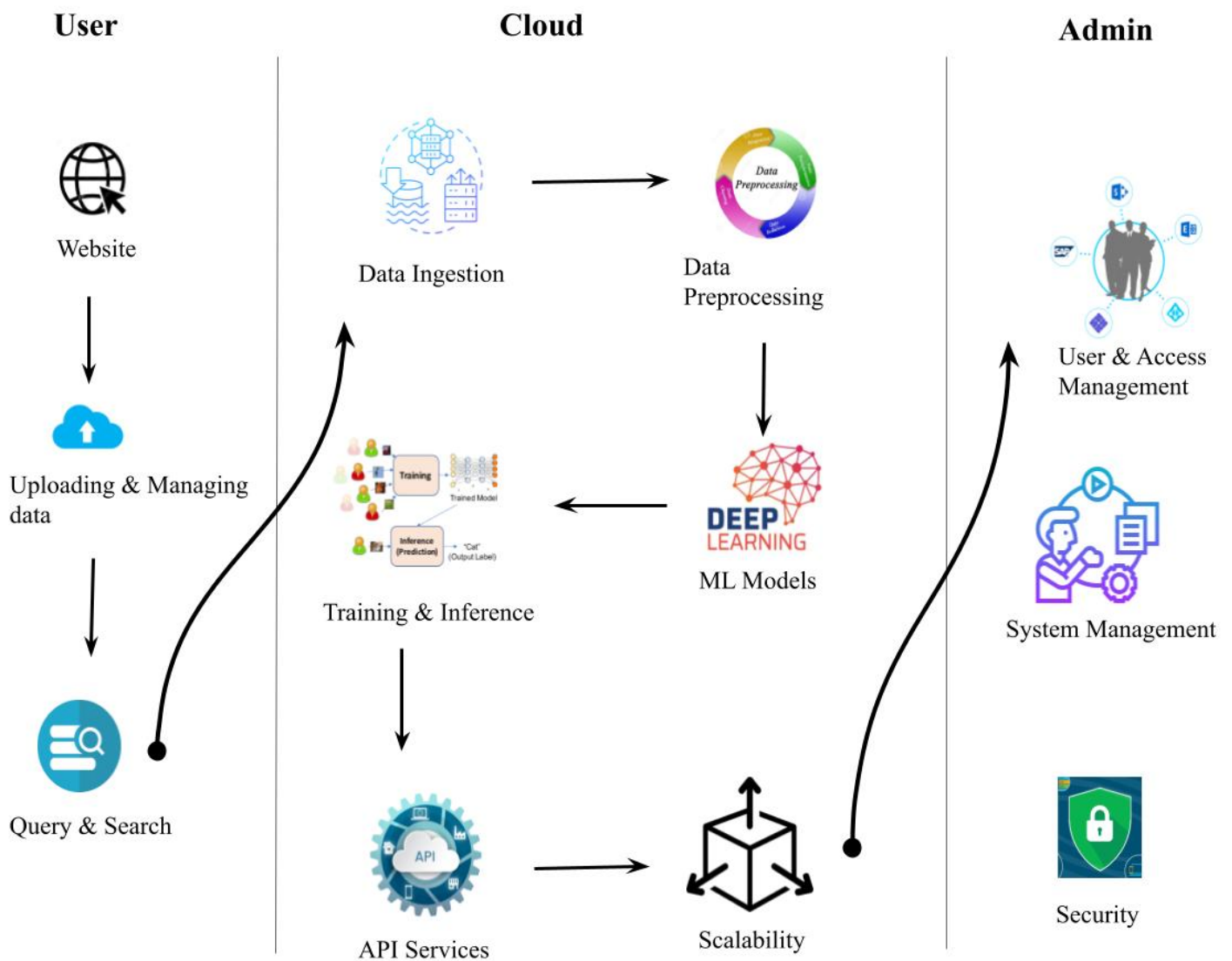


## Project Design Phase-II Technology Stack (Architecture & Stack)

Date	27 October 2023
Team ID	592787
Project Name	Crime Vision: Advanced Crime Classification With Deep Learning
Maximum Marks	4 Marks

### Technical Architecture:



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

S.No	Component	Description	Technology
1	User Interface	Interface for user interaction	Web-based interface, mobile app
2	User Authentication and Access Control	Control user access and permissions	OAuth, JWT, Role-based access control
3	Data Ingestion	Collect and store crime data from various sources	ETL processes, Data pipelines
4	Data Preprocessing	Prepare data for machine learning	Data cleaning, feature extraction
5	Deep Learning Models	Implement models for crime classification	Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Transformers
6	Training and Inference	Train models on historical data and perform real-time inference	TensorFlow, PyTorch, CUDA for GPU acceleration
7	APIs and Middleware	Expose APIs for user interaction and system communication	RESTful APIs, GraphQL, gRPC
8	Scalability	Handle varying workloads efficiently	Auto-scaling, Container orchestration (e.g., Kubernetes)
9	Distributed Storage	Store and manage large datasets	Amazon S3, Google Cloud Storage, Hadoop HDFS
10	Load Balancers	Distribute tasks efficiently	NGINX, HAProxy, Cloud load balancing services
11	Configuration Management	Allow administrators to configure the system	Configuration files, Web-based admin panel
12	System Health Monitoring	Continuously monitor the system's health	Prometheus, Grafana, ELK Stack
13	Alerting and Notifications	Send alerts to administrators in case of issues	Email notifications, SMS, Push notifications
14	Data Security	Ensure data security with encryption	TLS/SSL, Encryption algorithms
15	Model Security	Protect deep learning models from tampering	Model version control, Access control
16	Regular Software Updates	Keep the system up to date with security patches and bug fixes	Automated updates and patch management

**Table-2: Application Characteristics:**

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	Utilizes open-source frameworks for flexibility and community support	TensorFlow, PyTorch, Scikit-learn
2	Security Implementations	Implements robust security measures to protect data and models	Encryption, Secure APIs, Access Control
3	Scalable Architecture	Utilizes a scalable architecture to handle growing datasets and workloads	Cloud Services (e.g., AWS, Azure, Google Cloud), Container Orchestration (e.g., Kubernetes)
4	Availability	Ensures high availability for continuous service availability	Load Balancers, Redundancy, Failover mechanisms
5	Performance	Optimizes system performance for real-time inference and data processing	GPU Acceleration, Distributed Computing, Performance Tuning

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