Only Creators: AI Driven Content Analyzer

Project Proposal

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Contents

Brief Details About Project

<table>
<tr><td>Project Name</td><td colspan="3">Only Creators: AI Driven Content Analyzer</td></tr>
<tr><td>Date of Commencement</td><td colspan="3">January 6, 2026</td></tr>
<tr><td>Expected date of Completion</td><td colspan="3">July 2026</td></tr>
<tr><td rowspan="5">Group members name with CGPA (till 6th semester and registration number)</td><td>Name</td><td>Registration No.</td><td>C.G.P.A</td></tr>
<tr><td>Ayaz Ahmed Waheed</td><td>FA22-BSE-037</td><td>3.10</td></tr>
<tr><td>Ahmed Zafar</td><td>FA22-BSE-002</td><td>3.05</td></tr>
<tr><td>Shoaib Ali</td><td>FA22-BSE-021</td><td>3.15</td></tr>
<tr><td>Average CGPA of Group</td><td colspan="2">3.1</td></tr>
<tr><td>Implementation Tool</td><td colspan="3">• Web Based
• VS Code
• Anaconda
• Github</td></tr>
<tr><td>Graphics Development Tools</td><td colspan="3">• Figma</td></tr>
<tr><td>Documentation Tools</td><td colspan="3">• Microsoft Word</td></tr>
<tr><td>Name of Platform for Implementation</td><td colspan="3">• Vercel</td></tr>
<tr><td>Proposed Supervisor Name (From SED)</td><td colspan="3">Dr. Nouman Ali</td></tr>
<tr><td>Proposed Co-Supervisor Name (From SED)</td><td colspan="3">Engr. Saman Fatima</td></tr>
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1. Project Summary/Introduction

Content producers find it increasingly difficult in today's digital era to know if their work is effective, let alone keep track of the data on changing online trends [3]. More often than not, creators struggle to have one place where they can monitor all their engagement, trending topics, and create better content strategies across multiple platforms like YouTube, Instagram, and TikTok [5]. The Only Creators for Content Creators solves this problem by providing an AI-driven web platform that collects data and analyzes it from social media [1][4]. By using machine learning and natural language processing, it evaluates the performance of the content, detects trends, and provides actionable insights via a user-friendly dashboard. It helps creators to understand audience behavior, keep track of trending items, and make data-driven decisions to increase engagement. By automating the analysis and detection of trends, it saves time, increases efficiency, and supports creators in remaining competitive within the digital space [6][7].

2. Problem Statement

Content creators lack a **unified platform** to monitor engagement and trends across YouTube, Instagram, and TikTok. Manual analysis of performance data is **time-consuming** and inefficient. Creators struggle to identify emerging trends quickly enough to remain competitive in the digital space.

3. Proposed Goals/Objectives

- **Main Goal:**

The main idea of this project is to design and develop an AI-based web application to support content creators in analyzing their performance and spotting emerging trends on different social media platforms.

