that makes it easy to build and implement AI functionalities. With the aim of reducing processing times, cutting costs, and enhancing citizen happiness, we're aiming to upgrade the current status of e-government services by adopting proven AI approaches

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## 1.1 PROJECT SCOPE

E-government is the application of employing advanced electronic techniques–and web services–to present, exchange, and advance the government's services for citizens and businesses with a goal of improving the productivity while reducing the cost. E-government plays a critical role in advancing the economy of the government, citizens, and industry, especially for developing countries. It facilitates the business-to-business transactions and tasks, brings customers closer to businesses, allow productive interactions between the government and citizens, government and enterprises, and inter-agency and relationships is more convenient, transparent and economic ways.

## 1.2 PROJECT PURPOSE

The ultimate goal of the e-government is to enhance the quality and efficiency of the government services while reducing cost. Moreover, implementing e-government applications can faster several other advantages including, but not limited to transparency, trust, citizen participation, environment support. Providing access to services and government information via transparent and easy-to-use technologies can critically enhance the trust between citizens and government.

## 1.3 PROJECT FEATURES

In this project, we propose a novel framework that utilizes recent advances in AI to improve the e-government systems and their interactions with the citizens. First, we propose a framework to automate and facilitate the management of e-government systems using AI techniques. Second, we develop and present several deep learning models that aim at automating e-government services for Arabic speaking countries including automatic recognition of hand-written digits and letters and sentiment analysis. Third, we propose an platform for smart e-government services development and implementation.

# 2.SYSTEM ANALYSIS

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System Analysis is the important phase in the system development process. The System is studied to the minute details and analysed. The system analyst plays an important role of an interrogator and dwells deep into the working of the present system. In analysis, a detailed study of these operations performed by the system and their relationships within and outside the system is done. A key question considered here is, "what must be done to solve the problem?" The system is viewed as a whole and the inputs to the system are identified. Once analysis is completed the analyst has a firm understanding of what is to be done.

## 2.1 PROBLEM DEFINITION

A detailed study of the process must be made by various techniques like Image processing, feature recognition etc. The data collected by these sources must be scrutinized to arrive to a conclusion. The conclusion is an understanding of how the system functions. This system is called the existing system. Now the existing system is subjected to close study and problem areas are identified. The designer now functions as a problem solver and tries to sort out the difficulties that the enterprise faces. The solutions are given as proposals. The proposal is then weighed with the existing system analytically and the best one is selected. The proposal is presented to the user for an endorsement by the user. The proposal is reviewed on user request and suitable changes are made. This is loop that ends as soon as the user is satisfied with proposal.

## 2.2 EXISTING SYSTEM

E-government is the application of employing advanced electronic techniques–and web services–to present, exchange, and advance the government's services for citizens and businesses with a goal of improving the productivity while reducing the cost. E-government plays a critical role in advancing the economy of the government, citizens, and industry, especially for developing countries. It facilitates the business-to-business transactions and tasks (B2B), brings customers closer to businesses (B2C), allow productive interactions between the government and citizens (G2C), government and

enterprises (G2B), and inter-agency and relationships (G2G) in more convenient, transparent and economic ways

## 2.3 LIMITATIONS OF EXISTING SYSTEM

- Time consuming
- High Maintenance cost
- Inaccessibility
- Lack of productivity

.

## 2.3 PROPOSED SYSTEM

The aim of proposed system is to develop a system of improved facilities. The proposed system can overcome all the limitations of the existing system. The system provides higher accuracy and reduces the error rate .The existing system has several disadvantages and many more difficulties to work well. The proposed system tries to eliminate or reduce these difficulties up to some extent. The proposed system helps the user to work user friendly and he can easily do his jobs without time lagging.

### 2.3.1 ADVANTAGES OF THE PROPOSED SYSTEM

The system is very simple in design and to implement. The system requires very low system resources and the system will work in almost all configurations. It has got following features

- HAND-WRITTEN LETTERS RECOGNITION
- HAND-WRITTEN DIGITS RECOGNITION
- SENTIMENT ANALYSIS
- FACIAL EXPRESSION ANALYSIS

## 2.4 FEASIBILITY STUDY

The feasibility of the project is analysed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. Three key considerations involved in the feasibility analysis are

- Economic Feasibility
- Technical Feasibility
- Social Feasibility
-

### 2.4.1 ECONOMIC FEASIBILITY

The developing system must be justified by cost and benefit. Criteria to ensure that effort is concentrated on project, which will give best, return at the earliest. One of the factors, which affect the development of a new system, is the cost it would require.

The following are some of the important financial questions asked during preliminary investigation:

- The costs conduct a full system investigation.
- The cost of the hardware and software.
- The benefits in the form of reduced costs or fewer costly errors.

Since the system is developed as part of project work, there is no manual cost to spend for the proposed system. Also, all the resources are already available, it give an indication of the system is economically possible for development.

### 2.4.2 TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

### 2.4.3 BEHAVIORAL FEASIBILITY

This includes the following
Is there sufficient support for the users?

Will the proposed system cause harm?

The project would be beneficial because it satisfies the objectives when developed and installed. All behavioural aspects are considered carefully and conclude that the project is behaviourally feasible.

## 2.5 HARDWARE & SOFTWARE REQUIREMENTS

### 2.5.1 HARDWARE REQUIREMENTS

Hardware interfaces specifies the logical characteristics of each interface between the software product and the hardware components of the system. The following are some hardware requirements.

| | | |
|---|---|---|
| Processor | : | i3 2.30 GHz. |
| Hard disk | : | 40 and above. |
| RAM | : | 4GB and above. |
| GPU | : | 2GB(optional) |

### 2.5.2 SOFTWARE REQUIREMENTS

Software Requirements specifies the logical characteristics of each interface and software components of the system. The following are some software requirements,

| | | |
|---|---|---|
| Operating system | : | Windows 10 |
| Languages | : | Python |
| Backend | : | Machine Learning |
| IDE | : | Jupyter |
| Date sets | : | Data sets from Online Resources |

# 3.ARCHITECTURE

# 3. ARCHITECTURE

## 3.1 PROJECT ARCITECTURE

The management of information resources plays a critical role in the overall pipeline of e-government services from collecting end-user data, to storage, and processing. we propose an architecture for centralized management of e-government information resources that mainly focuses on the utilization of AI, Big Data, and Internet of Things.

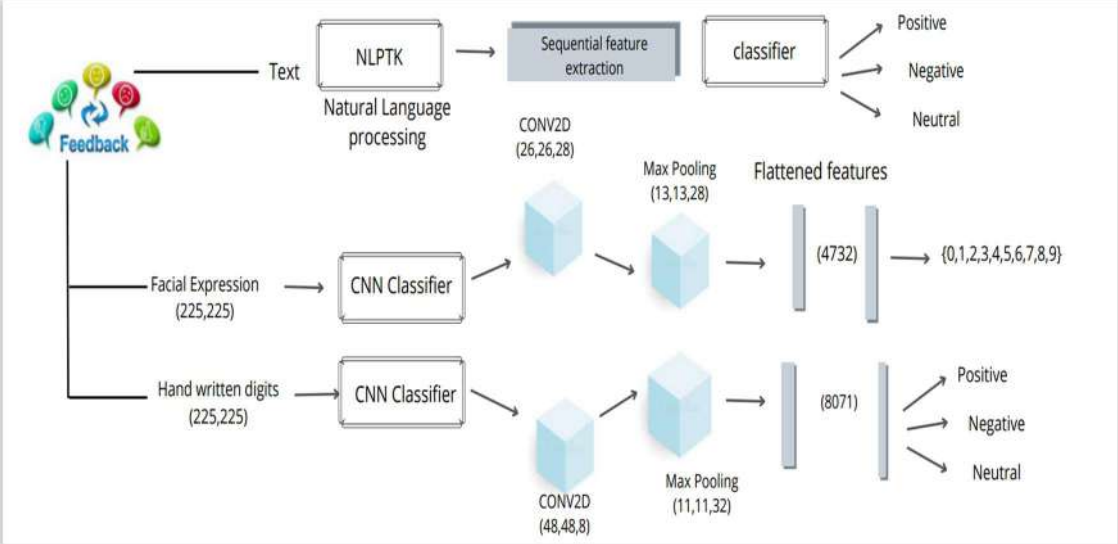



Figure 3.1: An architecture overview for a centralized e-government information management framework

Our proposed framework consists of four main components: Government Collective Office Network, Big Data Services Centre, Social Public and Research, and Intelligent Archives. These components utilize the advances in cutting-edge technology to enhance and facilitate the production, processing, and presentation of e-government resources, including, Cloud Computing services, Internet of Things, AI, and Storage utilities. The Government Collective Office Network is responsible to implement and ensure the correctness of e-government policies and services in alignment with all government offices and agencies. Big Data Services Centre is responsible for all processes and policies regarding Big Data (collecting, storing, processing, transmitting). Moreover, this unit plays a critical role in ensuring the privacy and security of the citizens and

government data. Social Public and Research is the unit responsible for providing e-services for the citizens and research organizations. It also includes a research agency concerned with advancing the current state of e-government ecosystem. Intelligent Archive unit is responsible to digitize paper documents and applications and provide smart and personalized services to other units that require accessing and consuming digital data.

### 3.2 USE CASE DIAGRAM

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures..

