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Impact of AI in Research Data Management on Library Administration: VISION-2035

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Abstract: *The use of AI in libraries offers revolutionary possibilities in several fields, embracing creative solutions and transforming conventional methods. Chatbots are one example of how the Industrial Revolution 4.0 has resulted in the substitution of services with machines to increase performance and quality. Improving user experiences using NLP and artificial intelligence (AI). Now Librarians have been forced to respond with service innovations in data science and research data management (RDM) due to the recent developments in network technologies and scholarly communication, which give academic libraries the chance to seek out new ways to interact with researcher communities. The purpose of this study is to examine research data management services offered by research libraries. One of the main emerging themes in academic libraries is the facilitation of research data management for the benefit of researchers and institutions. The purpose of this work is to examine how libraries might offer these kinds of services for managing research data and integrate all universities and research centres, government departments into one network named the Research Database Management System (RDMS). This study covers the importance of research data, its organisation, distribution, preservation, and the vital role of researchers and professors in their daily research updates and life cycle. The librarians examine current tools and technologies that could be utilised to successfully implement Research Data Management (RDM) services, providing a comprehensive description of RDM as a service. The article shows that 90% of libraries are going to convert from a manual traditional management system to automation. This automation is now moving toward AI technology; this chain development enhances the robotic technology to involve robotics-integrated blockchain technology in library administration.*

Keywords: research data management, database, repository, ready reference services, vision, data storage, data archiving, data preservation, data transformation, data reuse.

INTRODUCTION

As innovation continues to spread quickly throughout many industries, education has made great strides in embracing the newest technologies, particularly in libraries. Artificial intelligence plays a significant role in education today. The current impact of AI on library administration. By assisting with user engagement, reading material discovery, classification, cataloguing, and staff problem-solving, artificial intelligence is quickly changing library operations. Through creativity and wise decision-making, it can improve the library service system for both professionals and patrons. Future trends in library automation and the impact of AI on library administration are important elements that will influence libraries in the future. Even in the face of challenges like ethical dilemmas, AI adoption proposes to advance libraries towards a dynamic and inclusive future of knowledge distribution.

Artificial Intelligence in Library Administration:

Artificial intelligence refers to computer programs that are capable of tasks like speech recognition, object identification, prediction, and natural language generation that are normally associated with human intellect. The term artificial intelligence (AI) encompasses a wide range of technologies, including deep learning, machine learning, and natural language processing (NLP) (Dewi C, 2024)[1]. Libraries have traditionally been a repository for knowledge and information. Dr SRR, the father of library science, stated in his fourth law, *"Save the time of the reader."* According to his laws, AI technology is now playing a crucial role in every industry, including library services, and as its technology advances, its functions also alter. The delivery of user services and the preservation of information in library systems are being revolutionised by artificial intelligence. AI is revolutionising library automation, which is the use of computers to automate manual processes like circulation and cataloguing. AI integration has the potential to increase content discovery, improve user experiences, and revolutionise library operations and services (Albertos, 2025)[3].

LITERATURE REVIEW

Mgbodichima et al (2020)[7] In their Studies Identified research data management tools and applications, which include DMP online, Data Asset framework, Collaborative Assessment of Research Data Infrastructure and Objectives (CARDIO), and Curation cost exchange. Specifically, the paper examines some skills requirements for research data management in academic libraries. Some of the challenges facing effective research data management services identified by this paper include technology obsolescence, technology fragility; Lack of guidelines on good practice, inadequate financial and human resources to manage data well, and Lack of evidence about best infrastructures.

Mallikarjun D (2015)[9], outlining in their research, the technologies and tools that could be used in a successful RDM service deployment, the authors try to give a clear explanation of Research Data Management (RDM) as a service. Additionally, the paper is an attempt to share the experience of developing the research data repository for the Vikram Sarabhai Library using the open-source program CKAN.

Aim of the Study:

Artificial intelligence (AI) can be used by libraries to predict the needs and preferences of their patrons and to recommend specific reading materials for each user based on their interests, browsing history, borrowing habits, and preferences. Libraries have been experimenting with robotic retrieval and storage systems, using artificial intelligence (AI) to automate tasks like bookshelf management and data migration. The study looks at upcoming developments in library automation and investigates the current effects of AI on library management.

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Life Cycle of Research Data Management (RDM):

Fary and Owen (2013)[5] emphasised the significance of comprehending the data lifecycle. Any institution's data management is influenced by the lifecycle, which is summed up as follows: Data Creation, Data Collection and Description, Data Storage, Data Archiving and Preservation, Data Access, Data Discovery and Analysis, Data Reuse and Transformation.

