

Smarter Research: Integrating AI into CRIS Systems

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Agenda

1. Welcome & Vision
2. Understanding Today's CRIS Systems
3. AI – A Brief Primer
4. CRIS + AI = A Perfect Match
5. Use Cases
6. From Static to Smart CRIS
7. FAIR, Ethical, Explainable
8. Added Value for Institutions
9. Let's Build the Future Together
10. Next Steps

Opening Quote & Vision

Data is the new oil – but AI is the refinery

Vision: How AI can make CRIS systems smarter and more impactful?

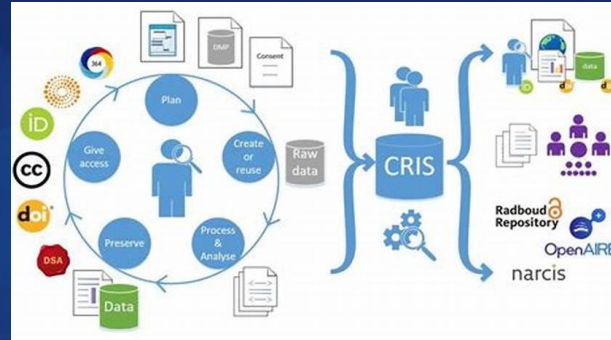
AI technologies can streamline data management in CRIS systems by automating data entry, enhancing data accuracy, and providing predictive analytics, which collectively lead to more informed research decisions and improved institutional outcomes.



Overview of CRIS Systems Today

'Current Research Information Systems (CRIS): What are they and what do they do?'

James Toon
Research Information Systems Manager, University of Edinburgh
17th March 2015
@jamestown

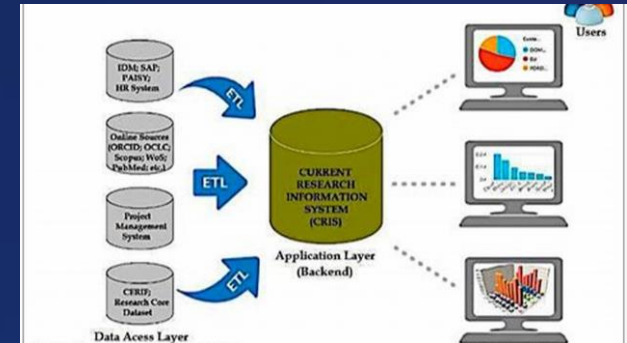


Functions and Benefits

CRIS systems serve as centralized repositories for managing research outputs, facilitating collaboration, tracking funding, and enhancing institutional visibility in the academic landscape.

Key Data Types

Essential data types in CRIS include publications, grants, research data, and patents, which collectively inform funding strategies and assess research impact and innovation.



Current Limitations

Today's CRIS systems face challenges such as fragmented data access, outdated user interfaces, and insufficient analytical tools, hindering effective research management and collaboration.

Artificial Intelligence (AI) – A Brief Primer

Core AI Technologies Overview

Natural Language Processing, Machine Learning, and Generative AI are pivotal in transforming data analysis and research methodologies, enabling enhanced discovery, connectivity, and innovation across various academic and professional fields.



CRIS + AI = A Natural Match

01

Automation and Efficiency Gains

AI enhances CRIS systems by automating routine tasks, allowing researchers to focus on high-value activities, thus improving overall research productivity and efficiency.

02

Enhanced Data Quality and Insights

The integration of AI improves data accuracy and provides novel insights, enabling researchers to make informed decisions and drive innovative scientific discoveries.

Use Case 1 – Automated Literature Tagging



NLP for Abstract Analysis

Natural Language Processing (NLP) tools like spaCy and BERT efficiently analyze abstracts and titles, enabling precise classification and enhancing research discoverability across various topics.



Automatic Topic Classification

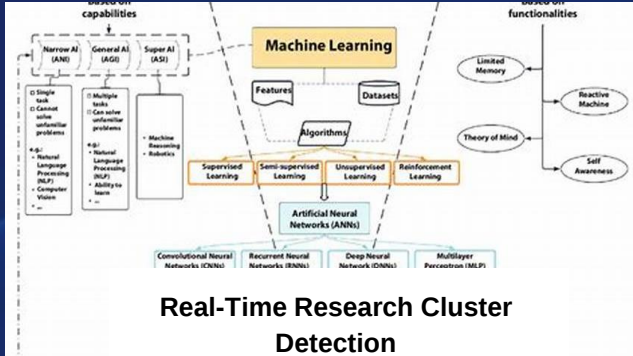
Automated systems categorize literature by topics, disciplines, and Sustainable Development Goals (SDGs), streamlining the organization of research outputs and improving reporting capabilities.