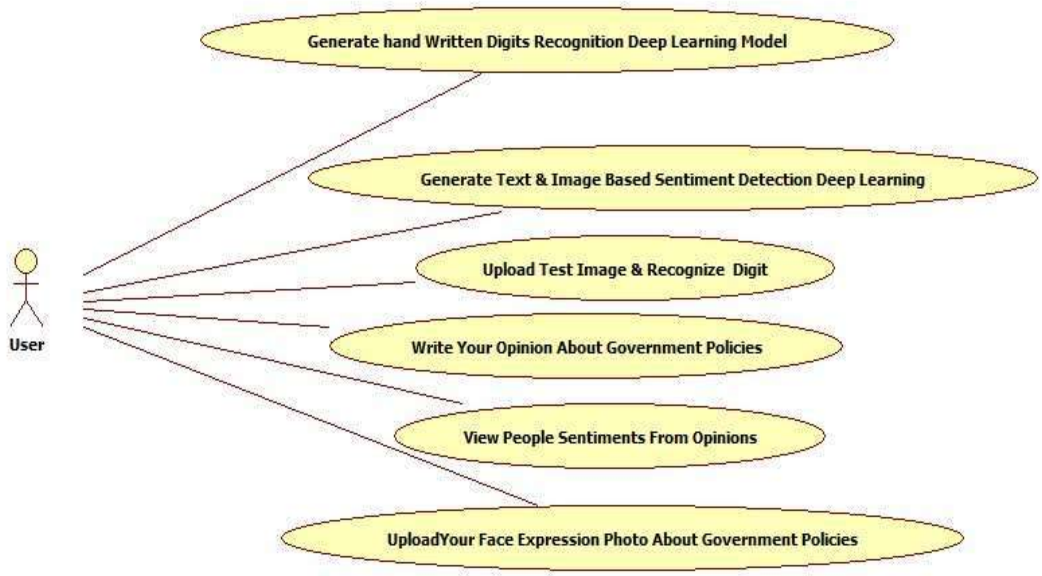



Figure 3.2: Use Case Diagram for E-government Systems

### 3.3 CLASS DIAGRAM

Class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also for constructing executable code of the software application.

Class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class diagrams are widely used in the modeling of objectoriented systems because they are the only UML diagrams, which can be mapped directly with object-oriented languages.

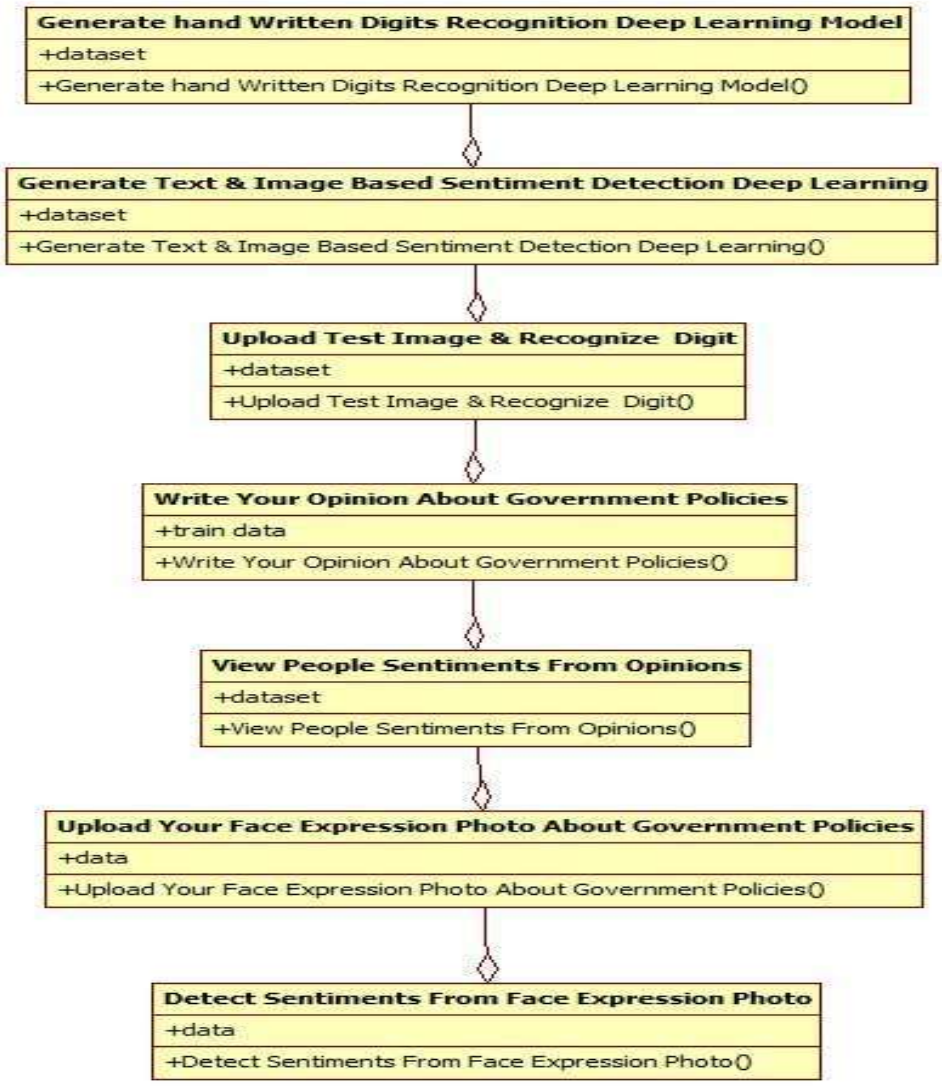



Figure 3.3: Class Diagram for E-government Systems

### 3.4 DATA FLOW DIAGRAM

A data flow diagram shows the way information flows through a process or system. It includes data inputs and outputs, data stores, and the various subprocesses the data moves through. DFDs are built using standardized symbols and notation to describe various entities and their relationships.

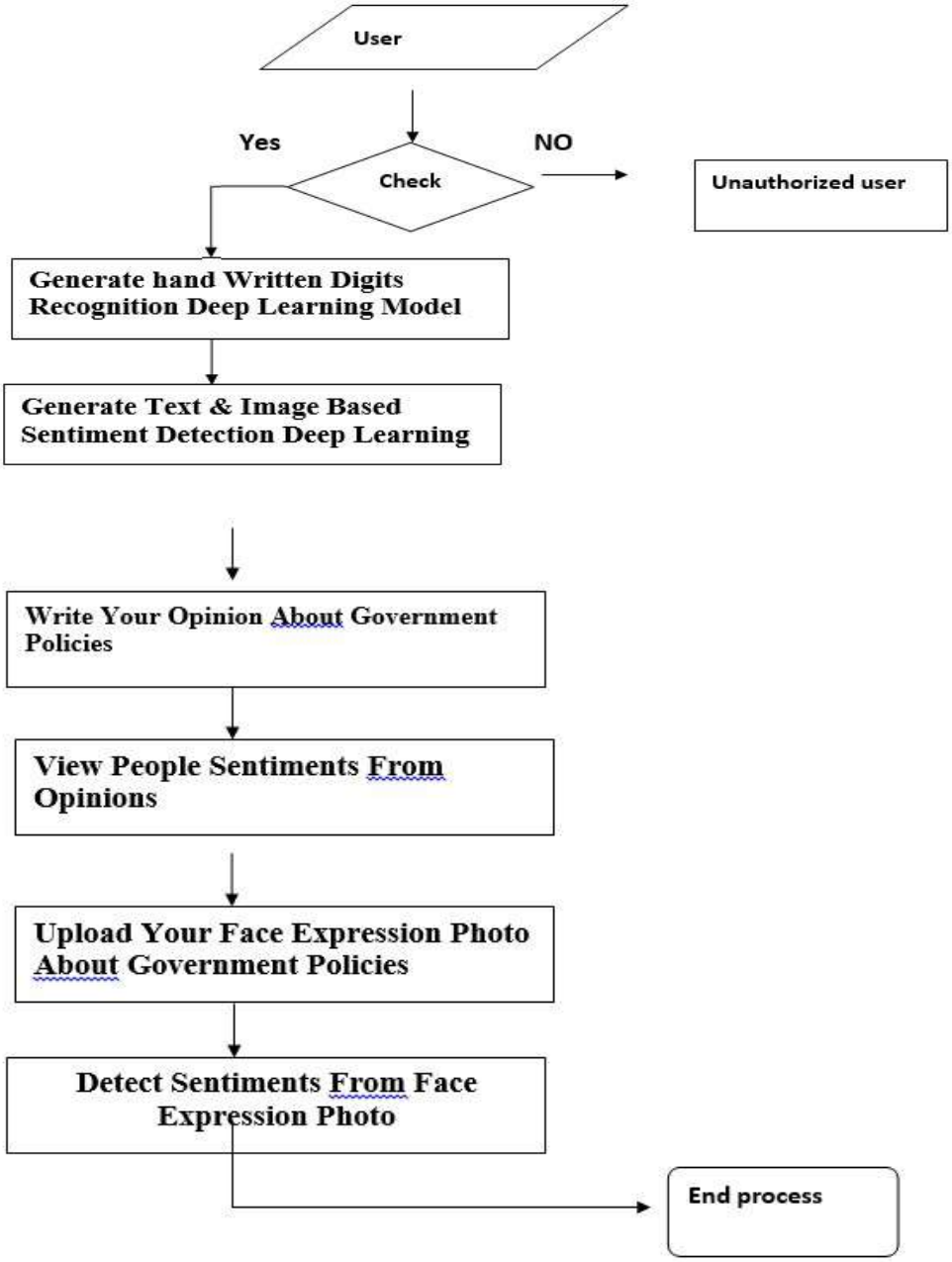



Figure 3.4: Flow diagram for E government Systems

## 3.5 ACTIVITY DIAGRAM

We use Activity Diagrams to illustrate the flow of control in a system and refer to the steps involved in the execution of a use case. We model sequential and concurrent activities using activity diagrams. So, we basically depict workflows visually using an activity diagram. An activity diagram focuses on condition of flow and the sequence in which it happens. We describe or depict what causes a particular event using an activity diagram.