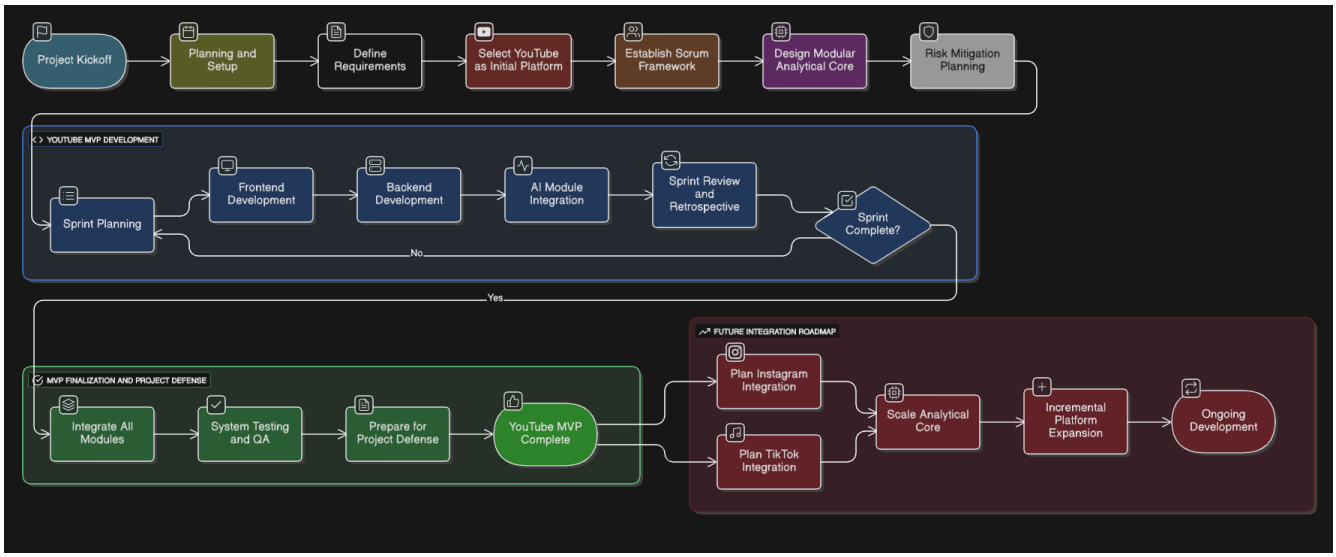
- **Specific Objectives:**

1. **Content Analysis:** To analyze the content and engagement metrics of creators with machine learning techniques to assess performance and audience response [8].
2. **Trend Detection:** Identify trending topics, hashtags, and content patterns using data from a variety of social media platforms [2].
3. **Insight Generation:** This will help create meaningful insights and visual reports, which help creators understand their content effectiveness [1].
4. **Personalized Recommendations:** To offer AI-based recommendations on enhancement of content quality, posting time, and engagement strategy [3][6].

5. **Cross-Platform Integration:** To integrate APIs from major platforms like YouTube, Instagram, and TikTok for unified data analysis [4].
6. **User-Friendly Dashboard:** To design an interactive dashboard showing key performance indicators and trends in real time.
7. **Automation and Alerts:** To implement automated email or notification alerts for significant performance changes or trending opportunities.

4. Implementation Method

- **Methodology: Agile Incremental Model**
  The project follows an iterative approach to ensure flexibility and continuous refinement over the 16-week development cycle.



- **YouTube-First Prioritization**
  Initial development focuses on YouTube, which represents the largest segment of the tracked creator economy with 87 million users.
- **Scrum Framework**
  Development is partitioned into two-week sprints to manage specific milestones for frontend, backend, and AI module integration.
- **Modular Analytical Core**
  A Python-based engine is developed to handle unstructured data, designed to be scaled for Instagram and TikTok in future increments.
- **Risk Mitigation**
  Focusing on a single platform initially reduces technical risks related to the range of conflicting requirements across multiple social APIs.
- **Functional MVP Delivery**
  This methodology ensures a fully functional web dashboard for YouTube is completed by Week 15 for the final project defense.

- **Future Integration Roadmap**
  Subsequent social platforms are treated as planned increments, utilizing the established architecture to expand the system's scope.

5. System Architecture

1. **Frontend Development:** The user interface will be developed in React.js to provide a responsive and interactive dashboard that will be able to display performance analytics, trends, and AI-generated insights in a visually appealing and easy-to-navigate manner.
2. **Backend Development:** The backend will be built with Node.js and Express.js and will handle API requests, data processing, and all server-side logic. It will securely connect the frontend to the database and machine learning modules.
3. **Database management:** The project will utilize a MongoDB database for storing user information, content statistics, and analysis results. It is flexible and scales well to accommodate large volumes of unstructured social media data [4].
4. **Machine Learning Integration:** Python will be used for the development of machine learning models focused on analyzing content performance, detecting trending topics, and generating recommendations. Data analysis and natural language processing tasks will be supported by libraries such as scikit-learn [2][8].
5. **API Integration:** Social media data will be gathered using YouTube, Instagram, and TikTok APIs, which will enable cross-platform content and trend analysis [4].
6. **Notification System:** A notification and alert system will be developed using tools such as Nodemailer or Resend, in order to notify the users about major content performance updates or emerging trends.
7. **Testing and Deployment:** The system will undergo thorough testing, including unit, integration, and user acceptance testing, before being deployed on a hosting platform like Vercel or AWS for public access.

