PHASES OF PROJECT

Date: 20.11.2024
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