Digital Curation: As a relatively new job for libraries, digital curation necessitates careful thought and execution. To effectively engage in research groups, data librarians must learn new skills and information. To accommodate these developments, library and information education must also change, including through ongoing professional development (Yaroshenko 2023)[7].

Fig.1. Digital Curation Sources: DCC[4]

Database Management and its Usages:

Data: Data security and privacy are being ensured via open data initiatives. Sensitive information must be preserved within ethical and legal frameworks in many research datasets, especially in disciplines like medicine and social sciences (Scheibner et al., 2020[25]). Libraries must make sure their operations are in line with institutional data policies and comply with legislation such as the General Data Protection Regulation (GDPR) (Banciu & Mantykangas, 2018[24]). Libraries and researchers must make sure they don't jeopardise participant confidentiality even while open science advocates for widespread access. Libraries frequently face ethical issues, outmoded infrastructure, and insufficient finances (Santos-Hermosa & Boté-Vericad, 2024[22]; Tzanova, 2020[23]). A strategic approach that strikes a balance between innovation and sustainability is needed to overcome these obstacles (DB Vyas 2025[27]).

Frequently Used Databases for research include Scopus, Web of Science, PubMed, IEEE Xplore, ScienceDirect, and JSTOR, which are bibliographic and literary resources. The Directory of Open Access Journals (DOAJ) is a repository of open-access journals.

Classification of Database Types: Databases are classified mainly into Open Data, Open Science and Subscribed Data. These are stored on various farms. They are classified into 12 types based on their various use and functionalities. They are given below:

Database Types	Nature
Hierarchical Database	Open/Subscribed
Network Database	Open/Subscribed
Objective-Oriented Database	Open/Subscribed
Relational Database	Open/Subscribed
Cloud Database	Open/Subscribed
Centralized Database	Open/Subscribed
Personalized Database	Open/Subscribed
Operational Database	Open/Subscribed
NoSQL Database	Open/Subscribed
Graph Database	Open/Subscribed

Tab 1. Database Types

Hierarchical Database: Data is arranged in hierarchical databases in a form like a tree, with each parent record potentially having several child entries. This model performs best in situations when the data is grouped in levels or ranks according to a predetermined hierarchical relationship.

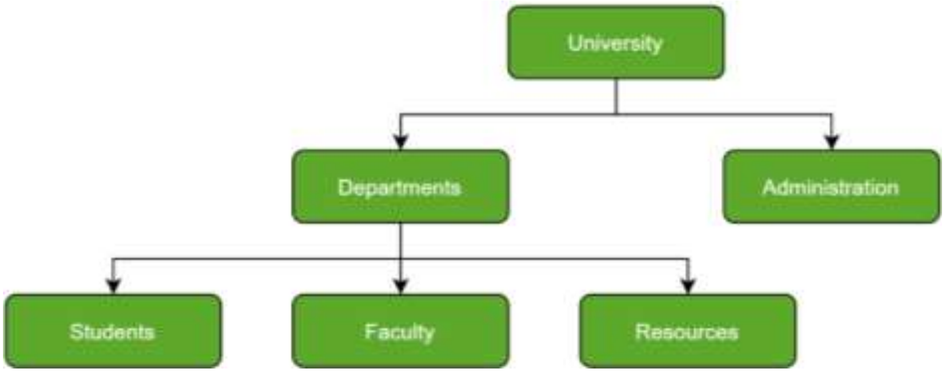

Fig 2. Hierarchical Database

Network Database: By enabling child records to be connected to several parent records, network databases expand on the hierarchical model and produce a web-like structure of linked data. As a result, entities can be joined in a variety of ways to create a more adaptable structure known as a graph model.

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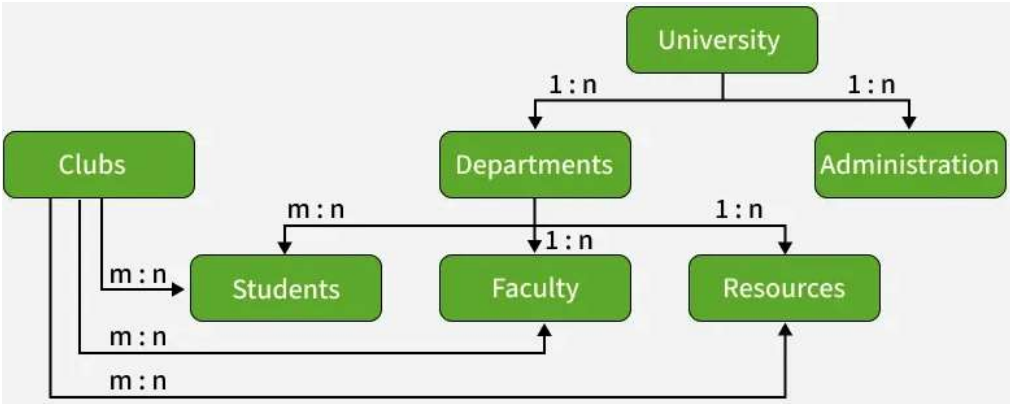

