Phases of project

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Title: Analysis of Repetition in Teaching: A Data-Driven Approach

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# Phase 1: Project Needs Assessment and Planning

**Define Project Objectives:**

* Clearly define the project goals, including reducing content redundancy, optimizing the learning experience, and improving teaching efficiency.
* Identify expected outcomes, such as minimizing redundant content and creating coordinated course materials.

**Identify Courses and Content for Analysis:**

* Compile a comprehensive list of relevant courses and specific topics, such as "Artificial Intelligence" and "Data Visualization."
* Determine initial access to resources and collaborate with instructors to obtain course content.

**Define Similarity Metrics and Criteria:**

* Establish key criteria for identifying content similarities, including keyword identification, topic repetition, and overlap levels

# Phase 2: Data Collection and Preprocessing

**Gather Course Content Data:**

* Collect slides, handouts, assignments, and related resources from each course.
* Store files and data in a structured format (e.g., text files or searchable databases) for easier analysis.

**Preprocess Text and Data:**

* Normalize the data, including converting all text to lowercase, removing punctuation, and filtering stop words.
* Apply stemming or lemmatization for better analysis of synonyms.
* Segment content into analyzable portions and save in structured text or data formats.

# Phase 3: Prototype Development for Similarity Analysis

**Design the Similarity Analysis Algorithm:**

* Use Natural Language Processing (NLP) techniques such as TF-IDF, Word Embedding, and Doc2Vec for content similarity analysis.
* Implement clustering algorithms (e.g., K-Means or DBSCAN) to categorize topics and identify overlaps.

**Design a Dashboard for Results Visualization:**

* Create a dashboard to visually present analysis results with graphical charts. Include filtering options, course comparisons, and statistical reports.

**Test and Improve the Algorithm:**

* Validate the initial results and refine algorithms based on feedback.
* Conduct tests to evaluate accuracy and precision, applying optimizations as needed.

# Phase 4: Implementation and Initial Evaluation

**Test the Prototype with Limited Data:**

* Implement the prototype on a controlled dataset from selected courses.
* Gather feedback from instructors and students for initial refinement.

**Evaluate Prototype Performance:**

* Assess the system’s ability to identify overlaps and similarities.
* Measure performance metrics such as accuracy, recall, and error rates to ensure the prototype functions correctly.

**Prepare Initial Reports:**

* Generate analytical reports highlighting the extent of content overlapping between courses.
* Provide actionable recommendations to improve educational content and reduce redundancy.

# Phase 5: Planning for Full-Scale Development and Integration

**Design a Comprehensive System Architecture:**

* Develop an integrated system architecture capable of ingesting data from existing platforms like Teams and SharePoint.
* Plan APIs to enable communication between the prototype and other systems.

**Add Advanced Features:**

* Incorporate features like image analysis for slides and visual diagrams and enhance text analysis algorithms.
* Develop an automated alert system to notify instructors about excessive similarities.

**Integrate the Prototype into the LMS (e.g., Constructor LMS):**

* Design and implement widgets and dashboard tools to display similarity analysis results within the LMS.
* Ensure easy access to results for instructors and academic administrators via the LMS.

# Phase 6: Evaluation and Final Project Delivery

**Collect Final Feedback and Refinements:**

* Gather feedback from academic administrators, instructors, and students to make final adjustments.
* Analyze results to assess the prototype’s impact on improving educational content and learning experiences.

**Prepare Final Project Report:**

* Compile a comprehensive final report covering all stages, results, and analyses.
* Provide recommendations for optimizing course content and enhancing the quality of education