

# MetaTrace: Web-Based Metadata Forensics Tool

## Progress Presentation

WE Group 12

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# Problem Statement

- **Importance of Metadata:**

- Critical for verifying file authenticity, ensuring data integrity, and supporting investigations.
- Offers insights into file origins, modifications, and hidden data.

- **Challenges with Existing Tools:**

- Advanced tools like ExifTool require deep technical expertise.
- Lack integrated visualization and intuitive, predictive analytics.
- Limited accessibility for non-technical users, hindering broader adoption.

## MetaTrace: A Comprehensive Metadata Analysis Platform

- **User-Friendly Interface:** A web-based tool that simplifies metadata extraction, visualization, and analysis.
- **Broad File Format Support:** Extracts metadata from images, documents, multimedia files, and more.
- **Advanced Analytics:** Predictive insights and anomaly detection.
- **Empowering Users:** Makes metadata accessible for both technical experts and non-technical users to verify authenticity, trace leaks, and investigate cybercrimes.

# Key Features

- ① **File Upload:** Supports images, PDFs, and documents.
- ② **Metadata Extraction:** Uses ExifTool for detailed metadata analysis.
- ③ **Predictive Insights:** Detect anomalies in metadata.
- ④ **Searchable Storage:** Fast and scalable metadata search.

## Technology Stack:

- **Frontend:** Next.js, Tailwind CSS
- **Backend:** Python with FastAPI and ExifTool integration.
- **Database:** MongoDB

# Current Progress

- **Completed:**

- File validations
- Frontend using Nextjs and Tailwind CSS
- Backend using FastAPI
- Metadata extraction functionality
- Database setup using MongoDB

- **Ongoing:**

- Exploring deeper metadata extraction
- JWT authentication for login
- Investigating anomaly detection possibilities

- **Next Steps:** Integration and optimization

- **Completed:**

- Week 1, Dec 2024 – Research & approval
- Week 2, Dec 2024 – Project planning & task allocation
- Week 3, Dec 2024 – Secondary approval
- Week 4, Dec 2024 – UX design & ExifTool documentation
- Weeks 1–3, Jan 2025 – Frontend & backend development
- Week 4, Jan 2025 – Metadata extraction; integration failed

- **Upcoming:**

- Week 5, 2nd week of Feb, 2025: JWT Authentication for login
- Week 6, 3rd week of Feb, 2025: Integration & Testing
- Week 7, 4th week of Feb, 2025: Optimization

**Demo!**



# Challenges and Learnings

- **Challenges:**

- Metadata variations across file formats
- Ensuring accurate extraction
- Balancing speed and performance

- **Learnings:**

- FastAPI is efficient for handling metadata extraction
- Tailwind CSS simplifies frontend development
- Need for thorough testing before integration

# Thank you

**Thank you for your time and consideration!**

*WE Group 12*