Fig 3. Network Database

Object-oriented Database: Data is saved as objects in object-oriented databases, which are founded on the ideas of object-oriented programming (OOP). These objects are simple to refer to and work with since they have methods (functions) and attributes (data). Large files, multimedia, and graphics are examples of complicated data structures that these databases are made to handle.

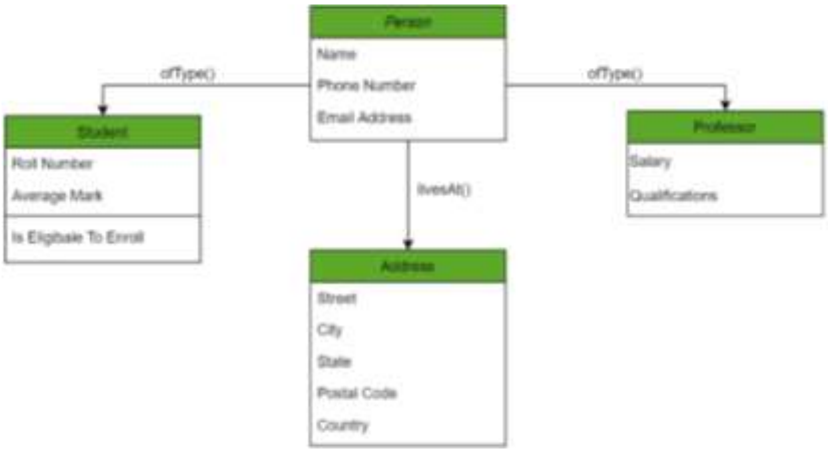

Fig 4. Object-Oriented Database

Relational Database: Nowadays, relational databases are the most popular kind of database. They keep data in tables, where records are represented by rows and their properties by columns. Every item of information in these databases is related to every other piece of information. This is because each data value in the database has a distinct identity in the form of a record. Keep in mind that this model has all the data tabulated. As a result, a primary key is used to link each row of data in the database to another row. Similarly, a foreign key is used to link each table to another table. Look at the diagram below to see how two tables are linked using the notion of "Keys." Tables have grown incredibly popular because of this introduction to data organisation. As a result, they are frequently incorporated into Web-App interfaces to act as perfect user data repositories. Because the language used to communicate with the database—in this case, SQL is straightforward to understand, it is even more fascinating. Compared to hierarchical databases, scaling and data traversal are relatively easy tasks in relational databases. For example, popular relational databases include MySQL, PostgreSQL, and Oracle.

Roll no.	Student Name	Marks Awarded
1	Raman Triphati	86
2	Rajan Govindan	94
3	Mahesh Nandalal	94

Key = 94

Marks Awarded	Student Name	Rank	Scholarship
94	Rajan Govindan	17	Yes
94	Mahesh Nandlal	16	Yes

Section	Student Name	Marks Awarded	Rank
A	Raman Tripathi	86	43
B	Rajan Govindan	94	17
C	Mahesh Nandlal	94	16

Fig.5 Relational Database

Cloud Database: A cloud database runs on cloud computing platforms in a virtual environment. It offers flexibility and scalability for data management, execution, and storage over the internet. Applications that demand dynamic workloads frequently employ cloud databases since they do not require on-premises infrastructure. SaaS (Software as a Service) and PaaS (Platform as a Service), which streamline database operations for companies, are popular cloud services for database access and management. Among the well-known cloud service providers are Web Services by Amazon (AWS) GCP, or Google Cloud Platform, Microsoft ScienceSoft, Azure, etc.

Centralised Database or Centralised Information Systems: A centralised database is kept and maintained in one place, such as a data centre or central server. Because all data is kept in one location, it guarantees greater security and consistency and facilitates control and management. To retrieve or change data, users can access the database from a distance. In business systems where data security and consistency are crucial, centralised databases are frequently utilised. However, performance constraints and scalability should be properly taken into account. Example: NDLI Library/University Library/Institutional Library.

