**Projects designed to utilize Perplexity AI’s distinct features to enhance research and education at Carleton University, Ottawa, Ontario**

**Executive Summary**

This document outlines three novel projects utilizing Perplexity AI's distinctive features to enhance academic research and education:

1. Enhancing TIM Review Reader Engagement  
   Objective: To improve accessibility and searchability of the TIM Review's 700 journal articles using Perplexity AI's advanced search capabilities.

Key Deliverables:

* + Standardized database of articles
  + Custom search integration
  + User guide and engagement tools
  + Regular updates and analytics

1. Improving Literature Reviews  
   Objective: To enhance the process of conducting scoping and systematic literature reviews by integrating Perplexity AI.

Key Deliverables:

* + Training materials and resources
  + Literature search logs and synthesis
  + Drafts of literature review sections
  + Citation management files
  + Finalized literature reviews

1. Real-Time Lecture Content Validation  
   Objective: To enable real-time validation of lecture content using Perplexity AI, ensuring accuracy and promoting critical thinking.

Key Deliverables:

* + Validated lecture content
  + Interactive query examples
  + Student engagement activities
  + Post-lecture summaries
  + Faculty and student training resources

These three projects aim to leverage Perplexity AI's citation-based transparency, real-time information retrieval, and research-oriented capabilities to improve academic processes and outcomes. By implementing these initiatives, the institution seeks to enhance research quality, streamline literature reviews, and create more engaging, interactive learning experiences.

Perplexity AI is as a hybrid tool bridging the gap between generative AI and traditional search engines, catering especially to users who prioritize accuracy, source verifiability, and contextual understanding.

We believe that Perplexity AI is distinct because of its citation-based transparency, real-time information retrieval, and focus on interactive, research-oriented conversations.

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**Project 1: Using Perplexity AI to Enhance Engagement for TIM Review Readers**

**Objective**

To improve the accessibility, searchability, and engagement of the TIM Review's database of 700 journal articles by leveraging Perplexity AI’s advanced search capabilities. This project aims to provide readers with an efficient and transparent way to explore the corpus, enhance user experience, and foster deeper research engagement.

**Deliverable**

1. Standardized database of articles

* A clean, structured database of 700 TIM Review articles, enriched with metadata and exported in machine-readable formats (e.g., JSON, CSV).

1. Online hosting and accessibility

* A publicly accessible repository of articles, hosted on platforms like the TIM Review website, GitHub, or Zenodo, with proper indexing for search engine accessibility.

1. Custom search integration

* Advanced search functionalities tailored for the TIM Review corpus, implemented via:
  + Domain-specific queries optimized for Perplexity AI.
  + URL filtering techniques for narrowing search results.

1. User guide and engagement tools

* A detailed guide on using Perplexity AI to explore the TIM Review corpus, including effective query examples and refinement tips.
* A search widget or direct link embedded in the TIM Review website for seamless access to Perplexity AI queries.

1. User feedback and analytics system

* A feedback mechanism to gather insights on user experiences and identify challenges or areas for improvement.
* Analytics reports tracking search trends, popular queries, and satisfaction metrics to refine the system.

1. Regular updates

* An updated database reflecting newly published TIM Review articles, ensuring ongoing relevance and accuracy of search results.

1. Results of exploring advanced solutions

* Feasibility assessment and potential implementation of:
  + Direct integration with Perplexity AI’s systems for specialized indexing.
  + A custom conversational AI tool tailored to the TIM Review corpus for an enhanced user experience.

**Method**

**Step 1: Prepare the database**

1. Organize Articles:
   * Ensure the 700 articles are in a clean, standardized format (e.g., PDF, XML, JSON, or a structured database).
   * Include metadata for each article, such as title, authors, publication date, keywords, abstracts, and full text.
2. Metadata Enrichment:
   * If possible, add additional metadata such as thematic tags, citations, and topics to improve searchability.
3. Export in a Machine-Readable Format:
   * Convert the articles and metadata into a machine-readable format like JSON or CSV for compatibility with AI and search systems.

