

MEDICINAL PLANTS IDENTIFICATION WITH ENHANCED AUTHENTICITY BY IMAGE PROCESSING USING DEEP LEARNING TECHNIQUES AND SUPPLY CHAIN INTEGRITY

MENTOR

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ABSTRACT

The Proposed System utilizes **Convolutional Neural network(CNN)** image processing algorithm and accurately identify the medicinal plants based on their visual characteristics with enhanced **authentication** and implementing the **supply chain integrity** for the identified Medicinal plants to enhance common people identification and awareness.

Keywords:CNN,Supply chain Integrity,Image processing,authentication.

INTRODUCTION

The proposed system employs **deep learning** techniques to accurately identify medicinal plants through advanced image processing. By integrating these identification capabilities with comprehensive **supply chain integrity** measures, the initiative aims to ensure the authenticity and traceability of medicinal plant products, enhancing their **reliability** and safety from harvest to consumer.

LITERATURE REVIEW

S.NO	TITLE	AUTHORS	JOURNAL	YEAR	CONTRIBUTION	LIMITATION
1.	A Study of CNN and Its Impact on Global Communication	I.Volkmer	IEEE	2022	Contributed on the impacts of CNN algorithm efficiency	It doesn't specifies the edge cases in CNN
2.	Software Supply Chain Security	C. Crossley	IEEE	2024	Gave crisp Idea on the supply chain technique.	Security content is less covered

LITERATURE REVIEW

S.NO	TITLE	AUTHORS	JOURNAL	YEAR	CONTRIBUTION	LIMITATION
3.	Blockchain-based Medical Image Encryption Using Arnold's Cat Map in a Cloud Environment	S. Inam, S. Kanwal, R. Firdous	IEEE	2024	Contributed on the effective techniques in blockchain security	It doesn't specifies the Advanced encryption factors
4.	Herbal Leaves Classification Based on Leaf Image Using CNN Architecture Model VGG16	Oktaviana, Wicakson	IEEE	2023	VGG16 is deeply explained in this paper	Much more Insights on the CNN is expected

LITERATURE REVIEW

S.NO	TITLE	AUTHORS	JOURNAL	YEAR	CONTRIBUTION	LIMITATION
5.	Comparison of Data Preprocessing Approaches for Applying Deep Learning to Human Activity Recognition in the Context of Industry 4.0	X. Zheng, M. Wang	IEEE	2020	Contributed on the Data preprocessing techniques explanation	It doesn't cover the edge cases in Dataset processing
6.	Classification of Medicinal Plants Leaves Using Deep Learning Technique	H. Chanyal, R.K. Yadav	IEEE	2022	Deep learning technique is discussed deeply in paper	Doesn't specify the need of upgraded algorithms

LITERATURE REVIEW

S.NO	TITLE	AUTHORS	JOURNAL	YEAR	CONTRIBUTION	LIMITATION
7.	A Five-Layer Deep Convolutional Neural Network with Stochastic Pooling for Chest CT-based COVID-19 Diagnosis	YD Zhang, SC Satapathy, S Liu	IEEE	2022	Gave deep insights on the Five layer CNN techniques	It doesn't cover the edge cases in VGG16 model
8.	Authenticity and Authentication of Heritage:A Review	D. Chhabra	IEEE	2021	Authentication technique is discussed deeply in paper	Doesn't specify the need of Encryption algorithms

LITERATURE REVIEW

S.NO	TITLE	AUTHORS	JOURNAL	YEAR	CONTRIBUTION	LIMITATION
9.	A Survey on Different Methods for Medicinal Plants Identification and Classification System	Maibam Maikel Singh, Thounaoja Rupachan Singh	IEEE	2021	Explained with real time examples on classification	Survey has less authenticity compared to existing model.
10.	Blockchain Integration for Medicinal Plant Supply Chain Integrity	P. Zhao ,T. Clark	IEEE	2022	Deep Insights on the Blockchain Technology	Lacks in Integration part of Supply chain.

EXISTING SYSTEM

The existing system uses deep learning algorithms, the system employs image processing techniques to accurately identify medicinal plants, ensuring authenticity with accuracy of **96.12%** but the dataset used to train contains only **10 classes** of medicinal plants. By analyzing intricate features of plant images, the system can distinguish between different species with average precision, reduces the risks associated with **misidentification**. There is **no verification** and **authentication** of the medicinal plants products.