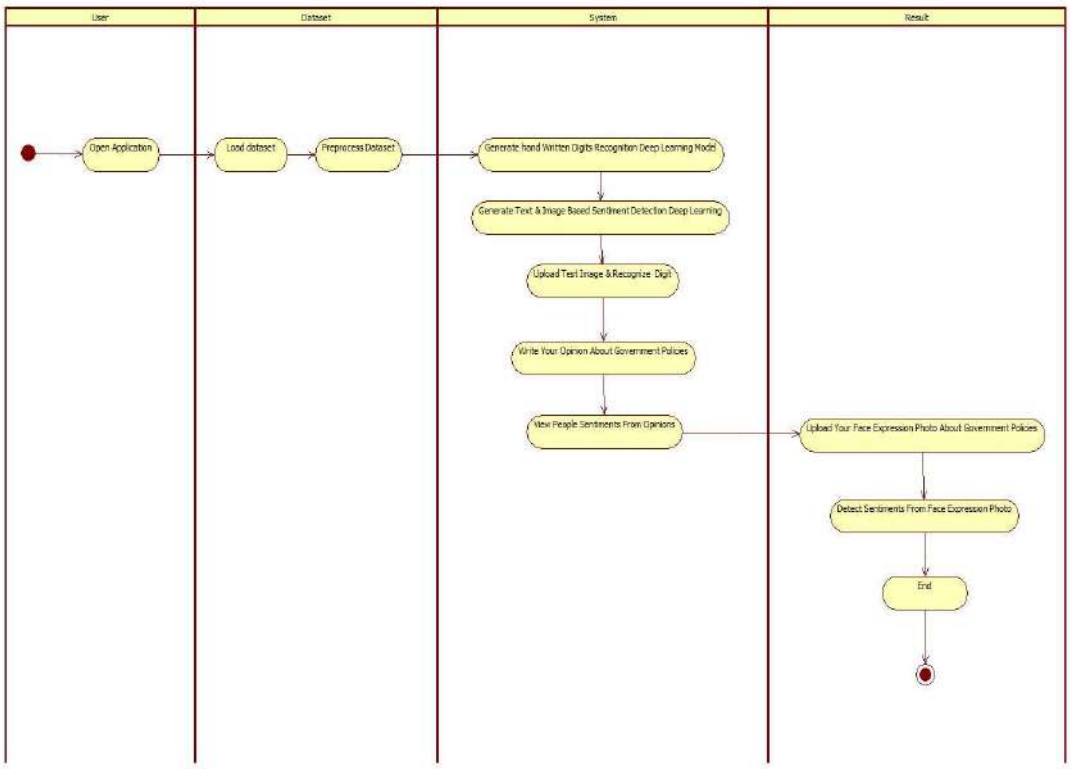



Figure 3.5: Activity Diagram for E-government System

### 3.6 STATE DIAGRAM

In a state diagram, as the name suggests, each object in the system is represented by a separate state. The system's objects undergo state transitions in response to external events. State diagrams are also used to show how an object's current state changes over time, in response to events in the system.

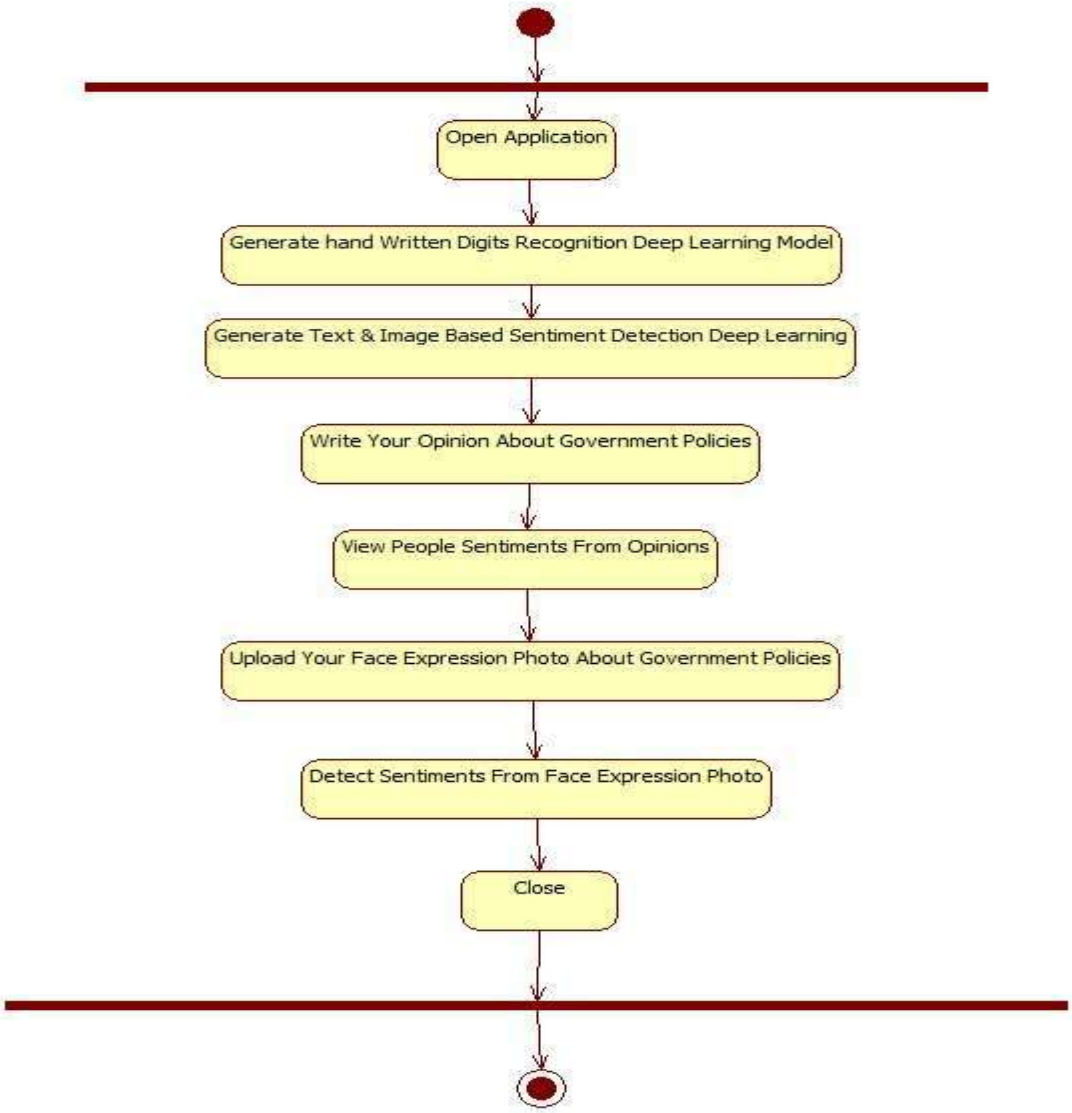



Figure 3.6: State Diagram for E-government System

### 3.7 SEQUENCE DIAGRAM:

A sequence diagram depicts the relationships among the various parts of a system. Chronological order is the most important characteristic of any sequencediagram. As ano ther way of saying that everything is shown in sequential sequence, thisThere are several "messages" passed between the diagram's many elements.

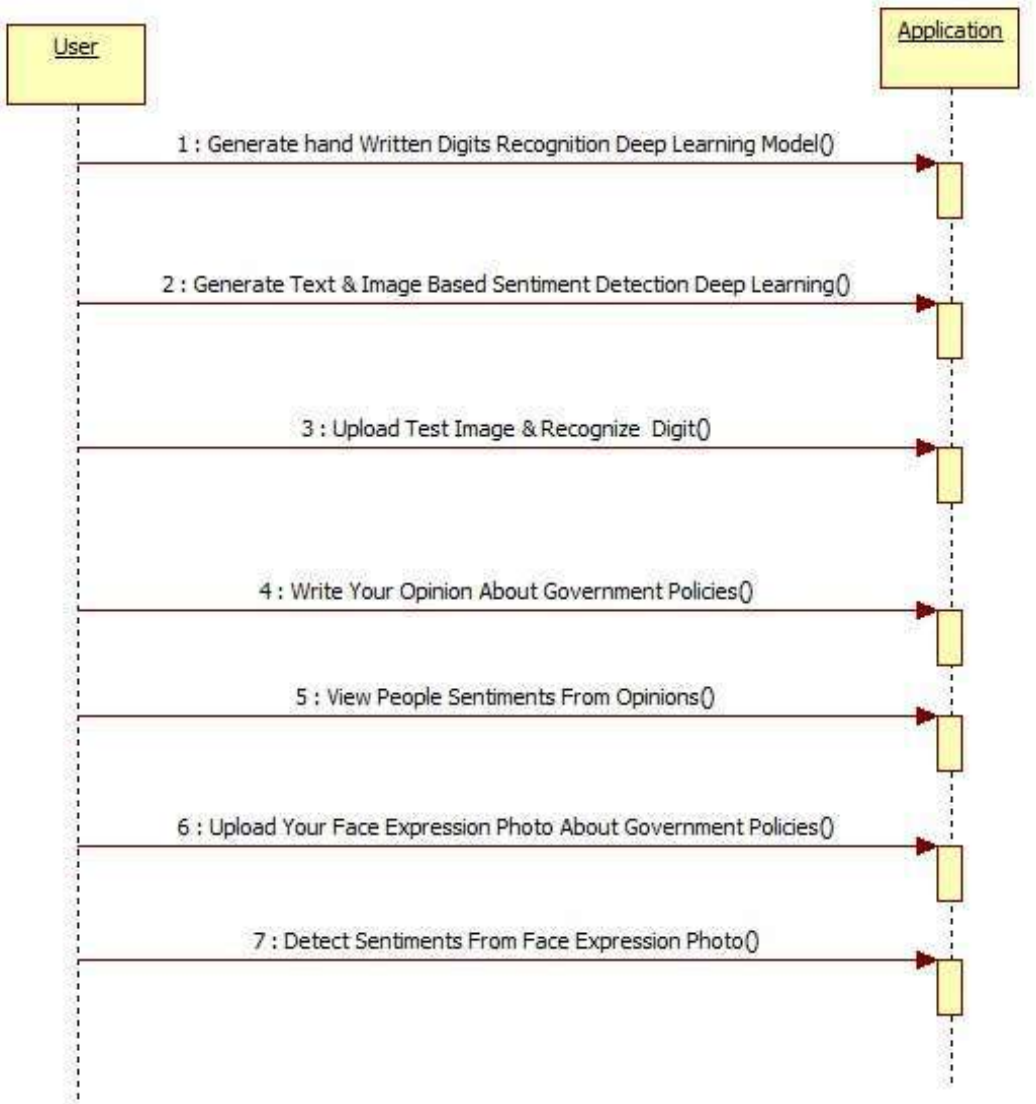



Figure 3.7: Sequence diagram for E-government System

# 4.IMPLEMENTATION

# 4. IMPLEMENTATION OF SYSTEM

## 4.1 MODULES DESCRIPTION:

1) Recognize handwritten digits generated by the generator CNN-based handwritten models that use digit images as input and then predict the number's name using this model are being developed using Deep Learning. In order to create a CNN model, you must first take two types of images, known as train and test, which comprise all the conceivable forms of digits that a human may write (Using test images train model will be tested whether its giving better prediction accuracy). In order to develop a training model, CNN will use all train images. We'll use train images to extract features and then create a model as we're creating the model. In order to classify the test image, we will first extract features from the image and then apply the train model to it.