**Step 2: Integrate with Perplexity AI**

Perplexity AI does not allow direct uploading of custom datasets, so an intermediary approach is required to make the TIM Review corpus accessible. Options include:

1. Host the Corpus Online:
   * Publish the 700 articles in a structured, publicly accessible online repository (e.g., on the TIM Review website or platforms like GitHub or Zenodo).
   * Use structured URLs and ensure each article is indexed by search engines.
2. Develop an API:
   * Create a REST API for the TIM Review database that allows Perplexity AI or other tools to query the content directly.
   * The API should support advanced search capabilities (e.g., keyword, author, or topic search).
3. Enable Indexing:
   * Submit the hosted content to search engines so Perplexity AI can access and index the database.
   * Use SEO techniques (e.g., schema.org structured data) to enhance indexing by AI tools.

**Step 3: Tailor Perplexity AI usage**

1. Search Query Design:
   * Guide users on how to phrase queries effectively for Perplexity AI to return TIM Review-specific results.
   * For example:
     + "Find TIM Review articles on agile project management."
     + "TIM Review: AI and IoT integration in SMEs."
2. Use URL Filtering:
   * Suggest users append specific domain filters to their queries, e.g., "site:timreview.ca agile project management" to narrow the search to the TIM Review corpus.

**Step 4: Enhance user engagement**

1. Provide a Perplexity Guide:
   * Create a simple guide explaining how readers can use Perplexity AI to search the TIM Review corpus.
   * Include examples of effective queries and tips for refining results.
2. Embed Perplexity Search:
   * Add a custom search widget or link on the TIM Review website to redirect users to Perplexity AI with pre-configured query templates.

**Step 5: Monitor and improve**

1. Collect Feedback:
   * Include a feedback mechanism to understand how users are interacting with the system and identify challenges or improvements.
2. Analyze Usage:
   * Track search trends, popular queries, and user satisfaction to refine how the corpus is presented or indexed.
3. Update Regularly:
   * Keep the database updated with new TIM Review articles, ensuring Perplexity AI continues to reflect the latest content.

**Step 6: Explore advanced options**

If Perplexity AI's existing setup is insufficient to attain our goals, we will consider these advanced approaches:

* Custom Integration: Collaborate with Perplexity AI’s team to explore direct integration or specialized indexing of the TIM Review corpus.
* Custom AI Tool: Develop a TIM Review-specific conversational AI tool using OpenAI or similar technologies to provide a tailored exploration experience.

**Project 2: Improving scoping and systematic literature reviews with Perplexity AI**

**Objective**

To enhance the process of producing scoping and systematic literature reviews by integrating Perplexity AI, enabling faculty and students to efficiently perform comprehensive searches, synthesize key insights, ensure citation transparency, and organize findings based on real-time, research-driven results.

**Deliverables**

1. Training materials and resources
   * A guide on how to effectively use Perplexity AI for literature review tasks.
   * Video tutorials demonstrating search query formulation, citation evaluation, and data synthesis.
   * A list of recommended search techniques and examples for efficient querying.
2. Literature search logs
   * A log of systematic search queries used, including refined keywords and search strategies.
   * Categorized lists of retrieved articles based on themes or subtopics relevant to the literature review.
3. Synthesis
   * Summaries of key findings from the retrieved articles, organized by thematic areas (e.g., research gaps, methodologies, key outcomes).
   * Identification of knowledge gaps in the current literature.
4. Drafts of literature review sections
   * Drafted sections of the literature review (e.g., Introduction, Methodology, Discussion), supported by Perplexity AI’s summaries and citations.
   * A section summarizing the relevance and contributions of the reviewed articles.
5. Citation management files
   * A list of articles with proper citations in the required format (e.g., APA, MLA), generated through Perplexity AI.
   * Exported citation data integrated into reference management tools (e.g., Zotero, EndNote).
6. Finalized literature review
   * A completed, refined systematic or scoping review, incorporating key insights from the AI-assisted process, with correct citations and identified research gaps.
7. Feedback and improvement log
   * A compilation of feedback from users (faculty and students), including challenges faced, suggestions for improvement, and best practices for future use of Perplexity AI in literature reviews.

**Method**

Step 1: Familiarize Faculty and Students with Perplexity AI

1. Introduction Workshop:
   * Conduct a session introducing Perplexity AI, highlighting its key features such as citation-based transparency, real-time retrieval, and research-oriented conversations.
   * Demonstrate examples of how it can be used for academic research, especially in literature reviews.
2. Provide Tutorials:
   * Share step-by-step guides, videos, or documentation on how to use Perplexity AI effectively for query formulation, refining searches, and evaluating results.
3. Encourage Hands-On Practice:
   * Assign practice tasks like identifying articles on a broad topic (e.g., "sustainability in supply chains") to familiarize users with query refinement and source evaluation.

