**User Requirements Specification (URS)**

**1. Purpose and Scope**

The Deep Research Workflow system is designed to automate and enhance research, report drafting, and document generation for users who need high-quality, trustworthy, and well-formatted information. The system should facilitate both automated and human-in-the-loop steps, ensuring output accuracy, clarity, and professional presentation.

**2. Intended Users**

* Researchers and analysts
* Managers and decision-makers
* Content creators and technical writers

**3. System Requirements**

**3.1. User Input & Planning**

* Users shall be able to submit a research question or prompt through a user interface.
* The system shall generate a structured research plan based on the user’s prompt.
* Users shall review, approve, or request modifications to the generated plan before research proceeds.

**3.2. Automated Research and Writing**

* The system shall automatically conduct research using reputable online sources and academic databases.
* The system shall support searches via:
  + General web search (e.g., DuckDuckGo, Tavily)
  + Scholarly search (Google Scholar, Semantic Scholar, arXiv, PubMed, OpenAlex, Crossref)
  + Fact-based resources (Wikipedia, Wikidata)
* The system shall be capable of extracting relevant content from web pages and academic articles.
* The system shall automatically generate a draft report based on gathered research.

**3.3. Quality Control and Feedback**

* The system shall include an agent to review the draft report for completeness, clarity, and relevance.
* Users shall be able to review, approve, or request corrections to the draft report.
* The system shall limit automated correction cycles (e.g., max three iterations) before escalating to the user for input.

**3.4. Formatting and Output**

* The system shall apply standardized formatting and citation styles as required by the user or organization.
* The system shall be able to generate charts, tables, and summaries where relevant.
* The system shall export the final document in PDF and/or DOCX format.

**3.5. Human-in-the-Loop Control**

* The system shall require user approval at critical checkpoints:
  + Before research begins (after planning)
  + Before the final document is produced (after review and revision)
* The system shall escalate to the user if automated processes cannot resolve errors or complete tasks after the maximum allowed attempts.

**3.6. Security, Privacy, and Compliance**

* The system shall securely store and manage all user data and credentials.
* The system shall comply with applicable data privacy regulations.

**3.7. Usability**

* The user interface shall be intuitive and require minimal training.
* Users shall be able to view, download, and share final reports.
* System messages and errors shall be clear and actionable.

**3.8. Extensibility and Maintenance**

* The system shall be modular, supporting the addition of new data sources, agents, or document templates with minimal disruption.
* The system shall log errors and track system performance for ongoing improvement.

**4. Success Criteria**

* Users can generate high-quality, well-structured research reports with minimal manual effort.
* Users can intervene at key decision points to ensure output aligns with their needs.
* The system produces professionally formatted documents suitable for distribution or publication.

**5. Constraints and Exclusions**

* The system is not required to access paywalled or proprietary content unless provided with access credentials by the user.
* The system is not responsible for the scientific accuracy of third-party data sources, only for correctly retrieving and citing them.

**6. References**

* Technical Specification: Deep Research Workflow System
* Deep Research Workflow Diagram