6. Benefits

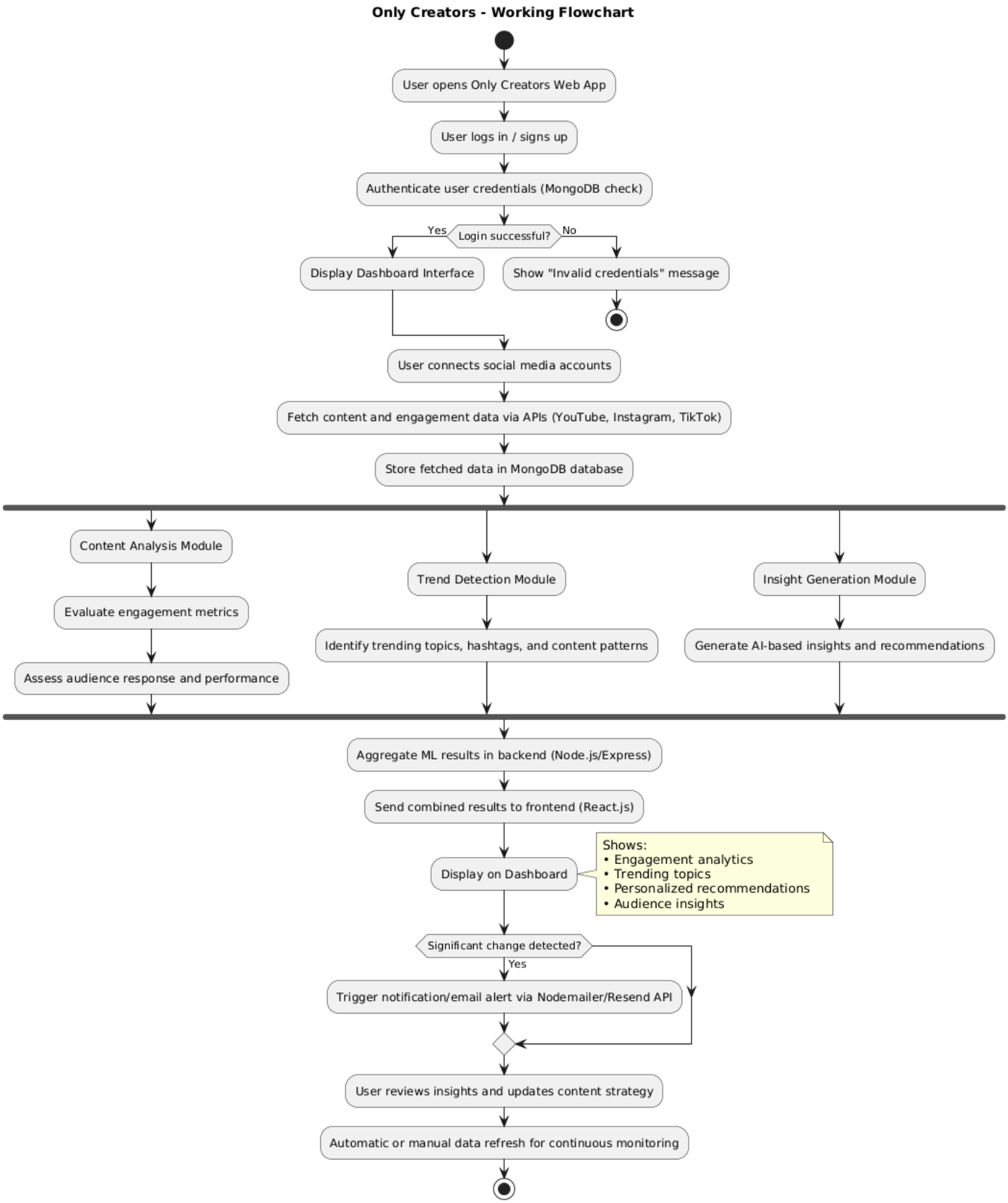
1. **Data-Driven Decision Making:** Helps creators in making informed decisions using analytics-based insights and performance evaluations [6].
2. **Time Efficiency:** Automates the detection of trends and analysis of content to reduce manual effort in tracking engagement across platforms [1].

3. **Enhanced Content Strategy:** Provides personalized recommendations to optimize content quality, posting schedules, and audience engagement [3].
4. **Cross-Platform Analysis:** Combines data from several social media platforms into one unified dashboard for better comparison and control [4].
5. **Deepening Audience Insight:** Provides deep insights on audience behaviors, preferences, and patterns of interaction that inform content development for the future [7].
6. **Real-time Alerts:** Notifies creators of sudden performance changes or trending opportunities for timely action.
7. **Competitive Advantage:** Enables creators to stay ahead of competition by identifying and adapting to new trends faster [7][8].