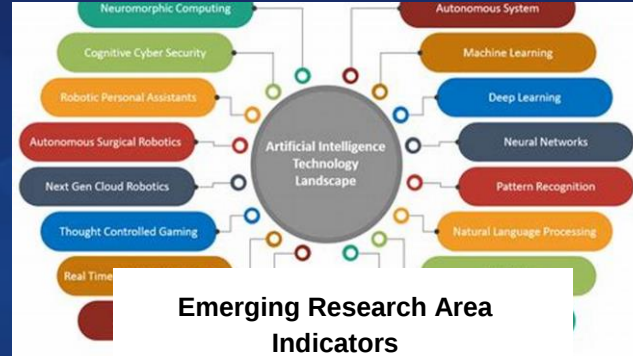
Enhanced Discoverability Tools

Leveraging AI-driven tools such as OpenAI facilitates improved discoverability of research materials, allowing researchers to access relevant literature quickly and effectively.

Use Case 2 – Topic Clustering & Trend Analysis



Machine Learning algorithms analyze vast datasets to identify and categorize emerging research clusters, enabling researchers to stay ahead of trends and innovations.



By monitoring patterns in research outputs, ML provides early indicators of developing fields, assisting institutions in strategic planning and resource allocation.



Advanced visualization tools illustrate connections between research topics and clusters, enhancing understanding of collaborative opportunities and guiding future research directions.



Use Case 3 – Grant Prediction Engine

Enhanced Predictive Accuracy

Utilizing advanced regression techniques such as Scikit-Learn and XGBoost allows for more precise predictions of grant success, enabling institutions to strategically allocate resources and prioritize projects with the highest potential for funding success.

Use Case 4 – AI-driven Researcher Profiling

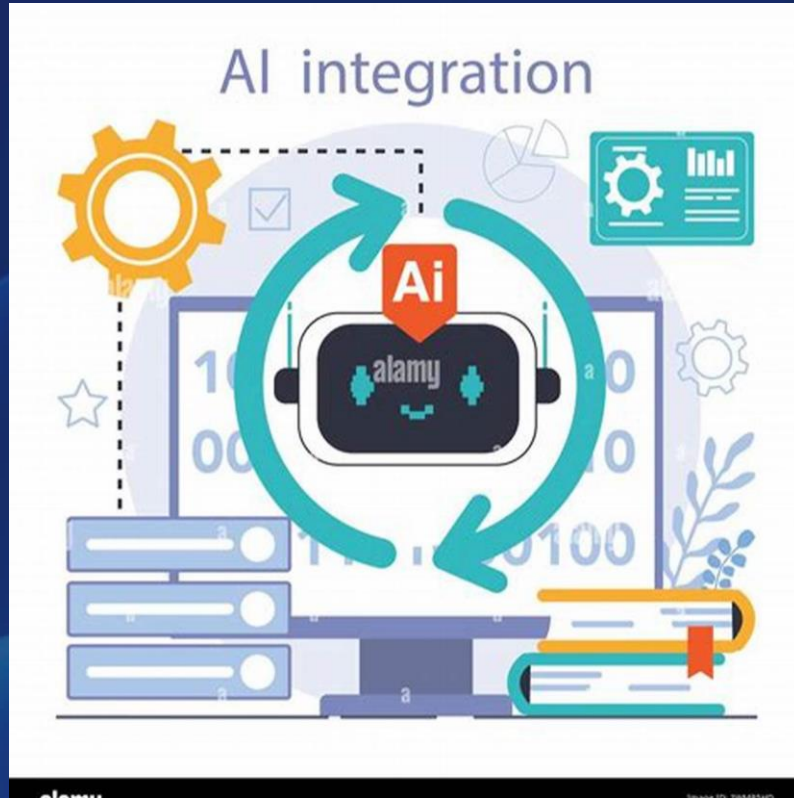
Automated Funding Call Matching

Leveraging AI algorithms, researchers can be automatically matched with relevant funding opportunities based on their profiles, enhancing the likelihood of successful applications.



Career Support Mechanisms

AI-driven insights provide personalized funding suggestions, aiding researchers in career development by aligning their expertise with available financial resources and opportunities.



From Static to Smart CRIS

Automated Data Integration

The transition from static to smart CRIS involves seamless integration of external data sources like ORCID and Crossref, enhancing data richness and accessibility, thereby facilitating more dynamic research management and collaboration opportunities.

FAIR, Ethical, Explainable

01

Addressing Bias in AI

Implementing robust methodologies to identify and mitigate bias in AI algorithms ensures equitable outcomes, fostering trust and integrity in research outputs and processes.



02

Transparency in Data Usage

Establishing clear protocols for data handling and sharing enhances transparency, allowing stakeholders to understand data sources and methodologies, thus promoting ethical research practices.



03

Explainable AI for Trust

Developing Explainable AI frameworks enables researchers to interpret AI-driven decisions, ensuring accountability and fostering confidence in automated systems within research environments.