2) Develop Sentiment Analysis Using Text and Image Data Using this module, we will create a sentiment detection model based on text and images. To create a text-based sentiment model, we'll employ any and all available words, both positive and negative. A emotion model based on photos of facial expressions will be created. Inputs such as text or images will be fed into a training model, which will then attempt to infer the sentiment behind them.

In order to use this module, we will submit a text image and apply a train model to recognize digits by utilizing this module.

In this module, we'll collect the user's opinion and save it in the program so that sentiment can be detected from the user's opinion.

All users' opinions can be viewed in this module, as well as their sentiments as determined by the CNN model.

When asked about government policies, the user can upload a photograph of their face expression and indicate whether or not they are satisfied with the system.

Different users can see the facial expression image and the identified sentiment that previous users have uploaded using this module.

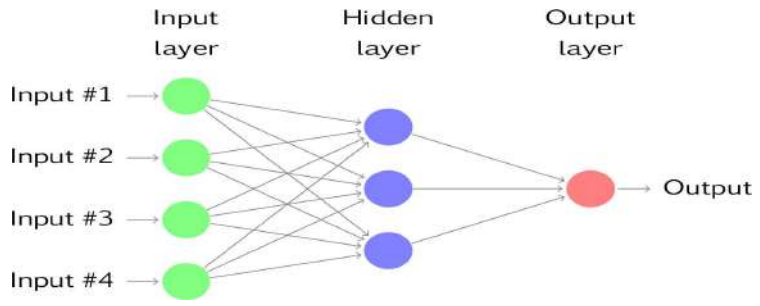
## 4.2 CNN :

Using AI to automate government functions, such as the Convolution Neural Networks Deep Learning algorithm, is discussed in this study (CNN). For the government, launching new projects online provides an opportunity to engage directly with its citizens, who may then read about them in the media and express their views in blog postings and other public criticism. In order to automatically detect public opinion on plans, artificial intelligence software similar to human brains is required, and this program must be able to tell if the opinions stated are good or negative.

To design an automated opinion detection system, the author recommends using a CNN model that functions like a human brain. Automatic decision-making without human intervention is possible with this CNN model, which can be built for a variety of services. For any service, we can construct this CNN model. Human handwritten digits can be detected and recognized by one model, while sentiment from text sentences describing government goals can be detected by another. To suggest this technique, the author has already described the concept of applying several models. As part of our expansion, we've added a new model that can detect emotions in a photograph of a person's face. The expressions on a person's face are significantly more powerful than words or sentences at conveying their emotions. ' As a result, we've created a new application for our business that uses face pictures to gauge a person's emotional condition.

Using a convolutional neural network, we will demonstrate how to design an image classifier that can identify and distinguish between two images. The smaller the network, the more efficient it will be on a CPU. Traditional neural networks that are good at photo classification take a long time to train because they contain a lot of parameters and demand a lot of computing power. However, our goal is to explain how to build a real-world convolutional neural network utilizing TENSORFLOW.

When it comes to solving optimization problems, neural networks are mathematical models that can be applied. Neurons are the building blocks of neural networks because they serve as the basic computational unit. As an example, a neuron gets an input (say, x) and does some computation on it (say, multiplying it by w and then adding another variable b). For a neuron to produce its final output (activation), an activation function (f) is used. There are many different types of activation functions. One of the most commonly used activation functions is sigmoid. Neurons that use the sigmoid function are called "sigmoid neurons," and this term refers to neurons that are stimulated by this function. RELU and TanH are two examples of neurons whose activation functions are named after them.



**4.3 SAMPLE CODE:**

```
 from tkinter import messagebox
from tkinter import *
from tkinter import simpledialog
import tkinter
from tkinter import filedialog
from tkinter.filedialog import askopenfilename
import matplotlib.pyplot as plt
import numpy as np
import joblib
# from sklearn.externals import joblib
from keras.models import load_model
from keras.preprocessing.image import img_to_array
import cv2
from keras.models import model_from_json
from keras.preprocessing import image
# from keras.optimizers import Adam
from keras.utils import np_utils
from keras.preprocessing import image
import os
from numpy import dot
from numpy.linalg import norm
from keras.models import Sequential
from keras.layers import Dense, Conv2D, Dropout, Flatten, MaxPooling2D
import imutils
import nltk
main = tkinter.Tk()
main.title("Automating E-Government")
main.geometry("1300x1200")
mainframe=Frame(main,bg="pink")
mainframe.pack(fill='both',expand=True)

global filename
global text_sentiment_model
```

```
EMOTIONS = ["angry", "disgust", "scared", "happy", "sad", "surprised", "neutral"]
global face_detection
global image_sentiment_model
global digits_cnn_model
def digitModel():
    global digits_cnn_model
    with open('models/digits_cnn_model.json', "r") as json_file:
        loaded_model_json = json_file.read()
        digits_cnn_model = model_from_json(loaded_model_json)
    digits_cnn_model.load_weights("models/digits_cnn_weights.h5")
    # digits_cnn_model._make_predict_function()
    print(digits_cnn_model.summary())
    text.insert(END, 'Digits based Deep Learning CNN Model generated\n')
def sentimentModel():
    global text_sentiment_model
    global image_sentiment_model
    global face_detection
    text_sentiment_model = joblib.load('models/sentimentModel.pkl')
    text.insert(END, 'Text based sentiment Deep Learning CNN Model generated\n')
    face_detection = cv2.CascadeClassifier('models/haarcascade_frontalface_default.xml')
    image_sentiment_model = load_model('models/_mini_XCEPTION.106-0.65.hdf5',
compile=False)
    text.insert(END, 'Image based sentiment Deep Learning CNN Model generated\n')
    print(image_sentiment_model.summary())
def digitRecognize():
    global filename
    filename = filedialog.askopenfilename(initialdir="testImages")
    pathlabel.config(text=filename)
    text.delete('1.0', END)
    text.insert(END, filename + " loaded\n");
    imagetest = image.load_img(filename, target_size=(28, 28), grayscale=True)
    imagetest = image.img_to_array(imagetest)
    imagetest = np.expand_dims(imagetest, axis=0)
    pred = digits_cnn_model.predict(imagetest.reshape(1, 28, 28, 1))
```

```
 predicted = str(pred.argmax())
    imagedisplay = cv2.imread(filename)
    orig = imagedisplay.copy()
    output = imutils.resize(orig, width=400)
    cv2.putText(output, "Digits Predicted As : " + predicted, (10, 25),
cv2.FONT_HERSHEY_SIMPLEX, 0.7, (0, 255, 0), 2)
    cv2.imshow("Predicted Image Result", output)
    cv2.waitKey(0)
def opinion():
    user = simpledialog.askstring("Please enter your name", "Username")
    opinion = simpledialog.askstring("Government Service Opinion",
                                     "Please write your Opinion about government services & policies")
    f = open("Peoples_Opinion/opinion.txt", "a+")
    f.write(user + "#" + opinion + "\n")
    f.close()
    messagebox.showinfo("Thank you for your opinion", "Your opinion saved for reviews")
def stem(textmsg):
    stemmer = nltk.stem.PorterStemmer()
    textmsg_stem = ''
    textmsg = textmsg.strip("\n")
    words = textmsg.split(" ")
    words = [stemmer.stem(w) for w in words]
    textmsg_stem = ' '.join(words)
    return textmsg_stem
def viewSentiment():
    text.delete('1.0', END)
    with open("Peoples_Opinion/opinion.txt", "r") as file:
        for line in file:
            line = line.strip('\n')
            line = line.strip()
            arr = line.split("#")
            text_processed = stem(arr[1])
            X = [text_processed]
            sentiment = text_sentiment_model.predict(X)
            predicts = 'None'
```