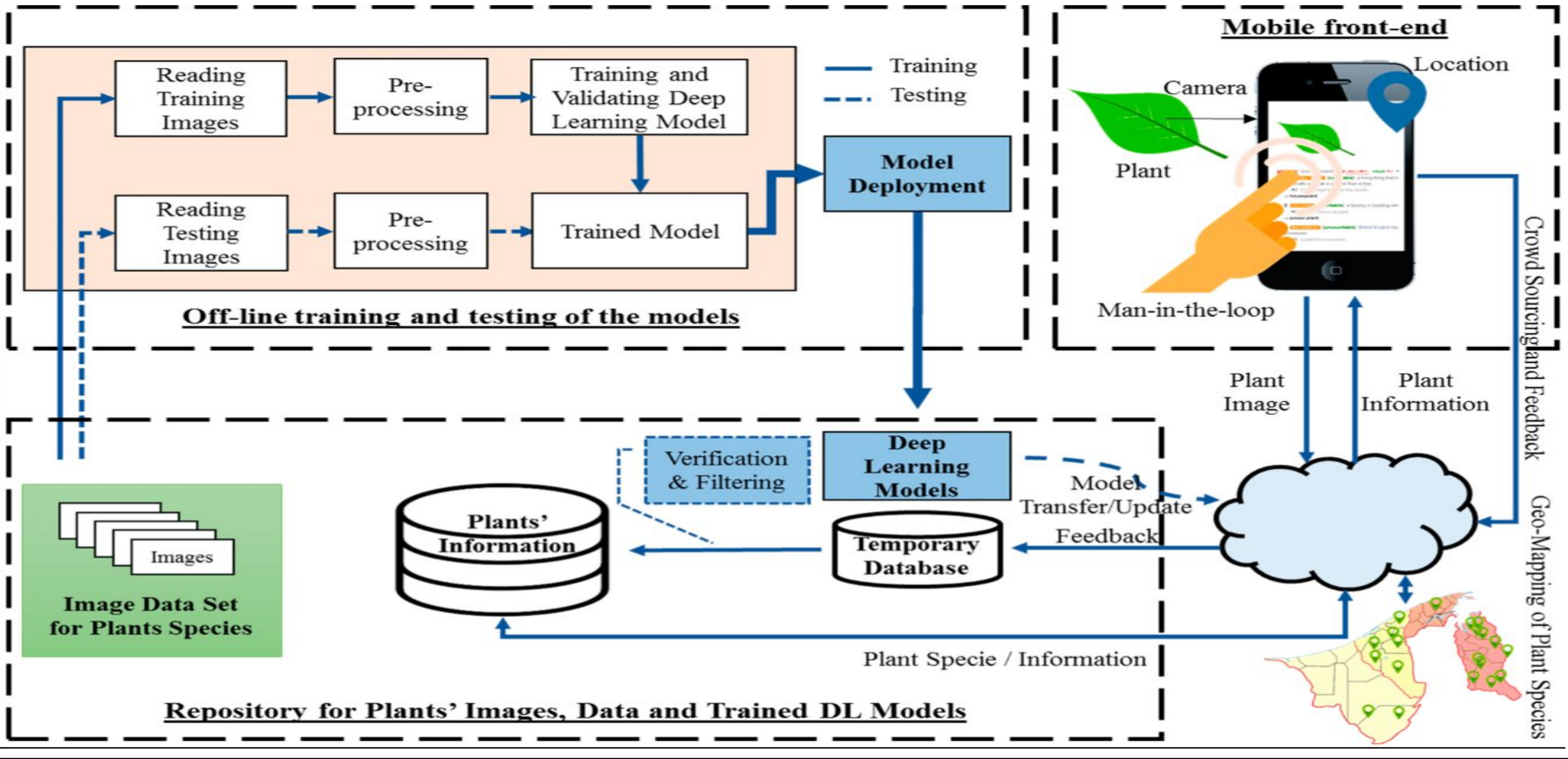
RESEARCH GAP

- The existing system uses deep learning algorithms, the system employs image processing techniques to accurately identify medicinal plants, ensuring authenticity with accuracy of **96.12%** .
- The dataset used to train contains only **10 classes** of medicinal plants. The system can distinguish between different species with precision, increases the risks associated with **misidentification** to training with less dataset.
- There is **no verification** and **authentication** of the medicinal plants products .

