

# Establishment and Nationalization of Innovative Repository in Kenya: A Collaborative Approach to Scholarly Data Management.

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## ABSTRACT

This paper investigates the establishment and nationalization of innovative academic repositories in Kenya. It argues for collaborative efforts of the key stakeholders such as academic institutions, private organizations, and government departments that can be leveraged to create a centralized repository that hosts publications, books, videos, audio, research papers, academic journals, copyrights, innovative ideas, sustainability models, and discoveries.

The methodology employed in this research is Literature Review of secondary sources. This involved systematically gathering and synthesizing previous research to identify challenges in accessing scholarly resources and collaborative approaches to establish a comprehensive repository. The study showed that the benefits of establishing a comprehensive repository include enhanced access, data preservation, and increased collaboration. The paper also acknowledges potential challenges such as limited technology access, and financial constraints, and suggests strategies that curb these challenges to ensure the repository's success and sustainability.

In conclusion, a centralized repository in the country will improve the sharing of knowledge, enhance Kenya's global position in the intellectual space, and attract multinational collaborations, that will stimulate socio-economic development. The key recommendations include promoting collaboration among stakeholders, making the system user-friendly and secure, and formulating regulatory frameworks to ensure security.

## INTRODUCTION

A repository is a location or a place where important materials like data or documents are stored. An academic repository is a location (online or otherwise), where academic documents and other scholarly materials like a thesis, books, dissertations, research papers, academic journals, reports, policy papers, etc., are stored (Charlesworth Author Services). Similarly, an innovation repository is where innovative ideas, creative concepts, business models, sustainability solutions, and breakthrough projects are stored (YUKTI-National Innovation Repository). Academic and innovation repositories are collections of information, data, and documents that may be retrieved and used by students, researchers, professionals, public and commercial institutions, and organizations seeking knowledge in many sectors.

The 21st century is characterized by very rapid developments in skills, the exchange of knowledge as well and the spread of this technical expertise to a wider global community. This has become extremely vital in enhancing and promoting the advancement of academic research, discoveries, and innovations (Robinson, Yu, Zeller & Felten 2008). In the regions where it is quite challenging to access scholarly resources such as books, research publications, or even data as is commonly experienced in most countries in Africa, deliberate investments must be put in place for the establishment and nationalization of a centralized innovative academic repository. The establishment and nationalization of an innovative academic repository in Kenya would be a hallmark achievement that would demonstrate the country's commitment to becoming

a regional hub in research and innovation. The established repository would contribute immensely towards easy access and a more rapid exchange of ideas that can lead to increased innovation and academic growth in the country.

Universities, scholars, and researchers in the country have been making tremendous contributions in various academic disciplines and this has led to a remarkable growth in Kenya's global position in the world of knowledge and innovation. Research and innovation sectors have exponentially grown by benefiting from the country's scholars, the product of which has been numerous academic publications, research papers, books, countless innovations, etc. (Micheni, Wechuli, Murumba & Machii 2021). Unfortunately, while relentless progress is being made in the country's body of knowledge, the same progress cannot be said of the accessibility and management of those scholarly materials. The lack of a nationalized innovative academic repository has limited the ability of academics and researchers to collaborate and share scholarly data or information, thus obstructing the country's potential to optimally utilize its knowledge base (Ratanya 2017). Students, professors, researchers, innovators, and policymakers in Kenya continue to face challenges in accessing scholarly materials of their peers that can assist them in exploiting creative ideas discovered by other experts and that have denied them the foundation upon which to base their ideological and intellectual discoveries and inventions. This frustrates collaborative efforts that could be leveraged to inspire consistent intellectual progress in general.

The challenges mentioned above justify the need for one database or storage where the diverse but widely fragmented scholarly and innovative materials can be stored and easily accessed by all interested parties. A comprehensive repository in Kenya will provide easy access to researchers and innovators by creating a single source of information and data from diverse disciplines (Ogenga 2015). The repository will, by extension, enhance the free flow of knowledge and ideas for increased intellectual and technical development. The goal of this research paper is to address the inaccessibility of scholarly resources and data, by recommending stakeholder collaboration of university academics, government departments, research institutions, and international organizations, to establish a nationalized innovative academic repository in Kenya. Collaboration by the stakeholders will enable a complementary approach that empowers each partner to contribute resources in a more sustainable way that ensures the repository built can fully support the research ecosystem and act as a comprehensive hub for all scholarly data in different disciplines.

## LITERATURE REVIEW

The efficient sharing and preservation of research resources, publications, reports, and innovations has greatly increased in the last 3 decades. This is due to technological advancements such as widespread internet coverage, increased access to computers, and most recently the invention of smartphones (Nandi et al, 2016). Repositories, especially centralized repositories, have increasingly become popular and useful as a single platform that provides all the information, data, and innovative concepts (Pinfield et al., 2014). Such repositories are used by students, academic institutions, researchers, and government departments dealing in policy formulation, to influence growth and development in different sectors.