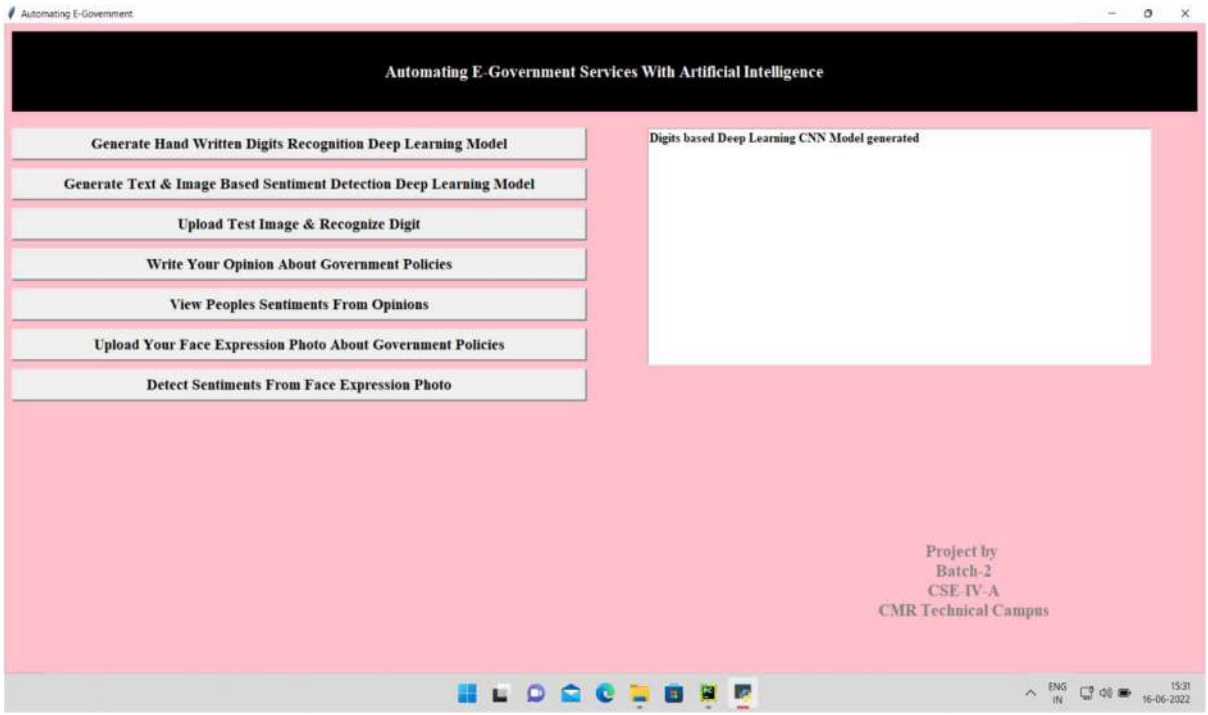
```
        if sentiment[0] == 0:
            predicts = "Negative"
        if sentiment[0] == 1:
            predicts = "Positive"
        text.insert(END, "Username : " + arr[0] + "\n");
        text.insert(END, "Opinion  : " + arr[1] + " : Sentiment Detected As : " + predicts +
"\n\n")
def uploadPhoto():
    filename = filedialog.askopenfilename(initialdir="expression_images_to_upload")
    user = simpledialog.askstring("Please enter your name", "Username")
    policy = simpledialog.askstring("Please enter Government Policy name related to Facial
Expression",
                                    "Please enter Government Policy name related to Facial
Expression")
    img = cv2.imread(filename)
    cv2.imwrite("sentimentImages/" + user + "-" + policy + ".jpg", img);
    messagebox.showinfo("Your facial expression image accepted for reviews",
                        "Your facial expression image accepted for reviews")


def photoSentiment():
    filename = 'sentimentImages'
    for root, dirs, files in os.walk(filename):
        for fdata in files:
            frame = cv2.imread(root + "/" + fdata)
            faces = face_detection.detectMultiScale(frame, scaleFactor=1.1, minNeighbors=5,
minSize=(30, 30),
                                                    flags=cv2.CASCADE_SCALE_IMAGE)
            msg = ''
            if len(faces) > 0:
                faces = sorted(faces, reverse=True, key=lambda x: (x[2] - x[0]) * (x[3] - x[1]))[0]
                (x, y, w, h) = faces
                cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 0, 255), 2)
                temp = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)
                roi = temp[y:y + h, x:x + w]
```

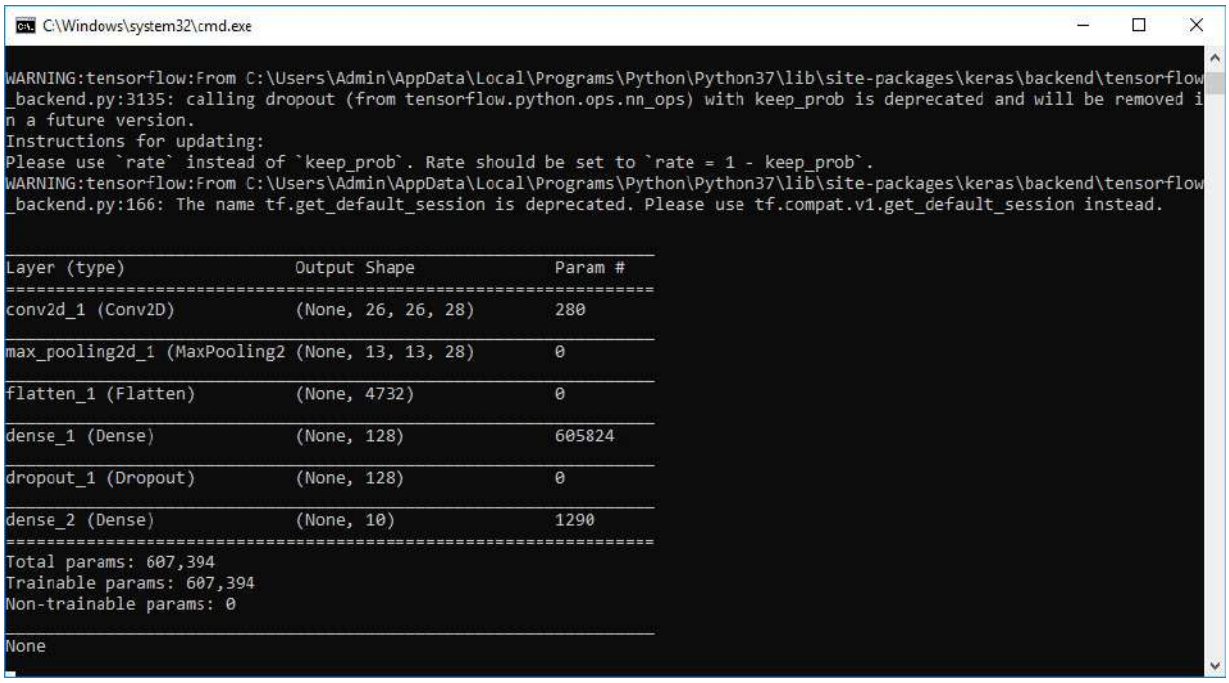
```
            roi = cv2.resize(roi, (48, 48))
            roi = roi.astype("float") / 255.0
            roi = img_to_array(roi)
            roi = np.expand_dims(roi, axis=0)
            preds = image_sentiment_model.predict(roi)[0]
            emotion_probability = np.max(preds)
            label = EMOTIONS[preds.argmax()]
            msg = "Sentiment detected as : " + label
            img_height, img_width = frame.shape[:2]
            cv2.putText(frame, msg, (50, 40), cv2.FONT_HERSHEY_SIMPLEX, 0.5, (0, 0,
255), 2)
            cv2.imshow(fdata, frame)
            messagebox.showinfo(fdata, "Sentiment predicted from Facial expression as : "
+ label)
            if cv2.waitKey(10) & 0xFF == ord('q'):
                break
    cv2.waitKey(0)
    cv2.destroyAllWindows()
main.mainloop()
```