PROPOSED SYSTEM

The Proposed system uses cutting-edge deep learning algorithms, the system employs image processing techniques to accurately identify medicinal plants, ensuring authenticity by using dataset of **more than 100 classes** of medicinal plants with the accuracy of **97.97%**. The integration of supply chain integrity mechanisms ensures **transparency and traceability** of products. The system not only safeguards the **integrity of medicinal plant products** but also fosters **trust among consumers** and promotes sustainable practices within the industry.

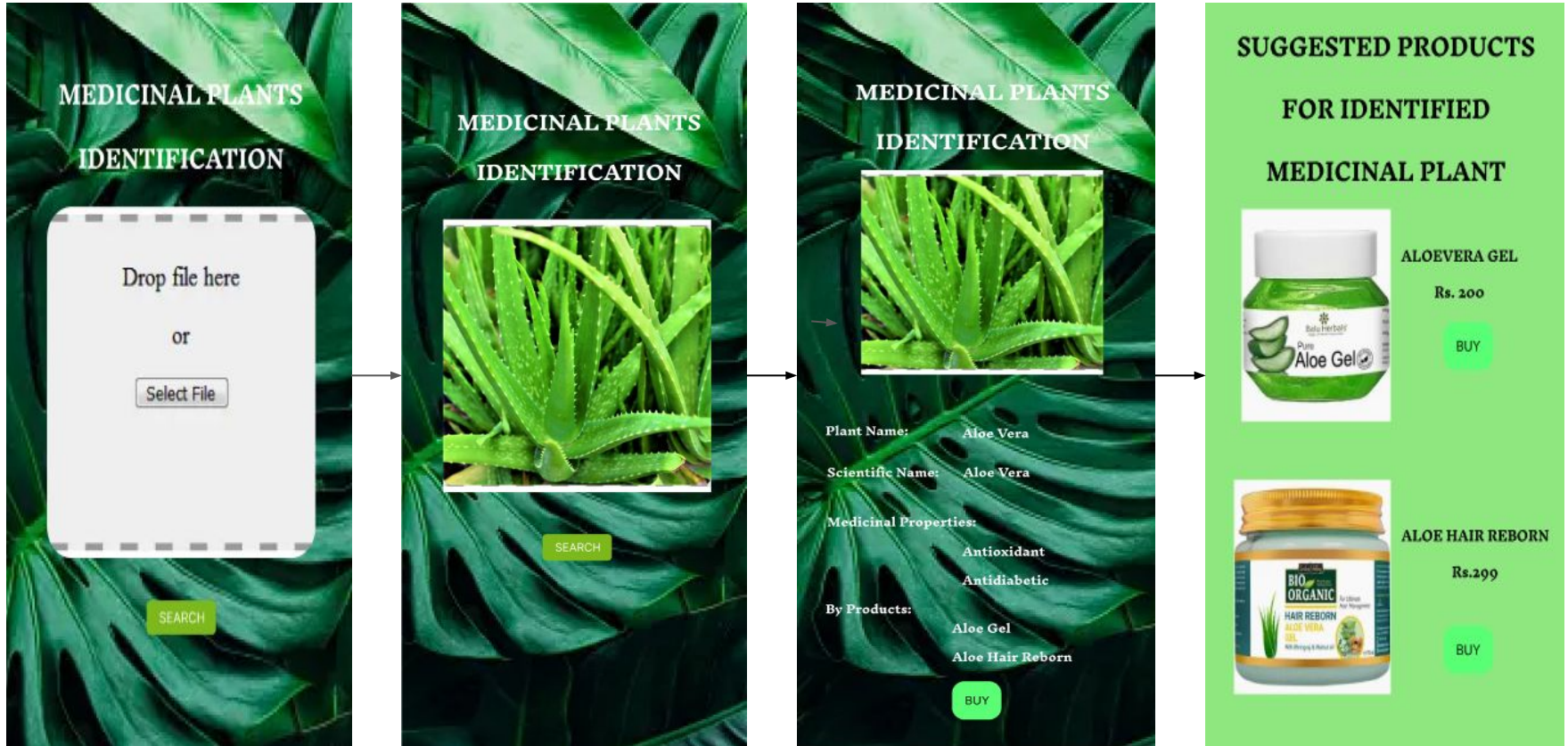
SYSTEM ARCHITECTURE