Consequently, different partners and stakeholders interested in intellectual developments and having the same vision can take collaborative approaches to achieve these developments together (Al-Hawamdeh, 2003). Shepard (2013) comments that collaborations provide opportunities for participants to pool human and financial resources to achieve joint goals. It enables various bodies and people to consult, exchange, and distribute information gained from the depository's various contents to encourage intellectual growth, foster discoveries, and invent innovative solutions to global concerns.

Additionally, comprehensive repositories play a pivotal role in this century of advanced technology by providing several benefits to various stakeholders such as policymakers, universities, and researchers. One

of the key benefits of the repository is the ease of access which makes it very convenient for any interested party to use. Repositories serve as a one-stop hub, aggregating an extensive array of information, according to Van Westrienen & Lynch (2005). Most repositories host data spanning concerns of critical importance, groundbreaking innovations, technological insights, and a plethora of scholarly materials, including research papers, journal articles, reports, and books (Lucas et al., 2013). The centralization of knowledge within these repositories is invaluable, providing a panoramic view of academic achievements and developments (Crow 2006). The single platform scenario encourages more informed decisions made by policymakers, promotes better research by scholars, and empowers researchers (Lavis, Posada, Haines & Osei 2004). Moreover, the existence of such centralized repositories enhances the visibility and recognition of authors, leading to increased citation rates by peers within the academic community (Swan, 2005). Perhaps most significantly, these repositories promote the discoverability and shareability of information and data, transcending the confines of individual institutions and disciplines (Jerome 2019). This interconnectedness encourages collaboration and exchange resulting in more progress in research.

Collaboration among diverse academic, research, governmental, and non-governmental groups has resulted in the establishment of centralized innovative academic repositories in several other nations and continents. Collaboration between these organizations and entities allows them to share responsibilities in terms of resources, skills, and experiences to ensure continuous improvement of the repository (Babu, Kumar, Shewale, & Singh 2012). According to Shepard (2013), collaborative projects allow the collaborators to assign staff with the relevant expertise to perform each task. Additionally, a collaborative approach contributes to the sustainability of the repository by overcoming barriers that would otherwise be caused by individual disjointed efforts (Babu, Kumar, Shewale, & Singh 2012). Collaboration brings together different entities, each playing a unique role that collectively leads to the realization of a common goal, which would promote the establishment of a centralized repository.

One of the main benefits of collaborative projects is pooling human resources to develop a workflow to accomplish the various tasks to complete the project (Shepard, 2013). Academic institutions contribute by providing academic materials such as research papers, theses, peer-reviewed journals, etc., as well as the necessary expertise, skills, and experience that is necessary to continuously refresh and improve the repository (Ogenga 2015). Researchers engaging in experiments contribute to the wealth of knowledge in the repository by way of their discoveries and inventions (Schafer et al., 2016). They also provide practical solutions that explore the application of the knowledge obtained from scholarly materials to advance the economy and tackle real-world challenges. On the other hand, government agencies contribute through resource mobilization and formulation of policy regulations (Chan, Kwok & Yip, 2005). The government would additionally be responsible for providing experience and expertise in the development of the repository infrastructure and data management policies that promote further innovations. According to Babu, Kumar, Shewale, and Singh (2012), the regulatory framework set up by the government plays a key role in ensuring the security of the proprietary resources hosted in the repository.

These are some examples of centralized repositories:

- Europe PMC was founded by several partner organizations whose goal is to ensure the free availability of biological data to the scientific community. The repository contains research papers/reports, academic journals, books, and preprints that are accessible to all individuals and organizations who are interested (Ferguson et al., 2021). Europe PMC provides a platform for easy exchange of knowledge, thereby empowering researchers, academics, and other scholars to be in touch with the latest developments. This encourages collaboration between different organizations and inspires further discoveries in science.
- The China National Gene Bank was founded to support research and innovation in life science, preservation, and archiving of bioresource data (Guo et al., 2020). The centralized repository was

established through extensive collaborations between the Chinese government departments, several research institutions, and international partners that had a common interest in the advancement and preservation of life sciences.

- National Repository of Open Educational Resources hosted in India. The repository was created by a collaboration between the Ministry of Human Resource Development, the Ministry of Education, and the national government (Khan, 2015). It hosts several primary and secondary classes' educational resources.
- Digital Public Library of America was established in 2010 to develop a network of digital collections across the United States (Shepard, 2013). The repository was established through a vast collaboration between libraries, museums, and cultural institutions to preserve and facilitate ease of access to digital resources like manuscripts, scrolls, books, photographs, videos, and cultural artifacts.