Personal or Private or individual Databases: Usually used on personal computers or mobile devices, a personal database is a small-scale database created for a single user. These databases are perfect for handling personal information such as notes, schedules, budgets, and contacts. Non-technical individuals can use them since they are lightweight, simple to use, and need little database administration. As an example, Microsoft Access: A straightforward database option for small businesses or home use. SQLite: A self-contained, lightweight database that is frequently utilised in desktop and mobile apps.

Operational Database: The purpose of an operational database is to handle and process real-time data for everyday commercial and organisational operations. It makes it possible for users to easily add, edit, and remove data, guaranteeing that the database accurately represents recent transactions and activity. These databases offer fast access to current data and manage real-time transactions. SAP HANA is an operational database that is utilised for analytics and fast transactions.

NoSQL Database: NoSQL databases (short for "non-SQL" or "non-relational") offer an alternative to conventional table-based relational models for data storage and retrieval. Rather, it is perfect for managing unstructured, semi-structured, and structured data since it makes use of versatile data models such as key-value pairs, documents, column families, or graphs. NoSQL databases are renowned for their high availability, horizontal scalability, and ease of design. In some use cases, their data architectures provide speedier operations than relational databases. One popular document-based NoSQL database is MongoDB.

Document Database repositories: Instead of using rows and columns to describe data, document databases, also called document stores, or local repositories, use documents that resemble JSON. Document databases, sometimes known as document-oriented databases, are made to store and handle document-oriented data, also known as semi-structured data. Document databases are helpful for mobile apps that require quick iterations since they are straightforward and scalable.

Graph Database: NoSQL databases built on graph theory are known as graph databases. Software for Graph-Oriented Database Management Systems (DBMS) is made to recognise and manipulate the relationships between data items. As a result, graph databases are frequently used to examine the connections between disparate data points, such as in fraud prevention or social media customer data mining.

Time Series Databases: A database designed for time-stamped, or time series, data is called a time series database. Network data, sensor data, and application performance monitoring data are a few instances of this kind of data. A steady stream of time series data is produced by all the Internet of Things sensors that are being affixed to everything. Examples: InfluxDB, eXtremeDB, and Druid

Key-value Databases, which store data as a collection of key-value pairs composed of two data items each, are among the most basic kinds of NoSQL databases. They are occasionally called key-value stores as well. Key-value databases are perfect for tasks like session management for web applications, user sessions for large multiplayer online games, and online shopping carts because they are extremely scalable and capable of handling large volumes of trafficRe dis, Amazon DynamoDB, etc.

Wide or broad column databases: Sometimes referred to as broad column stores, don't depend on the schema. Instead of using rows and columns to hold data, column families are used. Wide column databases that are highly scalable and capable of handling petabytes of data are perfect for enabling real-time big data applications. Examples are Scylla, BigTable, and Apache Cassandra.

Research Data Registry:
A "one-stop shop" for registering all kinds of research studies, systematic reviews, and meta-analyses is the Research Registry(www.researchregistry.com). The WHO data set serves as the foundation for the data we gather, along with a few more items. Our goal is to modify this resource to meet user demands. A registry is a structured system for gathering, storing, retrieving, analysing, and sharing data on specific individuals who have either a specific illness, a condition (such as a risk factor) that makes a health-related event more likely to occur, or past substance exposure.

The fastest growing global research registry in the world in the global research registry have Over 8,500 registered studies, 30 million patients from 100+ countries.

Research Data Repository:
Using a research data repository is the most effective way to publish and distribute research findings. An online database known as a repository enables the preservation of research material throughout time and facilitates its access by others. In addition to storing research material, a repository will give each uploaded item a DOI and offer a webpage explaining what it is, how to cite it, and how many times it has been accessed or cited by other researchers.

Types of Research Data Repository:
FigShare: Researchers can conserve and make discoverable their research outputs, including datasets, photos, and videos, via Figshare, an open access data repository. Figshare gives citations a digital object identification (DOI) and enables scholars to add files in any format. In January 2011, Mark Hahnel founded Figshare. The platform was initially created by Hahnel as a personal tool for arranging and disseminating the results of his stem cell biology PhD. This system is currently used by over 50 universities. Every year, Figshare publishes "The State of Open Data" to evaluate how the academic environment surrounding open research is evolving. Up to 5GB of files can be uploaded to free Figshare accounts, which also offer 20GB of free storage (Walport 2011[28]).

Mendeley: Researchers can store and exchange their data in Mendeley Data, an open research data repository. Datasets can be exchanged both publicly and privately with one another. The goal of Mendeley is to make data sharing easier. According to them, "science gains when study data is made publicly available: The results can be confirmed and replicated, and the data can be applied in novel ways. Finding pertinent research is much easier. funders receive greater returns on their investment. After being posted to Mendeley Data, datasets are examined during the moderation process. This guarantees that the information is scientific, comprises research data, and is free of already published research articles. Mendeley Data allows researchers to upload and store their work for free (Foster 2017[29]).

