

Building an AI-CRIS Platform: Multilingual, Contextual, and Predictive Research Data Access

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Extended Abstract

Current Research Information Systems (CRIS) have become essential tools for universities and research institutions to manage, analyze, and disseminate information about research activities, outputs, and collaborations. Traditional CRIS platforms provide structured repositories for publications, projects, grants, and researcher profiles, supporting reporting obligations and strategic decision-making. However, these systems often operate retrospectively and rely on manual data retrieval, limiting their ability to provide dynamic, context-aware, and predictive insights (Guillaumet, 2024; Hartmann & Niederlechner, 2024). The increasing volume, heterogeneity, and complexity of research data require intelligent solutions that not only organize information but also enable proactive knowledge discovery and decision support (Azeroual & Schöpfel, 2019). Addressing these challenges, this study presents the development of an AI-enhanced Current Research Information System (AI-CRIS), named GCRIS AI, implemented for the İzmir Institute of Technology (see Fig. 1).

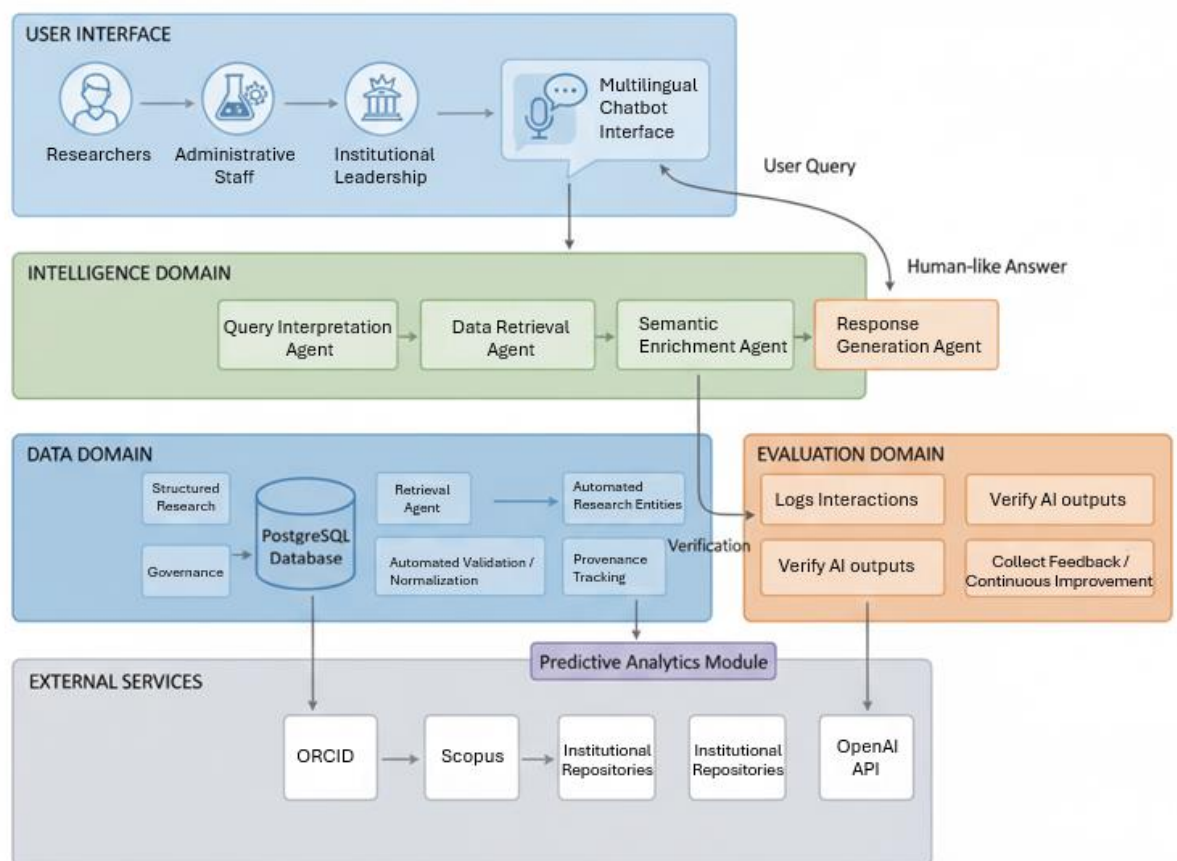


Fig. 1. Architecture and Workflow of the AI-CRIS Platform (GCRIS AI).