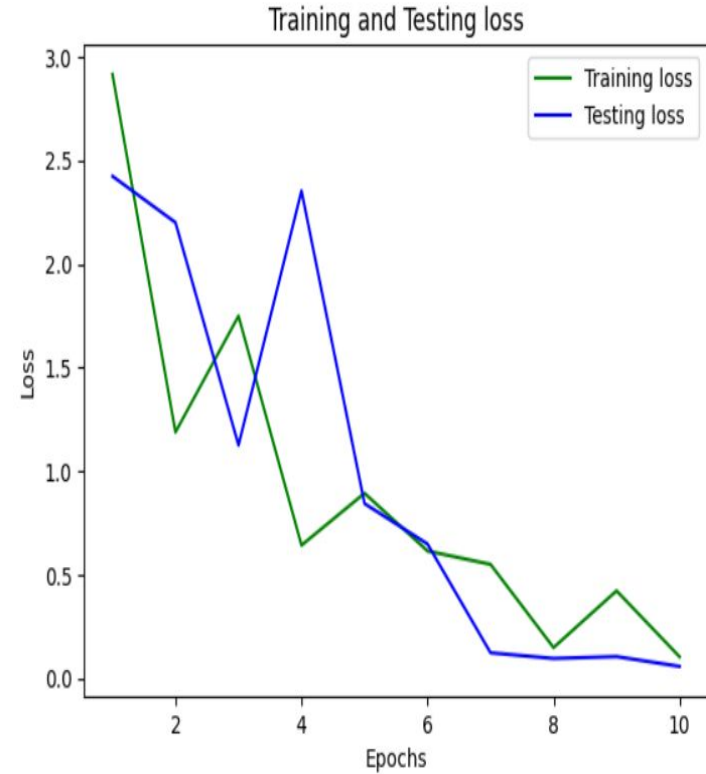
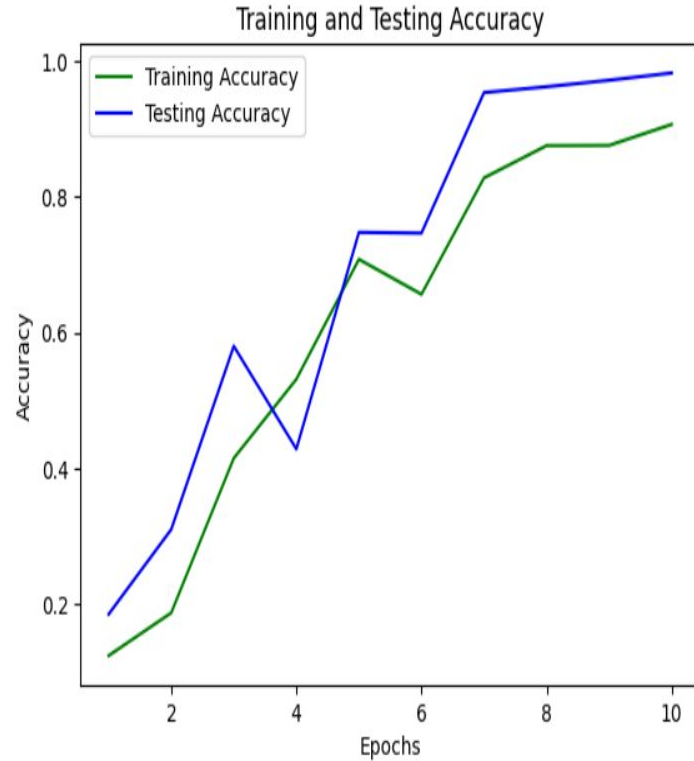
RESULTS AND DISCUSSION

The implementation of a Medicinal Plants Identification by Image Processing Using Deep Learning Techniques and Implementing Supply Chain Integrity utilizing **CNN Algorithm** represents a remarkable result by achieving **97.97%** accuracy in identifying medicinal plants, whereas existing system gives only **96.12%**. By delivering dependable and efficient quality assurance and traceability solutions, the proposed model helps to promote consumer health, encourage sustainable herbal medical practices, and reduce fraudulent activity in the herbal supply chain.