Dryad: Dryad is a carefully selected general-purpose repository that enables data to be found, freely reused, and cited. Most file formats, including compressed archives of several files, can be provided, including text, spreadsheets, video, photos, and software code. There are no entry fees for individual users or institutions because one of Dryad's guiding principles is to make its materials freely available for research and educational purposes. Rather, each time data is published, Dryad charges a $120 US fee to fund its operations[30].

Harvard: Scientists can save, exchange, reference, and examine research data using Harvard Dataverse, an online data repository. The open-source online application Dataverse, created by Harvard's Institute of Quantitative Social Science, powers the Harvard Dataverse repository. Institutions, journals, and researchers have the option of using Harvard's installation or setting up the Dataverse web application on their own server. All scientific data from all fields is welcome in the Harvard Dataverse[31]. There are a 2.5 GB file and 10 GB dataset limit on Harvard Dataverse, which is free.

Open Science Forum: To assist researchers in recording the lifecycle of their projects and archiving information, OSF is a free, open-source research management and collaboration application. The nonprofit Centre for Open Science is responsible for its construction and upkeep. To facilitate sharing and encourage attribution, each user, project, component, and file is assigned a distinct, persistent universal resource location (URL). If a project is made publicly accessible, it may also be given a digital object identifier (DOI)[32].

Zenodo: Zenodo is a general-purpose open-access repository run by CERN that was created as part of the European OpenAIRE program.Initially known as the OpenAire orphan records repository, Zenodo was founded to offer open scientific compliance to researchers without an institutional repository, regardless of their field, funding source, or country. By making research outputs private, Zenodo encourages users to upload them early in their study lifetime. Datasets are automatically made public after a related publication is published. Researchers can submit any kind of file to Zenodo, and datasets up to 50 GB are accepted[33].

Database Applications in the Real World:

The majority of contemporary applications employ databases, whether they are on our computers, phones, or the internet. A large portion of the data required for an application to run will be stored in an operational database system, which will also keep the data organised and make it accessible to users. The following types of data would be accessed and stored in the operational database system if an e-commerce application were developed: Customer information, such as email addresses, usernames, preferences, and more. Business data, such as product attributes, costs, ratings, reviews, and so forth. Relationship data: several goods can be viewed by a customer and vice versa.

Fig 6 Real-world Database Applications

DISCUSSION AND RESULT

Discussion: The execution of ***Ukraine's*** National Open Science Plan (Cabinet of Ministers of Ukraine, 2022)[2] and proposed changes to the Ukrainian Law "On Scientific and Technical Activities," which deal with support for young scientists and research infrastructure (Verkhovna Rada of Ukraine, 2023)[6]. Furthermore, methodological suggestions on research data management for universities and scientific organisations are currently being prepared by the Ukrainian Ministry of Education and Science.

Kenya's economy relies heavily on agriculture, which also contributes significantly to the country's food security and job growth. The national research system and the agricultural sector are linked in the Kenyan government's revitalisation policy (Kenya, Republic of: Ministry of Agriculture, Livestock, and Fisheries, 2010; Kenya, Republic of, National Development Plan, 2002-2008). The Kenya Agricultural and Livestock Research Act No.17 of 2013, an Act of Parliament, created KALRO to oversee agricultural research throughout the nation (KALRO, 2016). The Kenya Agricultural and Livestock Research Act No. 17 of 2013 does not specify how research data produced by research institutes should be handled to guarantee its long-term access, preservation, sharing, and reuse (Emily et al 2024)[10].

Research Data Curation (RDC) has advanced significantly in the ***United States of America (USA), Canada, Australia, and the United Kingdom*** (UK) (Henty, 2014[11]; Lewis, 2010[12]; National Science Foundation (NSF), 2007[13]). When the United Kingdom (UK) Data Archives was founded more than 40 years ago in Europe to handle paper-based surveys and other data outputs, extensive curation of research data began to take shape. The expansion of digital research and the increased desire for long-term preservation, curation, and storage of research data for reuse have stimulated RDC in research libraries. The National Science and Technology Council Committee in the United States (US) and the e-Infrastructure Reflection Group in the European Union were established to offer advice on capability, capacity, and infrastructure in data curation as a result of the growth of digital research and the emergence of data-intensive and collaborative research (van den Eynden et al., 2011)[14]. Investment in data management has increased because of these improvements (Lewis, 2010[12]). For instance, through the DataNet program, the US National Science Foundation (NSF) has provided RDC with funding and cyber-infrastructure (NSF, 2007[13]). Additionally, Australia has established the Australian National Data Services (ANDS) and developed e-research data curation rather quickly (ANDS Technical Working Group, 2007[15]).