# 5. SCREEN SHOTS

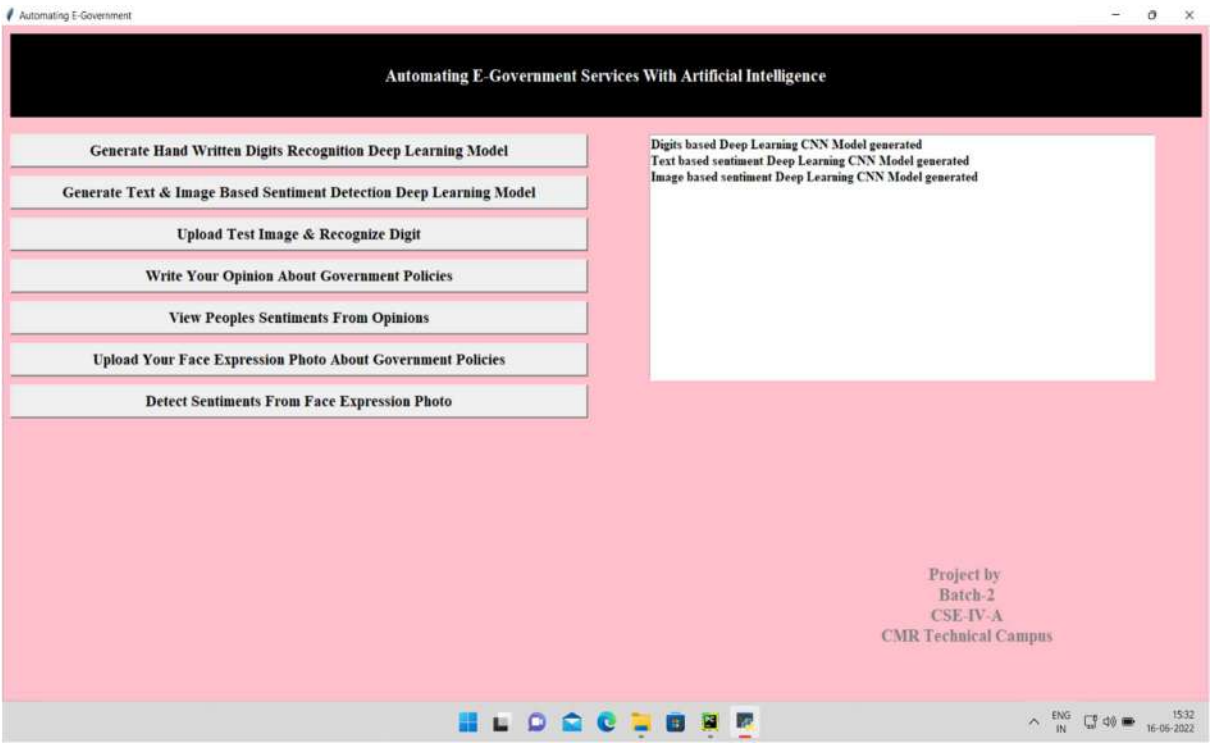
# 5.SCREENSHOTS



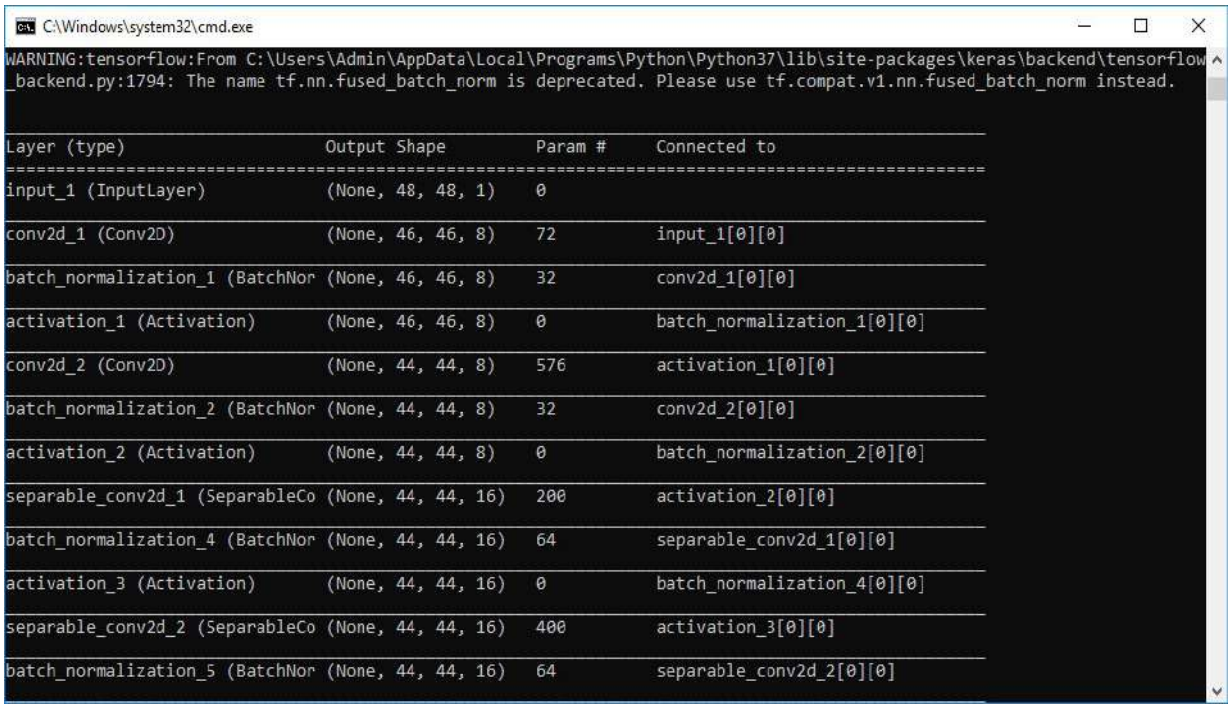

Screenshot 5.1: Digits based deep learning CNN model generated



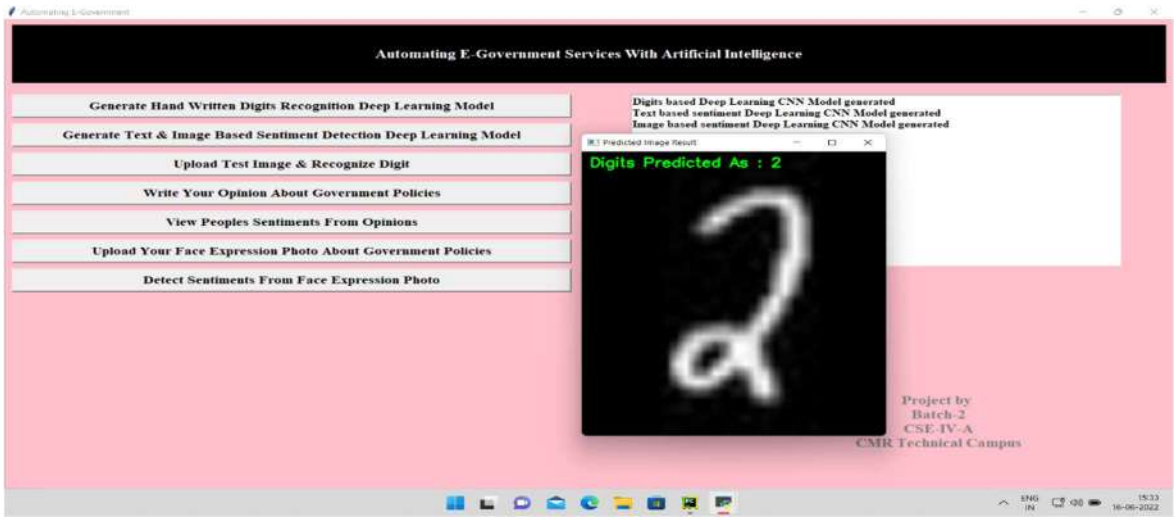

Screenshot 5.2: Digits based deep learning CNN model results



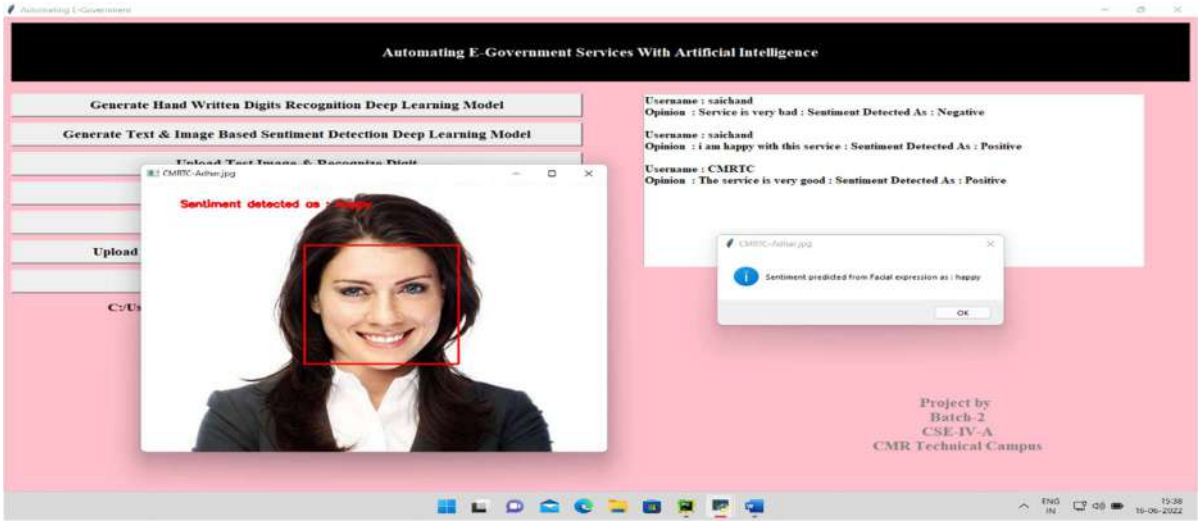

Screenshot 5.3: Sentiment based deep Learning CNN model generated



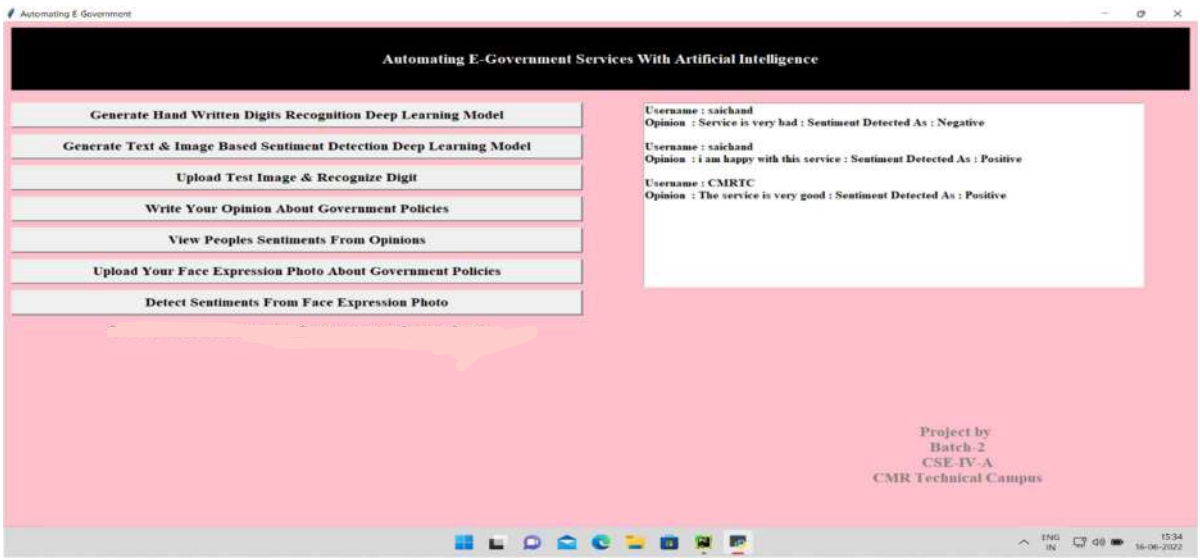

Screenshot 5.4: Sentiment based deep Learning CNN model results




Screenshot 5.5: Digit based deep Learning CNN model detected the digit 2.




Screenshot 5.6 (a): Sentiment based deep Learning CNN model detected facial expression as happy.




