

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	03 October 2022
Team ID	PNT2022TMID31779
Project Name	Digital naturalist AI enabled tool for biodiversity researchers
Maximum Marks	4 Marks

Functional Requirements:

Functional requirements of the proposed solution are mentioned below.

FR No.	Functional Requirements (Epic)	Sub Requirements (Story/ Sub Task)
FR-1	Capturing:	This tool aids naturalists in their study by enabling them to record live photographs for their studies.
FR-2	Classification:	It specifies the "class," or the category to which the image belongs. Remember that an image can only have one class.
FR-3	Tagging:	Additionally, tagging is a more accurate kind of classification. In addition to identifying the species that the researcher is likely to be familiar with, it also names a number of other items in the photograph that the naturalist took.
FR-4	Localization:	The property creates a bounding box around the object so that the object i.e., the species can be recognized within the image.
FR-5	Detection:	Detection extends the localization property by detecting and categorizing distinct objects in an image. It detects and draws a bounding box around all of the objects in an image, allowing the researcher to comprehend and investigate more objects (species).
FR-6	Semantic Segmentation:	Segmentation makes it easier to pinpoint an element on an image to the nearest pixel.
FR-7	Instance Segmentation:	Instance segmentation aids in distinguishing between multiple objects of the same class.
FR-8	Storage:	It keeps track of all the information gathered during the capture and can be utilized for

		statistical purposes. Additionally, if a new species is discovered, it can be saved and used to train the model to recognize the species in the future.
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Non-Functional Requirements:

Non-Functional requirements of the proposed solution are mentioned below.

NFR No.	Non-Functional Requirements	Description
NFR-1	Usability	This tool confirms that usability is a unique and important perspective for analyzing user requirements, which can help to improve tool quality even further. The analysis of users' usability in the model process with user experience as the core can indeed help designers better understanding of users' potential needs, behaviour, and experience.
NFR-2	Reliability	Deep learning is used to train the model, which increases tool efficiency and reliability for picture identification.
NFR-3	Accuracy	Image capturing should be accurate so that the image is recognized and the objects in the images are categorized and tagged. The degree of accuracy in image capturing determines the accuracy of the object (species) recognition.
NFR-4	Performance	Image filtering, segmentation, feature extraction, and rule-based classification are the steps involved in the traditional computer vision method to image recognition. A neural network algorithm receives the photos from the generated dataset as input. This is the part of building an image recognition model that uses deep learning or machine learning. Convolutional neural networks image recognition may recognize particular classes due to training of an image recognition algorithm.
NFR-5	Availability	By creating and implementing this robust technology, we assist naturalists who require a digital tool to identify species in order to further their research.
NFR-6	Scalability	Data can be added or modified based on the future needs. Multiple data can be viewed at the same time.