7. Technical Details of Final Deliverable

1. **Web Application Platform:** A live, interactive web-based dashboard will be accessible via any modern browser. Users can log in, connect their social media accounts, and see their performance analytics.
2. **Centralized Data Hub:** The system will aggregate and store data from connected platforms: YouTube, Instagram, and TikTok, into a secure MongoDB database, enabling unified analysis [4].
3. **AI-Powered Analytics Engine:** Python-developed machine learning models will analyze engagement metrics, find content patterns, and identify trending topics relevant to the niche of each creator [1][8].
4. **Interactive Dashboard:** The React.js-based frontend interface will feature insight displays through charts, graphs, and visual indicators for audience growth, engagement rate, and trend forecasts [6].
5. **Automated Recommendations:** The system will use the analytical output to provide personalized recommendations for improving content quality, timing, and platform strategy [3][6].
6. **Notification and Alert System:** The deliverable will include an automated notification service that emails users or provides in-app alerts of performance milestones or trending opportunities.
7. **Deployment and Accessibility:** The application will be hosted on a cloud service-Vercel/AWS-and optimized for performance, scalability, and security, ensuring accessibility across devices [4][6].

8. Working Flowchart



9. Target Industries

1. **Digital Marketing Agencies:** To monitor the performance of different campaigns, track audience engagement, and identify trending topics for clients across platforms [3].
2. **Social Media Management Firms:** To streamline analytics, manage a variety of client accounts, and develop insights for improving content.
3. **Influencer and Creator Economy:** To help individual creators, influencers, and vloggers understand audience behavior, grow engagement, and plan future content strategies [7].
4. **Media and Entertainment Industry:** Analyzing viewer trends, popular topics, and audience sentiment to support content planning and promotions.
5. **E-commerce and brand promotion:** To identify trends in social media relevant to products or brands, and improve promotional content strategies [6].
6. **Market research and analytics companies:** Utilize aggregated social media data for consumer behavior studies, trend forecasting, and digital market insights [4][8].

10. Tools and Technologies

- **Frontend Technologies:**

  React.js: For building a responsive and dynamic user interface.

  HTML5, CSS3, JavaScript: For designing and styling interactive dashboard components.

  Chart.js / Recharts: To visualize analytics and performance graphs.

- **Backend Technologies:**

  Node.js & Express.js: For managing server-side operations, routing, and API communication.

  RESTful APIs for seamless interaction with the front and back ends, along with data from external sources.

- **Database:**

  MongoDB: A NoSQL database used to store user data, analytics, and trend information efficiently.

- **Machine Learning & AI:**

Python: For developing analytical and recommendation models.

Libraries: scikit-learn, pandas, NumPy, and NLTK for data processing and trend detection.

- **APIs and Integrations:**

  YouTube, Instagram, TikTok APIs: For gathering real-time social media data.

  Nodemailer / Resend API: To automate the sending of emails for alerts/notifications.

- **Development and Deployment Tools:**

  Git & GitHub: For version control and collaborative development.

  Vercel / AWS: For deployment and hosting of the web application.

  Postman: For API testing and validation.

11. Sustainable Development Goals (SDGs)

Sr. #	SDG	SDG Mapping to Requirements
1	**SDG 4 – Quality Education**	The project enhances digital literacy and analytical thinking by helping content creators, students, and professionals learn how to interpret data, analyze trends, and make informed digital decisions [6].
2	**SDG 8 – Decent Work and Economic Growth**	By supporting content creators, marketers, and small businesses in improving audience engagement and expanding reach, the system contributes to digital entrepreneurship and economic growth in the creative industry [7].
3	**SDG 9 – Industry, Innovation, and Infrastructure**	The platform promotes innovation through AI-driven analytics, machine learning, and cross-platform integration, strengthening digital infrastructure and advancing technological innovation [4].
4	**SDG 12 – Responsible Consumption and Production**	Through intelligent analysis of audience preferences and trends, the system encourages the creation of relevant, ethical, and meaningful content, reducing misinformation and promoting responsible media production [1].