According to Deventer and Piennar (2015[16]), South Africa is at the forefront of the group of African nations adopting research data curation. The Data Intensive Research Initiative of South Africa (DIRISA) is one of the programs designed to advance RDM in the nation by easing research data curation, according to Lötter (2014[17]) and Fernihough (2011[18]). Limited efforts are being made in Kenya to advance RDM through data curation, particularly in the health and migration sectors (Jao et al., 2015[19]; Olum, 2013[20]).

The International Livestock Research Institute (ILRI) and the International Centre of Insect Physiology and Ecology (ICIPE) have established a communications and knowledge management unit and a data management, modelling, and geo-information unit, respectively, to guarantee that research outputs from the research activities are arranged, curated, managed, and made publicly available to a broad audience (Alila & Atieno, 2006[21]).

Result

1. Digital transformation's impact on the effectiveness of research. By simplifying project administration, lowering administrative costs, and guaranteeing regulatory compliance, the use of a centralised digital platform greatly increased efficiency. Before implementation, research teams worked in silos, which resulted in redundant work and inefficient data access. By offering a consistent and organised workflow for all parties involved, RDBMS resolved these problems (Jannet[39] 2025).
2. Difficulties in coordinating stakeholder interests: Reconciling the disparate goals of different departments was one of the biggest obstacles to execution. Administrative teams were more focused on data security, compliance, and financial supervision, whereas clinical researchers gave priority to trial design and simplicity of data entry. FMUP was able to reduce resistance to change and promote adoption by incorporating all important stakeholders early in the decision-making process (Saurav 2025[40]).
3. Interoperability and data integration: The platform's success depended heavily on its smooth connection with electronic health records. To improve the accuracy and dependability of research, it was crucial to make sure that patient data from various sources could be coordinated and safely handled. While protecting patient privacy, RDBMS's compatibility with current hospital and research databases increased data accessibility.
4. Financial and regulatory obstacles: Because the project was publicly funded, it had to adhere to strict EU financing standards, which called for careful financial monitoring and open reporting. Future large-scale research digitisation projects will have a roadmap thanks to the knowledge acquired in handling these compliance issues.
5. Impact on clinical research innovation and scalability: RDBMS has optimised ongoing research programs and set the stage for future research endeavours by offering real-time analytics and performance tracking. A culture of data-driven research has been fostered by the capacity to provide thorough data reports, which have enhanced decision-making and resource allocation.
6. This study emphasises how crucial it is to implement research management platforms for Research Database Management Systems with strategic planning, stakeholder participation, and technical adaptation. Other organisations looking to digitise their educational, public self-help awareness and growth, agricultural and scientific research, and national development processes for prospects might use the lessons learnt from the Digital initiative as a guide.

Suggestions and Recommendations

1. The respective state/central government authorities of the universities take on challenges, and the responsibility for addressing these challenges (in both the short and long term) is likely to fall on institutional repositories (Cox & Pinfield, 2014)[36].

2. Central and state government and autonomous bodies integrated into one platform to develop an integrated DBMS for educational purposes.
3. Research centres and public health departments integrated into one platform to develop an integrated DBMS for Research and development purposes.
4. All Schools, Teaching and Learning centres, polytechnics, and technical institutions are integrated into one platform for supplying knowledge resources from one DBMS.
5. All government departments and state public service departments are integrated into one platform and developed a DBMS.
6. All transports are integrated into one platform to supply and fulfil public services.

Mitigation and Challenges:

Libraries may use the following tactics to lessen these difficulties:

1. Create institutional rules that satisfy funding agency standards and international open science regulations.

2. Make investments in digital infrastructure by working with technology companies and utilising cloud-based storage options.

3. To improve data management abilities, provide capacity-building programs for researchers and librarians.

4. Encourage interdisciplinary cooperation so that institutions can exchange best practices and expertise.

5. Promote incentives for researchers that actively contribute to open data efforts, such as research credits, funding perks, or career recognition.