Step 2: Define Research Questions and Scope

1. Clarify Objectives:
   * Instruct users to formulate clear research questions and objectives for their reviews.
   * Example: "What are the applications of AI in healthcare for improving patient outcomes?"
2. Generate Search Terms:
   * Use Perplexity AI to brainstorm and refine keywords, phrases, and synonyms.
   * Query example: “What are key search terms for AI in healthcare research?”

Step 3: Perform Systematic Searches

1. Formulate Queries:
   * Teach users to craft precise, systematic queries in Perplexity AI. Examples:
     + “Find systematic reviews on AI in healthcare published after 2015.”
     + “Cite the most relevant studies on AI in patient outcome optimization.”
2. Use Iterative Refinement:
   * Encourage follow-up queries to refine searches. For instance:
     + Initial query: “AI in healthcare.”
     + Follow-up: “Focus on ethical implications of AI in patient data use.”

Step 4: Evaluate and Organize Results

1. Assess Credibility:
   * Verify sources cited by Perplexity AI for academic integrity (e.g., check journals’ impact factors or publishers’ credibility).
2. Categorize Findings:
   * Use Perplexity AI to group articles into themes or categories.
   * Example query: “Organize research on AI in healthcare into themes like diagnostics, treatment, and administration.”
3. Create a Source Log:
   * Maintain a database of relevant articles with details like title, authors, abstract, and citation link.

Step 5: Analyze and Synthesize the Literature

1. Summarize Key Insights:
   * Use Perplexity AI to summarize findings from retrieved articles.
   * Example: “Summarize key findings on AI’s role in medical diagnostics from the top 5 cited articles.”
2. Identify Gaps:
   * Query for knowledge gaps in the literature.
   * Example: “What gaps exist in research on AI for patient monitoring systems?”

Step 6: Write the Review

1. Draft Sections with AI Assistance:
   * Use Perplexity AI to draft parts of the review:
     + Introduction: “Write an introduction on AI in healthcare using these articles.”
     + Methodology: “Summarize how articles were selected and analyzed.”
2. Cite Sources Correctly:
   * Extract citations directly from Perplexity AI in the required format (e.g., APA, MLA) and ensure proper attribution.

Step 7: Validate and Refine

1. Cross-Check Results:
   * Compare findings from Perplexity AI with manual searches in academic databases like PubMed or Scopus for completeness.
2. Iterative Refinement:
   * Ask Perplexity AI to refine drafted sections or suggest improvements.
   * Example: “Improve clarity in the discussion of ethical implications.”

Step 8: Educate on Advanced Use

1. Advanced Query Techniques:
   * Train users to use Boolean operators and filters to tailor queries further.
2. Custom Tool Integration:
   * Encourage the integration of Perplexity AI outputs with tools like Zotero or Mendeley for better reference management.

Step 9: Feedback and Iteration

1. User Feedback:
   * Collect feedback from faculty and students on their experiences using Perplexity AI for literature reviews.
2. Iterative Improvements:
   * Use feedback to refine training sessions and identify best practices for incorporating Perplexity AI into academic workflows.

Step 10: Share Success Stories

1. Publish Case Studies:
   * Highlight successful examples of faculty and students using Perplexity AI for literature reviews.
2. Encourage Peer Sharing:
   * Foster a community where users share tips, challenges, and solutions for optimizing Perplexity AI in academic research.

**Project 3: Real-Time Validation of Lecture Content Using Perplexity AI**

**Objective**

To enable university faculty and students to validate lecture content in real time by leveraging Perplexity AI’s citation-based transparency, real-time information retrieval, and research-oriented capabilities. This process ensures the accuracy, reliability, and relevance of educational material while promoting critical thinking and interactive learning.

**Deliverables**

* 1. **Validated lecture content**
* Lectures enriched with real-time fact-checking and updated with verified data from credible sources.
* Identification of any discrepancies in claims or data and their resolution.
  1. **Interactive query examples**
* A collection of sample queries tailored to specific lecture topics for validating key assertions.
  1. **Reference list**
* A curated list of credible, AI-retrieved sources cited during or after lectures, shared with students for further reading.
  1. **Student engagement activities**
* Interactive exercises for students to practice validating lecture content using Perplexity AI during and after the lecture.
  1. **Post-lecture summary**
* A report summarizing validated claims, corrected inaccuracies, and additional insights gained from AI-driven research.
  1. **Faculty and student training resources**
* Tutorials, guides, and best practices for effectively using Perplexity AI to validate academic content in real time.
  1. **Feedback and improvement framework**
* A feedback loop for faculty and students to assess the impact of using Perplexity AI on learning outcomes, with suggestions for iterative improvements.