12. Milestones

Sr. #	Milestone	Description	Expected Completion
1	**Project Proposal Submission**	Submission of detailed project proposal including objectives, methodology, and scope.	Week 2
2	**System Design & Architecture**	Designing system architecture, data flow diagrams, and selecting suitable tools and technologies.	Week 4
3	**Frontend Development**	Building the user interface using React.js and integrating dashboard components.	Week 7
4	**Backend Development**	Implementing server-side logic with Node.js, Express.js, and connecting the MongoDB database.	Week 9
5	**Machine Learning Model Integration**	Developing and integrating AI modules for trend detection, content analysis, and recommendation generation.	Week 11
6	**API Integration**	Connecting YouTube, Instagram, and TikTok APIs to fetch real-time data.	Week 12
7	**Testing and Debugging**	Conducting unit, integration, and user acceptance testing to ensure functionality and stability.	Week 14
8	**Final Deployment**	Deploying the complete web application on a hosting platform such as Vercel or AWS.	Week 15
9	**Report Submission and Presentation**	Preparing and submitting the final project report and presenting the completed system.	Week 16

13. Equipment Details

Sr. #	Equipment / Resource	Specification / Description	Purpose / Usage
1	**Laptop / Computer System**	Processor: Intel Core i5 or above RAM: 8 GB or higher Storage: 256 GB SSD minimum	Used for coding, testing, and running the development environment.

2	**Internet Connection**	Stable broadband or Wi-Fi connection (minimum 10 Mbps)	Required for accessing APIs, online resources, and deploying the web application.
3	**Cloud Hosting Platform**	Vercel / AWS / Render	For deploying and hosting the final web application.
4	**GitHub Repository**	Online version control and collaboration tool	To manage source code, track changes, and collaborate between team members.
5	**APIs Access**	YouTube, Instagram, and TikTok API keys	For collecting and analyzing social media data.
6	**Software Tools**	Visual Studio Code, Node.js, MongoDB Compass, Postman	For coding, testing APIs, and managing the backend database.
7	**Python Environment**	Python 3.8+ with libraries (scikit-learn, pandas, NumPy)	For developing and testing machine learning and trend analysis models.

14. Project Schedule Plan

Sr. #	Project Phase / Task	Description	Duration	Timeline (Weeks)
1	**Project Proposal & Approval**	Preparation and submission of proposal document for supervisor review and approval.	2 Weeks	Week 1 – Week 2
2	**System Design & Planning**	Designing system architecture, defining modules, and selecting tools and technologies.	2 Weeks	Week 3 – Week 4
3	**Frontend Development**	Developing the user interface and dashboard components using React.js.	3 Weeks	Week 5 – Week 7
4	**Backend Development**	Implementing backend logic using Node.js, Express.js, and integrating with MongoDB.	2 Weeks	Week 8 – Week 9

5	**Machine Learning Module**	Building AI-based content analysis and trend detection models in Python.	2 Weeks	Week 10 – Week 11
6	**API Integration**	Connecting APIs (YouTube, Instagram, TikTok) and fetching real-time data.	1 Week	Week 12
7	**Testing & Debugging**	Performing unit, integration, and user acceptance testing.	2 Weeks	Week 13 – Week 14
8	**Deployment & Finalization**	Hosting the web application and preparing the final documentation.	1 Week	Week 15
9	**Report Submission & Presentation**	Submitting final report and presenting the completed project.	1 Week	Week 16

15. Complex Engineering Problem Attributes

Sr. #	Attribute	Description / Justification
1	**Depth of Knowledge Required**	Involves the application of advanced knowledge in Artificial Intelligence, Machine Learning, Web Development, and Data Analytics to design an intelligent analytical system.
2	**Range of Conflicting Requirements**	Requires balancing between real-time data processing, accurate analysis, system performance, and API limitations across multiple social media platforms.
3	**Depth of Analysis Required**	Demands data-driven modeling, natural language processing, and trend forecasting, which involve complex analytical methods and algorithmic decision-making.
4	**Familiarity with Standards and Codes**	Follows best practices in API usage, data privacy, security standards, and software development methodologies.
5	**Depth of Design**	Integrates multiple technologies frontend, backend, machine learning, and APIs into a cohesive and scalable architecture requiring creative design solutions.

6	**Interdisciplinary Nature**	Combines concepts from Computer Science, Data Science, and Media Analytics to address challenges faced by content creators and marketers.
7	**Project Management**	Involves task scheduling, version control, and progress monitoring using modern project management tools like GitHub and Gantt charts.
8	**Innovation and Solution Feasibility**	Provides an innovative, AI-driven approach to automate trend detection and performance analytics, ensuring technical feasibility and societal relevance.
9	**Societal and Environmental Impact**	Encourages responsible digital content creation and promotes ethical media practices aligned with sustainability and digital literacy goals.

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