# IMAGE RECOGNITION AND CATEGORIZATION FOR VISUALLY CHALLENGED

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## 1.PROJECT DESCRIPTION

The project is a software useful for visually challenged people to recognize the objects around them.

## 2. PURPOSE OF PROJECT:

Identifying and categorizing the images for visually challenged to recognize the objects around them. The software also gives detailed information about the object like its color, shape, size etc. The input is taken as voice commands by the user and the output is conveyed by text to speech converter.

## 2a. GOAL OF PROJECT:

The main goal of this project is to recognize and categorize the objects that are in the images clicked from a mobile by a visually challenged person and communicate the same to visually challenge person through voice.

## 3. SCOPE OF THE WORK:

This project will include functionalities as per the requirements of visually challenged people such as blind, partially sighted, etc. , thus will be used by them as they are getting a software which will give output anywhere and anytime.

## 4. STAKEHOLDERS:

A stakeholder is anybody who can affect or is affected by an organization, strategy or project. Some definitions suggest that stakeholders are those who have the power to impact an organization or project in some way.

4a. Visually challenged people

- they will be the customers using this application for day to day life usage to recognize the objects around them.

4b. Administrator

- IT Staff and Maintenance Department - They are concerned with installing and maintenance of the application.

4c. Developer

- They are responsible for development of application well within budgetary and time constraints.

## 5. CONSTRAINTS:

Following are the constraints which are mandated before the project gets under way:

**Financial boundary:**

· This project requires Watson API calls which have a limit for free usage after which we need pay to make more API calls. Hence a financial support is required to have full scale working software.

**Time boundary:**

· Time is required to have in depth understanding of the technologies required.
· Time is required to decide features of the product with consent of all the members of the group.
· Short availability of time due to other ongoing activities.

**Knowledge boundary:**

· Implementing the neural network model of object recognition program.
· Inadequate knowledge of mobile app development.
· Implementation of text to speech and speech to text algorithms.

## 6. REQUIREMENTS:

6a. Functional Requirements:

The customer should be able to click an image and provide it as an input for image recognition module.

The image recognition module should be able to process the image and recognize and categorize the objects in the image and provide the results to text to speech module.

The customer should be able to output voice language in which the output is given to him.

6b. Non-Functional Requirements:

- Speed and Latency Requirements :

  The application must take less than 30 seconds to load or give response to any action by user in case of high workload.

- Capacity Requirements :

  The application capacity is limited by Amazon server calls which is 15000 requests per minute and it can be improved by using better plan.

- Reliability :

  The application's mean time between failures shall be at least 4 month.

- Availability:

The application shall be available to all the users 24*7 and Downtime within normal working hours shall not exceed five seconds in any one day.

### 7. TECHNOLOGIES USED:

The programming language which is used to the software is python. The python framework used is django for server hosting. The other libraries used are pyinput, selenium webdriver for automating chrome, JSON python library for handling JSON data and keyboard library for automatically pressing the keys on keyboard. The image recognition and categorization module is implemented using the Watson API. The text to speech module is implemented by ResponsiveJS API.

## 8. Approach:

An incremental approach for this software is required where the development of the image recognition tool has to be done first and tested. Then other input and output programs have to develop such as text to speech and speech to text. In the final stage a graphical user interface is required. Simultaneous testing of these procedures is also required. After testing a full beta model has to release to check for any bugs and enhance user experience by the reviews of people. After the release of the final product maintenance of it is required for fix any further issues.

## 9. Evaluation:

There shouldn’t be delay in the project development and all the requirements which were aimed earlier should be achieved. Based on the requirement specifications we will evaluate the cost so that it stays within the budget. Final deadline for the project needs to be evaluated and new requirements according to current needs have to be implemented efficiently and cost effectively.

## 10. REVIEWS:

The Final stakeholders will review the project and decide upon the further modifications to be made to the project. The unique selling points of the product will be highlighted to impress the stakeholders. The Further modifications and improvements to the software features and requirements will be carried out based on the reviews.

## 11. OPEN ISSUES AND SOLUTIONS:

So while handling such a project where stakeholders have bit conflicting and inter dependable demands: following issues are to be tackled:
**Problem 1:** Everybody wants to know what it's going to cost.
**Problem 2:** Requirements aren't clearly defined.
**Problem 3:** Requirements need to change for business reasons.

**Problem 4:** Requirements prevent changing to a more suitable solution.
**Problem 5:** Content management chat application is vulnerable to hacking.
**Problem 6:** Content management system can reach the end of life! :
**Problem 7:** It is tough task to actually test the scalability and reliability.

There are of course certain measures to be taken beforehand as calamities do not occur with permission! Some of the general solutions to the above mentioned problems are as follows:
**Solution 1:**
Agree to a budget up front.
**Solution 2, 3, 4:**
Always start the project with confined requirements and do anticipation beforehand to avoid the agony of making tedious changes to the software.
**Solution 5:**
Start from a preconfigured installation, on a platform that's easy to modify.
**Solution 6:**
Make sure the site is very well backed up, and security measures are upto date.
**Solution 7:**
Plan and budget for upgrades.
**Solution 8:**
We can use software which help us in testing our application.(e.g. Browser Stack). Pouring a bit extra money will save us on huge losses later.

## 12. RISKS:

Risk is future's **uncertain event** with a probability of **occurrence** and a **potential** for loss. When the risk actually happens, it becomes the 'issue'**.**

| Risk | Mitigations |
|---|---|
| Team member lack the required skills for application testing. | Plan training course to skill up your members |
| The project schedule is too tight; it's hard to complete this project on time | Set Test Priority for each of the test activity. |
| Test Manager has poor management skill | Plan leadership training for manager |
| A lack of cooperation negatively affects your team's productivity | Encourage each team member in his task, and inspire them to greater efforts. |

## 13. REFERENCES:


1. Bucky’s Tutorials
2. Tutorialspoint
3. https://responsivevoice.org/
4. https://www.ibm.com/watson/