Screenshot 5.6 (b): Sentiment based deep Learning CNN model classified entered text.

# 6. TESTING

# 6.TESTING

## 6.1 INTRODUCTION TOTESTING

The purpose of testing is to discover errors. Testing is the process of trying to discovery conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of tests. Each test type addresses a specific testing requirement.

## 6.2 TYPES OFTESTING

### 6.2.1 UNITTESTING

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

### 6.2.2 INTEGRATION TESTING

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

### 6.2.3 FUNCTIONALTESTING

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

| | |
|---|---|
| Valid Input | : identified classes of valid input must be accepted. |
| Invalid Input | : identified classes of invalid input must be rejected. |
| Functions | : identified functions must be exercised. |
| Output | : identified classes of application outputs must be exercised. |

Systems/Procedures: interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes.

## 6.3 TESTCASES

### 6.3.1 UPLOADINGIMAGES

| Test case ID | Test case name | Purpose | Test Case | Output |
|---|---|---|---|---|
| 1 | User uploads image | Use it for identification | The user uploads the digit image | Uploaded successfully |
| 2 | User uploads 2nd image | Use it for identification | The user uploads the a facial expression image | Uploaded successfully |

### 6.3.2 CLASSIFICATION

| Test case ID | Test case name | Purpose | Input | Output |
|---|---|---|---|---|
| 1 | Classification test 1 | To check if the classifier performs its task | Digit one image is given | Detected as digit one |
| 2 | Classification test 2 | To check if the classifier performs its task | Happy facial expression image | The expression detected as happy |
| 3 | Classification test 3 | To check if the classifier performs its task | A positive phrase is given to detect the sentiment | Detected as positive |

# 7. CONCLUSION

# 7 .CONCLUSION AND FUTURE SCOPE

**CONCLUSION:**

The recent developments in AI and deep learning have prompted more government entities to adopt these technologies to improve their systems and services. These technologies face a wide range of barriers, including a shortage in specialists, computational resources and public trust, as well as the ability to understand AI. Once we had briefly discussed the current condition of e-government indexes around the world, we next presented our own solutions to help improve the current state of e-government by using the Gulf Countries as a case study After that, we went over what artificial intelligence (AI) and electronic government (e-government) meant. We've come up with a complete strategy for managing government information resources. Many government operations could benefit from the automation and facilitation provided by deep learning techniques. After then, a smart platform for the development and implementation of AI was made available. This paper's overarching purpose is to propose new frameworks and platforms for integrating AI methods into e-government systems and services.

**FUTURE SCOPE:**

It is hoped that the protocol for modifying policies rather than the method will be further studied and improved. There are numerous governments throughout the world that have adopted and defined this strategy in an effort to improve public trust in government, bolster democracy, and provide better government services.

# 8. BIBILOGRAPHY

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## 8.2 WEBSITES

**https://github.com/chandu20032000/Automating-Egovernment-Feedback-Services-with-Machine-Learning-And-Artificial-Intelligence**

# 9.PAPER PUBLICATION

JOURNAL OF EDUCATION: RABINDRA BHARATI UNIVERSITY
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# AUTOMATING E-GOVERNMENT FEEDBACK SERVICES WITH MACHINELEARNING AND ARTIFICIAL INTELLIGENCE

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**ABSTRACT**
Recently, AI has boosted the existing state of the art in a growing number of sectors. Some challenges exist that hinder its widespread implementation in e-government applications, both for the advancement of e-government systems and for people' interaction with government. E-government systems face various hurdles, and in this study, we present a framework that employs AI technology to automate and facilitate e-government services. For begin, we'll draw out a strategy for managing e-government data assets and information. This is followed by construction of a set of deep learning models targeted at automating numerous government services. On top of that, we've presented an electronic government platform architecture that makes it easy to build and implement AI functionalities. With the aim of reducing processing times, cutting costs, and enhancing citizen happiness, we're aiming to upgrade the current status of e-government services by adopting proven AI approaches.
**Key Words —** Artificial Intelligence,Machine Learning, Automation,Convolutional Neural Network, Sentiment Analysis.

## 1. INTRODUCTION

These days, artificial intelligence (AI) and machine learning (ML) are hot topics. Automated decision-making and less human contact are possible because to this technology. Health insurance policies can be characterized in this way: they are government policies that benefit the general public by enforcing a specific regulation. In this particular health insurance policy, the policy is contained within certain restrictions and their product. Automated Intelligence is a process that converts the entire systematic procedure into software and digitally assisted approach into an overall set of rules. A theoretically national operation is being set up by the government to handle all aspects of health insurance. Detection and analysis of varied user ideas and input, including the identification of negative and positive options, must be a foundation for the system. The AI method can be used to all sections of the sectional methods, and their attributed insurance policies can also be considered in this context.

## 2. LITERATURE SURVEY

[2] In, the advancement of the technologies not only MNC's but also governments also started to show interest into the technologies into the applications of the government-based websites, networking and also machine learning to learn from the about the how to solve problems to the common people. They, have validated the use of AI in the modern-day world and machine learning can and will be adapted into the governments. A model be introduced to take the AI into the account for the need of complementary organisational changes and creating impact. This, model takes account into the need and service of the public.[3] Based, on the good governance theory the practices of the government influence the people in the right way for which the technology is important. And, based on the public's trust the mechanism of perceived government response on COVID-19 (PGRC) is being implemented to collect and analyse the situation of the country or a particular place. Social media have been also actively participating in the

analysis and sharing of the information based on the government's orders for which the datais being implemented and analysed. This study tried to contribute to the body of knowledge whileaddressing the gap related to the dearth of literature regarding government use of ICT during the COVID-19 pandemic to harvest benefits from social media while communicating with citizens on a larger scale.[4]E-government is one of the major paradigms which plays an important role in the complete safety of the people and it emphasizes different means of the situation. The, things like standardization and departmentalization are a part of this system. Based on a content analysis of city Web sites and a survey of Web development officials, this article shows that many cities are already moving toward this new paradigm. The, one-stop shopping which is online shopping plays a major role for which the data is being used accordingly.[1] The statistical machine learning methods have a limited impact. Due, to rise in the sizes of the data available on the internet the processing powershave also started to rise subsequently. This, is because the statistical methods of machine learning is being completely focused on the time factor. Where,the size is also to be considered accordingly. For, this type of trade-offs the case is different for small-scale and large-scale problems. There, the different algorithms become a part in the part of the software along with different algorithms. The, optimization algorithms like stochastic gradient descent algorithms play a major role in the large-scale applications to improve the optimizations of the modern-day systems. [5] The, challenges faced by such systems is that to make machine learn different mathematics and algorithms for which the data is being used. Teaching and learning areone of the major issues in this model and machine learning pattern. Through presenting the method on understanding basic mathematics in this case study, descriptive analysiswas conducted in ensuring the entire process on the planned stage. The, teaching and learning can be madebetter by joyful learning process which is multimedia representation.Different, platforms people's interest representation can help the machine learning algorithm and also making people's learning interesting.

## 3. PROPOSED METHODOLOGY

In this study, the author discusses the idea of using Artificial Intelligence to automate government services, such as the Convolution Neural Networks Deep Learning algorithm (CNN). Introducing new initiatives on the internet provides a platform for the government to communicate with the public, who can subsequently read about them in the media and voice their opinions in the form of blog posts and other public commentary. Software like human brains is needed to identify public opinion about schemes automatically, and this software must be able to discern whether the opinions expressed are in favor of positive or negative. The author's suggestion is to construct a CNN model that works like a human brain in order to build such an automated opinion identification system. This CNN model can be produced for any service and made to work like automatic decision-making without any human involvement. We can generate this CNN model for any service. One model can detect or recognize human handwritten numbers, and another model may detect sentiment from text sentences that humans can provide concerning government plans, to suggest this strategy, the author has already described the concept of implementing several models. We've included a new model in our extension that can identify emotion in a person's face image. Expressions on a person's face can convey feelings far more effectively than words or sentences ever could. As a result, we have developed an extension to our work that can predict the emotional state of a person based on facial photos.

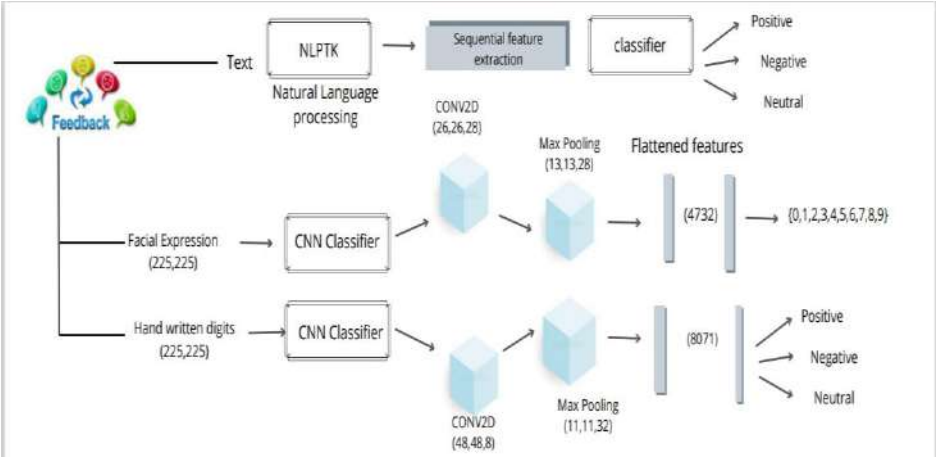


**Fig 3.1:** Project Functionality

**4.ELEMENTS REQUIRED**

It's common practice in software and systems engineering to refer to a "functional requirement" as the specification of a system's or component's function.

It's possible that a system's functional requirements will include computations, technical details, data manipulation and processing, as well as other unique functions.