Innovative Ideas for the Future of AI Changes in Library Administration:

These innovations and ideas are suggested by the author in his thoughts, and he defines the past development of library administrative life cycles and suggests his innovation of the data transformation in the worldwide library based on his expertise and experiences are going to develop within the 2035 with this blue taxonomy integrated with AI and robotic technological developments as to be develop in future prospectives are given below

Manual Circulation to Automated Circulation
Manual Visual Search to Machine Voice Search
Manual Vision Reading to Automatic Machine Reading
Manual Data Search to Automated Voice Data Search
Manual Recognition to Optical Recognition
Manual Identification to Image Identification
Physical Monitoring to Auto monitoring
Physical Tracking Search to Machine Robotic Tracking
Manual Selving to Robotic Selving
Self-Checking to Signal-based Checking.
Manual Assistant to Machine Chatbot Assistant
Manual Resource Management to Electronic Resource Management
Manual Document Delivery to Electronic Document Delivery
Automated to AI Algorithm-based management
Static Information to Cloud-based Transformation of Information.
Manual Sharing to Blockchain Sharing Technology

Virtual Reality to Augmented Reality
Manual Security Detection to Camera Security Fraud Detection

University Database Schema:
Schema diagrams can show a database schema as well as primary key and foreign key dependencies. The schema diagram for our university organisation is displayed in these figures. Every relation is shown as a box with the attributes listed inside and the relation’s name at the top in blue. The primary key characteristics are highlighted. Arrows connecting the foreign key properties of the referencing relation to the referenced relation's main key indicate foreign key dependencies.

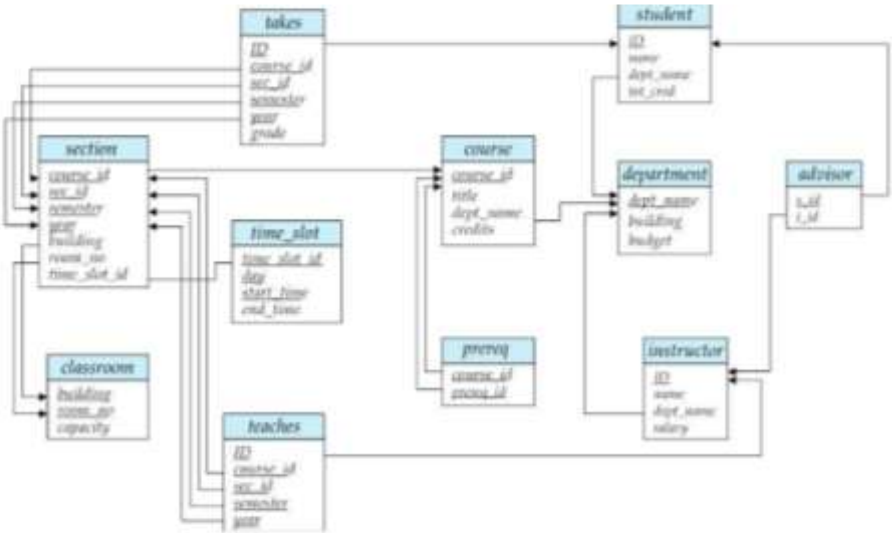

Fig.7. Schema Diagram for University Database

Universal Database Schema Diagram:
In order to join a formal universal database, the state and federal governments must take action to combine the databases of all universities and other higher education institutions into a single platform and issue a legal government order. In order to spread the data from one primary hub to another, we already have good network facilities in every state, including government databases, schools, universities, research centres, publishing firms, medical centres, and research centres. Example: INFLIBNET centre, through this information and library networks, all universities and educational institutions' libraries are connected and share their data with all users based on their demand. It will connect in future and be a world's number one database in the world.

All Indian Universities in India (Indian/foreign), Research Centres (Teaching/Medical/Technical/Agriculture etc.), All Schools and Boards, Public Departments, All Transport, Health Services/Social Services/Religious Services/Community Services, etc. State and Union Government, Media and Publications, Data Delivery Centers & All Libraries Digital Curation Centres, Digital Forums and Networking Agencies, Professional Bodies and International Trading Agencies etc. etc. are connected through the INFLIBNET centre and NDLIS.