The GCRIS AI module introduces a novel approach to research information management by integrating artificial intelligence capabilities directly into the CRIS environment. Its primary

component is a multilingual chatbot, which serves as an intelligent assistant for researchers, administrators, and institutional leadership. The chatbot leverages natural language processing (NLP) and semantic understanding to interpret user queries, retrieve relevant information from the institutional GCRIS database, and provide precise, contextual, and actionable responses. Ensuring consistent multilingual capability in AI systems remains a challenge; recent work demonstrates strategies for improving performance across multiple languages (Agarwal et al., 2025; Azeroual, 2025). This interaction paradigm transforms the user experience by allowing dynamic, conversational access to research data, replacing traditional static queries and complex search forms, thereby supporting the increasing internationalization of research and inclusivity for diverse user groups.

From a technical perspective, the AI-CRIS platform is built using a multi-agent architecture, enabling modular, scalable, and fault-tolerant operations. Agents are responsible for distinct tasks such as query interpretation, data retrieval, semantic enrichment, and response generation. PostgreSQL is employed as the underlying database management system, providing a robust and flexible structure for the storage of heterogeneous research data, including publications, projects, affiliations, and researcher identifiers. Integration with external sources, such as ORCID, Scopus, and institutional repositories, ensures that the system can unify researcher identities, track collaborations, and maintain a comprehensive, up-to-date record of research activities. The OpenAI API provides advanced NLP and generative capabilities, supporting the understanding of complex, context-dependent queries and enabling the generation of human-like, explanatory responses.

The GCRIS AI module also emphasizes data quality, provenance, and governance. Automated data validation and normalization procedures ensure consistency across records, while semantic enrichment enhances the discoverability and interpretability of research outputs. Each interaction is logged and analyzed to improve system performance and user satisfaction over time. Moreover, ethical AI practices, including explainability, transparency, and privacy compliance, are embedded in the design to build trust among users and safeguard sensitive information. By providing clear explanations for its responses and predictive insights, the system supports informed decision-making and mitigates concerns about black-box AI behavior.

A key innovation of the AI-CRIS platform lies in its predictive and proactive capabilities. Beyond responding to queries, the system can analyze historical data, identify emerging research trends, and suggest potential collaboration opportunities. Predictive modeling algorithms assess patterns in publications, project outputs, and funding applications to offer insights that can inform strategic planning at both departmental and institutional levels. This approach allows institutions to move from reactive reporting to proactive research management, enhancing competitiveness and facilitating evidence-based decision-making.

The GCRIS AI pilot implementation at the İzmir Institute of Technology also serves as a testbed for participatory design and user-centered development. Researchers, administrative staff, and leadership are engaged through workshops, focus groups, and iterative feedback cycles to ensure that the system meets practical requirements, integrates seamlessly with

existing workflows, and delivers interpretable and actionable outputs. The pilot demonstrates that AI-enhanced CRIS platforms can bridge the gap between complex data infrastructures and end-user needs, fostering adoption and satisfaction among diverse stakeholders.

Looking forward, the AI-CRIS platform is envisioned as a foundation for a fully integrated, institution-wide research information ecosystem. Future developments include the expansion of the chatbot to support proactive alerts, recommendations for grant applications, personalized dashboards, and advanced analytics for institutional reporting. The modular architecture ensures scalability and transferability, allowing other research institutions and CRIS platforms to adopt the solution with minimal adaptation. By combining multilingual support, semantic intelligence, and predictive analytics, the AI-CRIS platform represents a significant advancement in the management of research information, positioning institutions to respond proactively to evolving scientific landscapes.

The GCRIS AI module demonstrates the transformative potential of integrating artificial intelligence into Current Research Information Systems. By providing multilingual, contextual, and predictive access to research data, the platform enhances the efficiency, transparency, and strategic value of CRIS infrastructures. The pilot at the İzmir Institute of Technology illustrates both the practical feasibility and the benefits of deploying AI-enhanced research management systems in real-world institutional contexts, while also highlighting challenges such as data integration, user adoption, and governance. The experiences and insights gained from this implementation serve as a valuable reference for other universities and research institutions aiming to modernize their CRIS capabilities, strengthen data-driven decision-making, and foster proactive, evidence-based management of research activities.

Keywords

Current Research Information Systems (CRIS), Artificial Intelligence (AI), Research Information Management, Multilingual Chatbot, Predictive Analytics, Data-driven Decision Support.

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