Use cases are various ways in which the system's functional needs will be put to use. Additional limits on design or implementation are imposed by non-functional requirements (also known as "quality requirements") (such as performance requirements, security, or reliability). Non-functional requirements typically take the form of "system shall be," whereas functional requirements typically take the form of "system must do" (i.e., "system must perform a function"). Functional requirements are addressed in the system design, whereas non-functional requirements are addressed in the system architecture. Requirements engineers use the term "functional requirements" to describe the specific outputs that a system must deliver. A feature's non-functional requirements include aspects like cost and dependability that are not tied to a single feature. While the technical architecture of a system is driven by non-functional requirements, it's the application architecture that determines how it works. In some scenarios, requirements analysts will generate use cases after gathering and verifying a set of functional requirements. Functional needs are gathered and modified in the following order: Incorporation of user/stakeholder request analysis use cases. There is a requirement from stakeholders, which is examined by systems engineers through the creation of use cases. The requirement is then implemented or incorporated after proper documentation and approval. Each use case depicting a specific behavioral circumstance has a functional requirement. Analysts typically begin by gathering use cases, from which they can derive the functional requirements that must be implemented for each use case.

i. Gathering of data
ii.Preparation of Data
iii.Trainingand Testing
iv.Modiling
v.Predicting

Requirements that are non-functional:

The quality attribute of a software system is described by (NFR). For a software system to be successful, non-functional criteria such as responsiveness, usability, security and portability must be met. An example of a non-functional criterion is, "How fast does the website load? ", for example. Non-functional needs must be completed if users are to be satisfied.

Non-functional Requirements can be used to limit the design of the system, which can be applied to all agile backlogs. The site should load in three seconds or less when it has more than 10,000 concurrent users. Non-functional needs must also be described in detail.

## 4. RESULTS

The design of our system relies heavily on this layer. E-government automatic services and core functionality for the designated tiers are one of the most significant parts of this project.

The composition of this layer is broken down into four parts.

First, an abstract definition is used, followed by a citizen request, to identify what kind of service is required. It is possible to use intelligent agents and AI techniques to identify and configure strategy through intelligent agents.

When determining the best approach to meet user needs, evaluation and optimization are critical steps.

In the event of any discrepancies in the services, it is critical to revaluate and replan in order to ensure appropriate execution of the services at run time. A substantial amount of organized data and information will be generated by an open electronic government in order for the public sector to play a significant role in enhancing citizen services. Open citizen services, e-government marketplaces, smart products, and a better level of trust between the public and the government have been made possible by these new frameworks. Central oversight vs. initiative reports from various government departments should be supplied in detail. These and other organizations are selected because of their ties to and knowledge of the government. These organizations' leaders have a limited tenure because they are more concerned with policy than process. This strategy has been embraced and defined by a number of governments throughout the world in an effort to promote public trust in government, strengthen democracy, and improve government service quality.

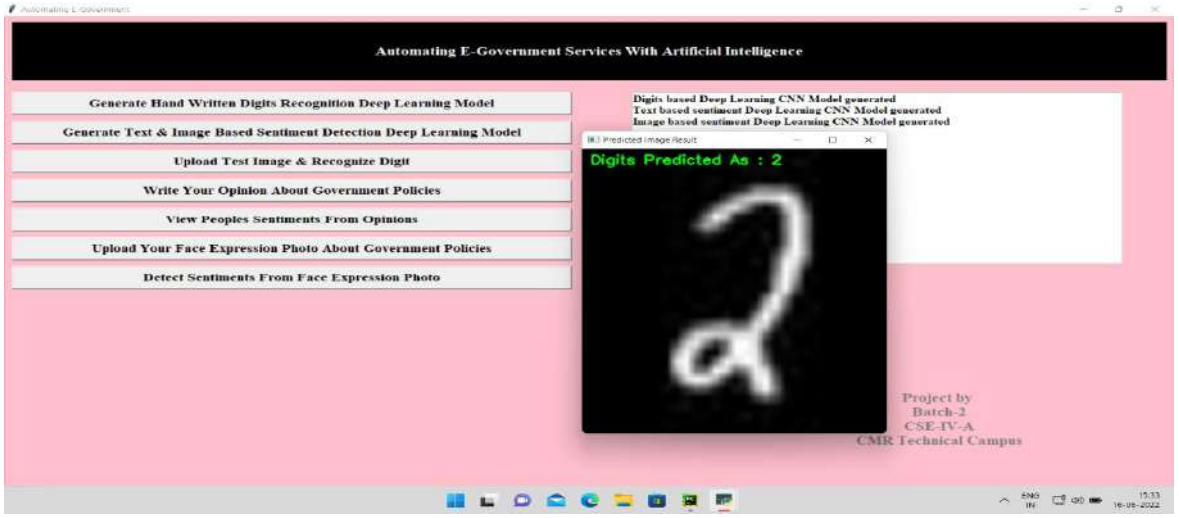


**Fig 5.1:** Screenshot Of digits recognition

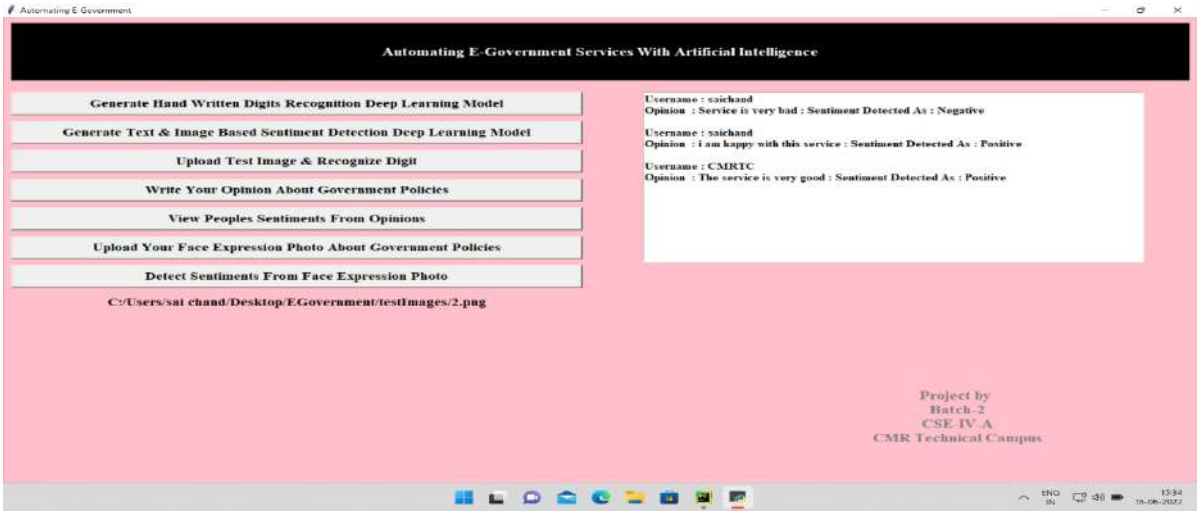


**Fig 5.2:** Screenshot Of classification of comments entered by the users

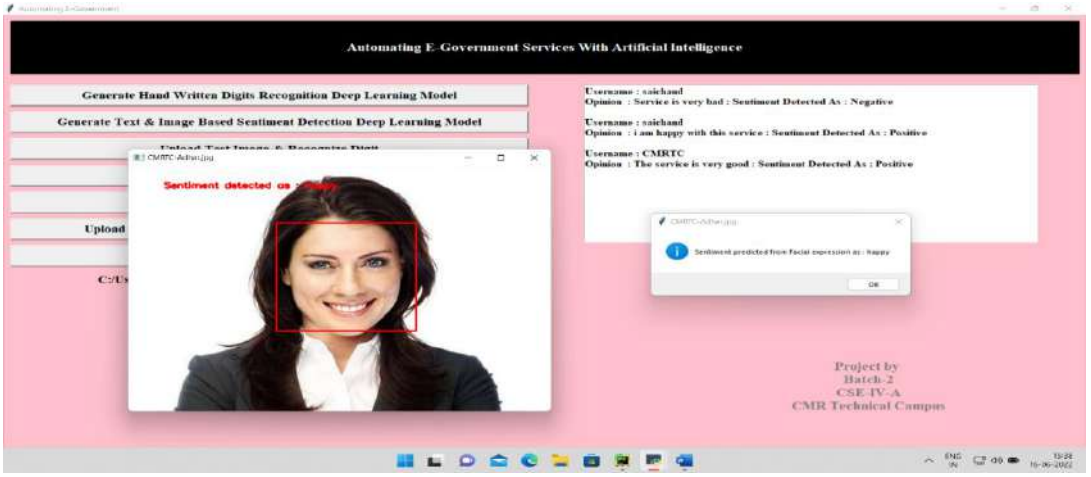


**Fig 5.3:** Screenshot of detection of facial expression given the user.

## 5. FUTURE SCOPE

It is hoped that the protocol for modifying policies rather than the method will be further studied and improved. There are numerous governments throughout the world that have adopted and defined this strategy in an effort to improve public trust in government, bolster democracy, and provide better government services.

## CONCLUSION

The recent developments in AI and deep learning have prompted more government entities to adopt these technologies to improve their systems and services. These technologies face a wide range of barriers, including a shortage in specialists, computational resources and public trust, as well as the ability to understand AI. Once we had briefly discussed the current condition of e-government indexes around the world, we next presented our own solutions to help improve the current state of e-government by using the Gulf Countries as a case study After that, we went over what artificial intelligence (AI) and electronic government (e-government) meant. We've come up with a complete strategy for managing government information resources. Many government operations could benefit from the automation and facilitation provided by deep learning techniques. After then, a smart platform for the development and implementation of AI was made available. This paper's overarching purpose is to propose new frameworks and platforms for integrating AI methods into e-government systems and services.

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[5] A research paper on Developing Multimedia Application Model for basic Mathematics

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*Authored By*

**Sai Chand Goud Gadagoni**
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