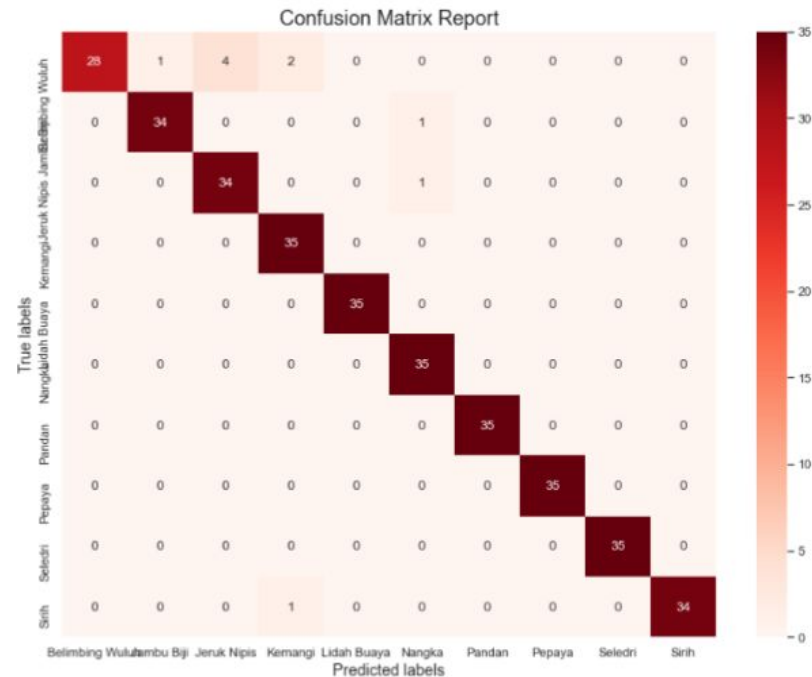
IMPLEMENTATION PROTOTYPE



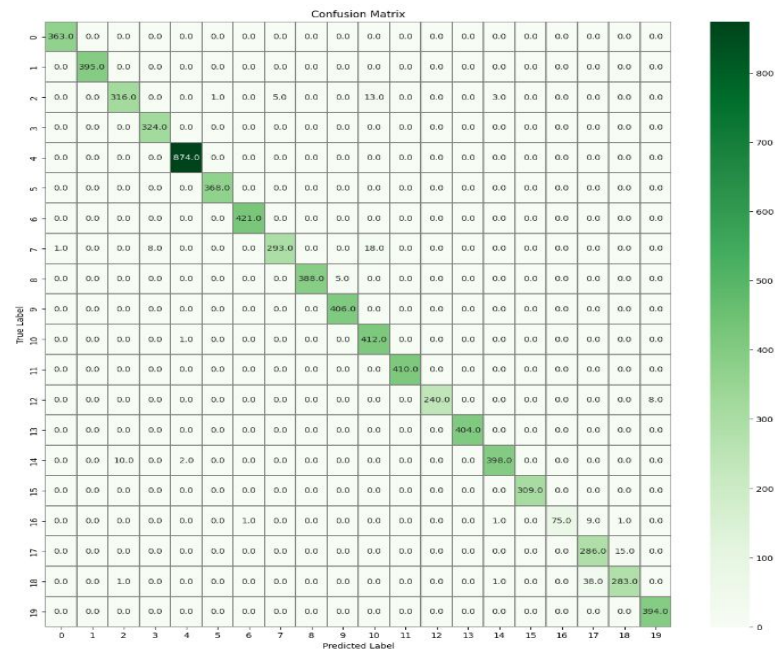
TRAINING AND TESTING GRAPHS



COMPARATIVE ANALYSIS

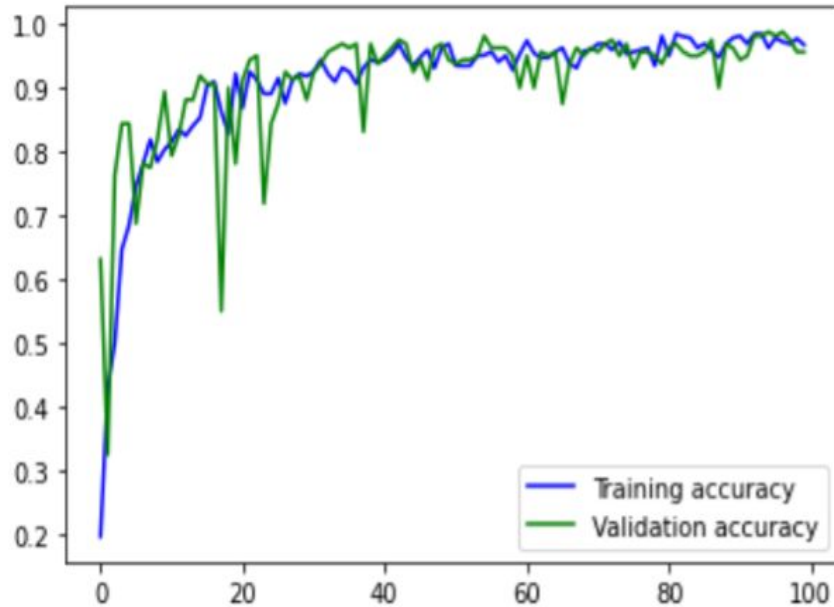


EXISTING SYSTEM

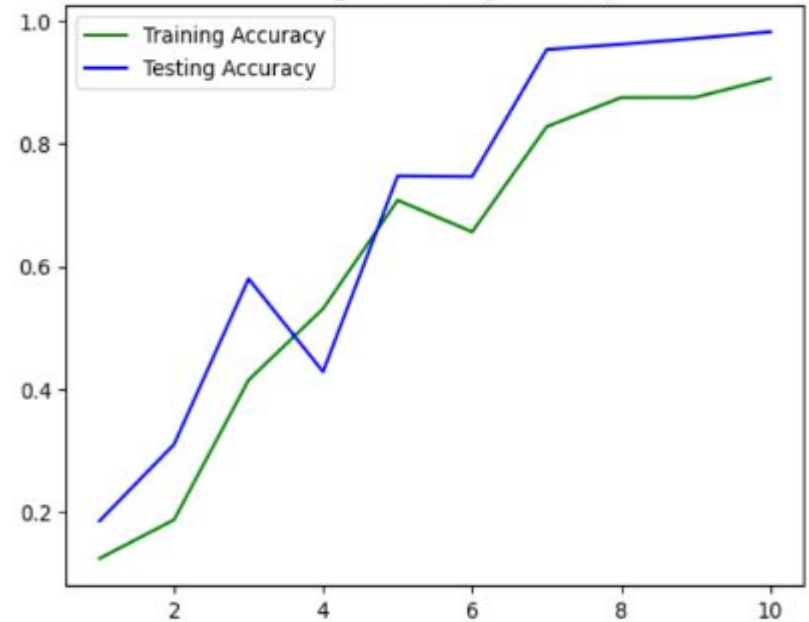


PROPOSED SYSTEM

COMPARATIVE ANALYSIS

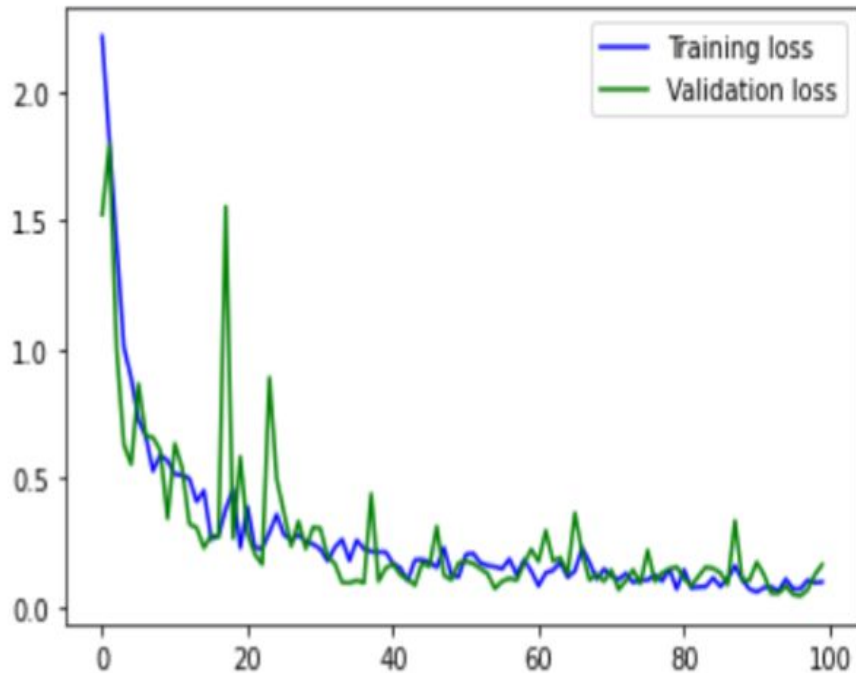


EXISTING SYSTEM

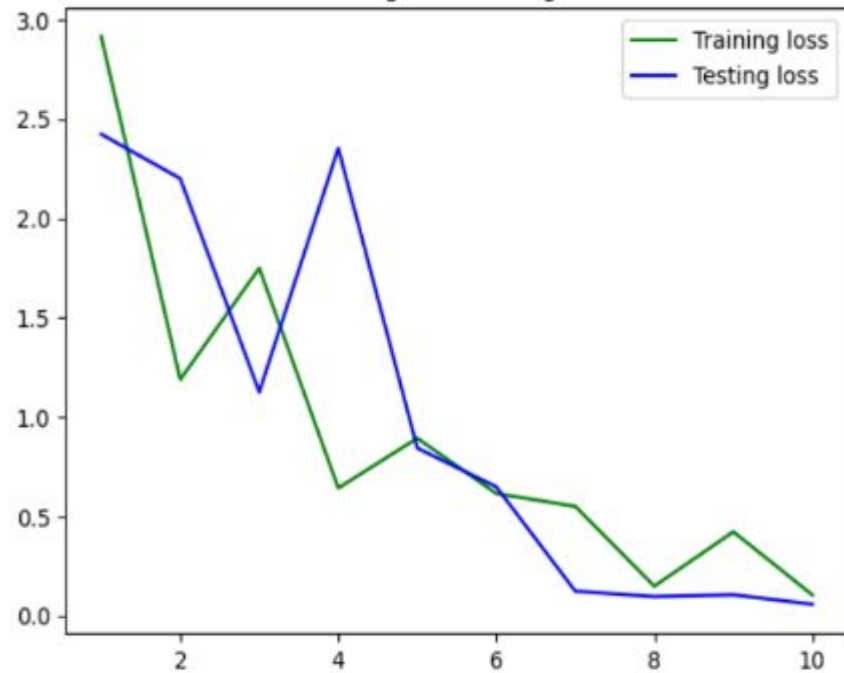


PROPOSED SYSTEM

COMPARATIVE ANALYSIS



EXISTING SYSTEM



PROPOSED SYSTEM

COMPARATIVE ANALYSIS

MODEL	ACCURACY
MEDICINAL PLANTS CNN [10 CLASSES]	96.12
MEDICINAL PLANTS CNN [20 CLASSES]	97.97

CONCLUSION

The proposed model is an important step forward in the fields of herbal medicine and supply chain management. The proposed idea effectively addressed significant difficulties in medicinal plant identification, **authenticity** verification, and **supply chain transparency** by combining cutting-edge technologies such as image processing, deep learning, and supply chain. The proposed approach has exhibited extraordinary accuracy, reaching a **97.97%** identification rate for medicinal plants using visual characteristics retrieved from photos. Greatly paves the way for **pharmaceutical industry** and **Global Marketing**.

FUTURE ENHANCEMENTS

- **Integration of IoT Devices**

Integrating IoT devices in the supply chain as future enhancement paves the way to monitor and record **environmental** conditions during plants surplus conditions as stocks and transportation for Supply Chain mechanisms.

- **Crowdsourced Verification**

Enhancing a platform for crowdsourced verification where users can contribute to **verifying** the **correctness** of plant identifications, which leads to better understanding of the identification.

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THANK YOU!