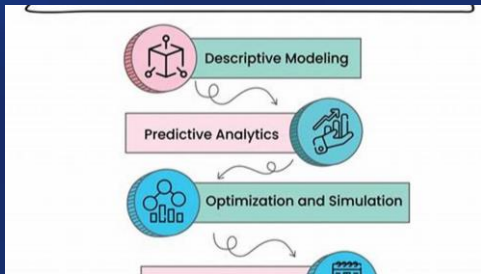


Added Value for Research Institutions



Reduced Manual Effort

Implementing AI-driven solutions minimizes repetitive tasks, allowing researchers to allocate more time to critical analysis and innovative research activities, enhancing overall productivity.



Deeper Insights from Existing Data

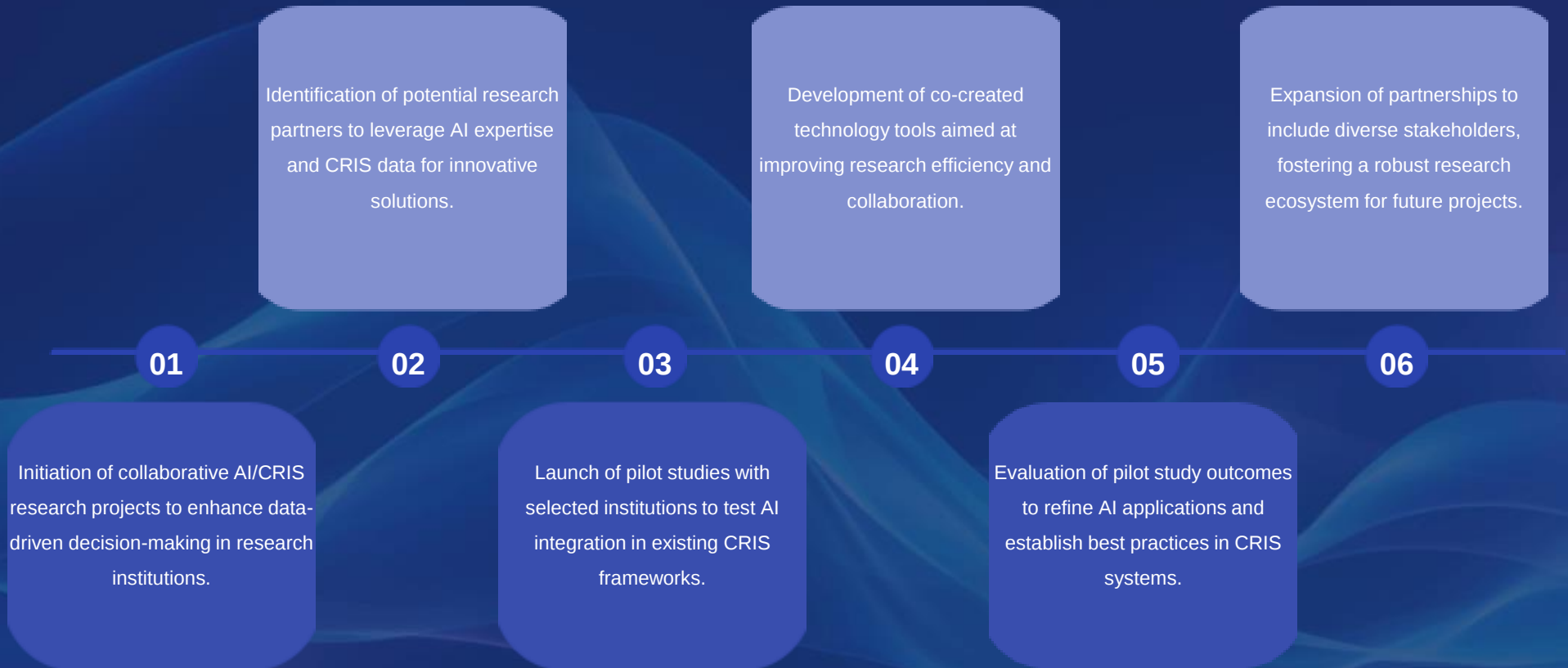
Advanced analytics tools enable institutions to extract meaningful patterns and trends from existing datasets, facilitating informed decision-making and strategic planning in research initiatives.



Policy-Relevant Analysis and Benchmarking

AI capabilities support comprehensive evaluations of research impact, providing institutions with essential insights for policy development and benchmarking against peers in the academic landscape.

Collaborative AI/CRIS Research Projects



Engaging with Research Institutions and Partners

Strategic Partnership Development

Establishing strategic partnerships with diverse research institutions and technology providers is essential for leveraging AI capabilities, enhancing collaborative research efforts, and driving innovation in CRIS systems to achieve shared research objectives.



Next Steps for Collaboration

➤ **01**

Joint Research Proposals

Collaborate on proposals targeting EU, BMBF, and DFG funding to enhance research capabilities and secure necessary resources.

Co-Creation of Open Tools

Develop open-source tools that align with FAIR principles, promoting transparency and accessibility in research methodologies.

02 ➤

➤ **03**

Hackathons and Workshops

Organize events to stimulate innovative solutions and share best practices for AI integration in CRIS systems among researchers.

Let's Talk



O&A / Open Discussion





Thank You!

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