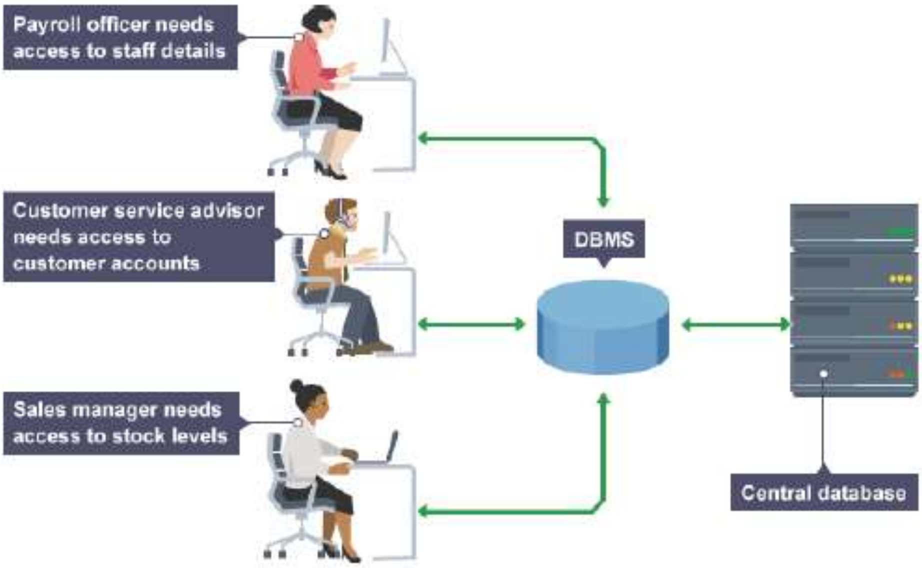

Fig.8 Users accessing Data through DBMS. Source[38]

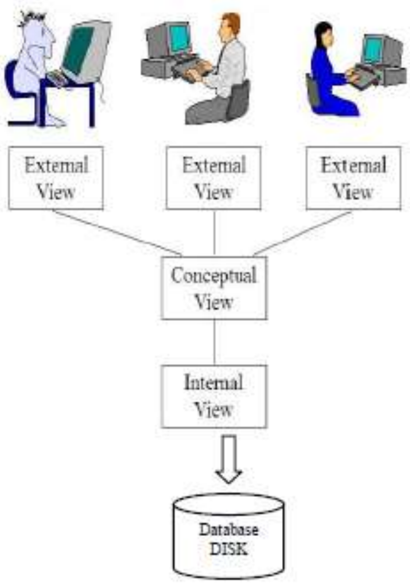

Fig 9 User accessing data for various purposes from different Places

Advantages of AI Adoption:

Integrating AI and other technologies in the RDM poses several difficulties.

Data Privacy: Handle private and sensitive information in accordance with privacy regulations like GDPR.

Algorithm Bias: An AI system can remove biases from training data, which can produce biased outcomes.

Technical infrastructure: Not all libraries have the tools or know-how to use cutting-edge technologies.

Skill Difference: To stay up with the quickly evolving technologies, librarians need ongoing training.
Stability: An administrative and financial commitment is necessary for the long-term upkeep of a tech-based RDM system.
Effective Data Access: In a database system, the DBMS is in charge of managing the data, and all access to the data is made possible by the DBMS, which is essential for efficient data processing.
Standards Enforcement: DBA can create and implement data standards, such as naming conventions and data quality standards, because to the centralisation of data.
Data Independence: In a database system, the application programs and data are interfaced by the database management system. The metadata that the DBMS obtains is altered when the data representation is modified, but the DBMS still supplies the data to the application program in the same manner. When necessary, the DBMs take care of the data transformation process.
Reduced Maintenance and Application Development Time: DBMSs enable several crucial features that are shared by numerous applications, such as data access, which speeds up application development.

CONCLUSION

Artificial intelligence (AI) presents both enormous benefits and equally important challenges for library administration and automation. AI is improving library administration, efficiency, user experience, and resource management. Future advancements in library automation promise even more innovations through robotics, blockchain, IoT, VR/AR, and artificial intelligence. It is obvious that artificial intelligence will always have an impact on the direction of information services as libraries embark on this journey, directing them towards ever-changing relevance, efficiency, and accessibility. Artificial intelligence (AI) offers several benefits and has revolutionary effects on library management, enhancing user experience and operational efficacy. Many parts of library management can be automated and made simpler by artificial intelligence technologies. Artificial intelligence can help libraries become more dynamic and user-centred, creating a more engaging and accessible learning environment.

Research data can enhance our knowledge, save lives, and aid in the development of remedies. The first step in lessening the burden of lost research is to encourage cooperation and collaboration among a worldwide research community. Despite the concerning problem of research data waste, which costs billions of euros annually, there is hope for the future. Journals, funders, and academic institutions are under pressure to make data sharing mandatory to lessen the cost of unnecessary research. With this collection of essays on data sharing, we wish to illuminate the way for several researchers who are considering the advantages of making their data publicly available. Researchers may maximise the value of their work and preserve datasets across time by using the six research data repositories discussed in this article.

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Consent: By global guidelines for public requirements, public awareness in global education and research and development, and smart education systems, the author has gathered and kept all the information himself.

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