**Method**

Step 1: Introduce Faculty and Students to Perplexity AI

1. Training session:
   * Conduct a workshop to demonstrate how Perplexity AI works, focusing on its ability to retrieve real-time, source-cited information.
   * Highlight its strengths: citation transparency, accuracy, and research-oriented conversations.
2. Provide access:
   * Ensure faculty and students have easy access to Perplexity AI during lectures, either via personal devices or an integrated system.

Step 2: Prepare the lecture Content for validation

1. Identify Key Assertions:
   * Break down the lecture content into discrete assertions or claims that can be verified.
   * Example: "AI-driven tools improve supply chain efficiency by 30%."
2. Formulate Validation Questions:
   * Convert assertions into questions that can be queried in Perplexity AI.
   * Example: "What is the impact of AI on supply chain efficiency in manufacturing?"
3. Set Search Parameters:
   * Specify the focus of the query (e.g., peer-reviewed articles, case studies, industry reports).
   * Include keywords relevant to the lecture topic.

Step 3: Use Perplexity AI During the Lecture

1. Query Real-Time Validation:
   * Faculty or students input queries into Perplexity AI during or immediately before the lecture to validate claims or find supporting evidence.
   * Example query: "Recent studies on AI improving supply chain performance."
2. Review Results and Citations:
   * Evaluate the sources provided by Perplexity AI for credibility, publication date, and relevance.
   * Discuss these findings in real time, showing students how to verify information critically.

Step 4: Incorporate Validation into Lecture Delivery

1. Live Fact-Checking
   * Use Perplexity AI to fact-check statements as they are presented, especially for new or controversial claims.
   * Example: "Is the claim that 'solar energy adoption has grown by 20% annually in the last decade' supported by data?"
2. Source Comparison
   * Compare the sources and data retrieved by Perplexity AI with those originally cited in the lecture to identify discrepancies or reinforce accuracy.
3. Interactive validation activity
   * Encourage students to validate additional points from the lecture using Perplexity AI, promoting active participation and critical thinking.

Step 5: Post-lecture review

1. Consolidate Findings:
   * After the lecture, summarize the validated points and address discrepancies where the content did not align with the AI-validated sources.
2. Update Lecture Materials:
   * Incorporate validated data and updated sources into future versions of the lecture for improved accuracy.
3. Provide References:
   * Share a curated list of sources retrieved via Perplexity AI with students for further reading.

Step 6: Build a culture of validation

1. Integrate into Course Design:
   * Embed Perplexity AI usage as a regular part of the teaching and learning process.
   * Require students to use the tool to validate their assignments or project content.
2. Feedback Loop:
   * Encourage faculty and students to provide feedback on how Perplexity AI impacts lecture validation and learning outcomes.
3. Monitor trends:
   * Analyze recurring queries and results to identify areas where lecture content could be improved or updated.

Step 7: Explore advanced applications

1. Custom Perplexity AI Integration:
   * Develop a customized interface for Perplexity AI that aligns with the curriculum and specific topics covered in lectures.
2. Collaborate with Perplexity AI Developers:
   * Work with the Perplexity AI team to create tailored features, such as pre-configured topic-based queries for courses.
3. Real-Time Engagement Metrics:
   * Use AI to track which points in the lecture prompt the most queries, providing insights into areas where students seek clarity.

**Other projects**

**Project 4: Collaborative research synthesis**

Objective: To facilitate interdisciplinary collaboration and comprehensive literature reviews using Perplexity AI's real-time information retrieval and citation-based transparency.

**Project 5: AI-Assisted grant writing workshop**

Objective: To improve graduate students' grant writing skills by leveraging Perplexity AI's research capabilities and up-to-date information retrieval.

**Project 6: Thesis defense reparation**

Objective: To prepare graduate students for thesis defense by using Perplexity AI to anticipate questions and strengthen arguments.

**Project 7: Adaptive research methodology course**

Objective: To create a flexible, up-to-date research methodology course that adapts to emerging trends and student needs using Perplexity AI.