Setting up a centralized repository creates unlimited opportunities for individuals, organizations, and government departments to develop further in terms of research, education, and innovativeness of the different sectors of the economy. Individuals can leverage existing knowledge to develop new ideas, forge collaboration with others, and easily disseminate their findings to influence new ideas and the development of policy (Chan, Kwok & Yip, 2005). Discoveries, established data, and findings are made easily and openly available to enhance further research more transparently, hence providing more resources to learners, educators, and researchers. Importantly, understanding that a centralized repository furthers education, research, collaboration, and innovation, provides a strong justification for the need to collaboratively establish a centralized repository and its nationalization in Kenya.

The opportunity to adopt modern technologies that exploit digital capabilities and the widespread of systems that are open access enabled have stimulated a real potential for developing states to embark on this transformative journey (Braunschweig, Eberius, Thiele, & Lehner 2012). Leveraging these advancements, this research paper explores Kenya's potential and the best practices required for the successful establishment of a nationalized innovative academic repository.

## METHODOLOGY

The research method used in this study is a Literature Review of secondary sources, which involves a systematic collection and synthesizing of the previous relevant research. The process involved systematic gathering, organizing, analyzing, and synthesizing of the existing scholarly works, research reports, articles, peer-reviewed journals, publications, and books. The resources were those that are relevant to the establishment of a comprehensive academic repository and the collaborations that can be exploited by stakeholders for its successful establishment.

The research began with a search for relevant literature that addresses the key concepts in the study i.e., showed the challenges faced by Kenya's academics, researchers, and policymakers in accessing scholarly resources and data, the benefits that would be realized if the repository is established and the stakeholder collaboration needed to establish a nationalized academic repository to improve that access.

The quality, validity, and relevance of these sources were then evaluated and reviewed to determine their ability to provide a wide range of insights and valuable perspectives for this paper. The selected sources were then organized and analyzed to establish existing patterns, contradictions, and challenges faced by those in the intellectual landscape in terms of access and utilization of academic resources and data. The diverse insights gained from these sources of literature provided a clearer understanding of collaborative approaches toward the establishment and nationalization of a centralized academic and innovation repository in Kenya.

## FINDINGS

The findings of this research highlight the several benefits to the country's intellectual growth and the potential impacts that would be realized from the establishment of an innovative academic repository in Kenya. These include enhanced access to scholarly materials, preservation of intellectual resources, increased collaboration among various stakeholders, and the potential for global recognition and partnerships. However, the paper also acknowledges potential challenges such as limited technology access, financial constraints, and the need for standardized regulations to ensure the repository's success and sustainability.

### **The Benefits and Impact of Innovative Academic Repository**

The establishment of a comprehensive repository and its nationalization in the country is expected to induce certain benefits.

To begin with, a comprehensive repository ensures well-organized and easily accessible scholarly materials and innovative ideas that can be explored and exploited by students, educators, and researchers for increased research and socio-economic development. Jain (2011) comments that, the provision of a full range of academic and research materials as well as support services including e-mail-print requests, and closed access deposits to the repository to serve academia and researchers is essential for a centralized repository to actualize and succeed in its objectives.

Additionally, nationalization and establishment of a centralized repository contribute to the preservation of the country's intellectual resources produced by its professionals, experts, policymakers, and researchers (Pinfield et al., 2014). The safeguards put in place ensure that these resources can be used in the long haul for the furtherance of the country's socio-economic growth.

The establishment and nationalization of a centralized repository provide access for authors to disseminate their scholarly materials to make them more discoverable and available to other scholars and researchers, at no cost to those interested in exploring such academic resources (Jain, 2012). This encourages more access to a wealth of knowledge that expectedly inspires more research, discoveries, and general intellectual developments in the country.

Furthermore, setting up a centralized repository in the country would promote collaboration between different entities in the country such as universities, researchers, non-governmental organizations, and government departments. According to Shepard (2013) and Jain (2012), collaboration encourages the dissemination of knowledge, and sharing of findings, skills, innovations, and discoveries thus contributing to further innovation, research, and growth in different sectors of the economy such as education, health, agriculture, and national security.

Finally, a nationalized academic and innovation repository in the country acts as a library for holding scholarly resources and innovative ideas and concepts as well as a showcase of the country's rich intellectual and innovative capacity (Saini 2018). This raises the intellectual standing of the country globally and attracts global partners willing to collaborate with government departments in progressive projects in research and academia. Such collaborations attract funding for technological transfer and investments that wouldn't otherwise be invested in the country. The overall outcome of this level of exposure to the country's knowledge depth and heritage is that it is likely to stimulate unprecedented socio-economic and intellectual development.

### **Challenges to the Establishment of Innovative Academic Repository and Mitigation Strategies**

The establishment and implementation of a centralized repository and its nationalization in the country may

very likely be faced with certain challenges that would hinder its success in terms of accessibility, use, security, and sustainability.

Firstly, the participation of the community at large in accessing academic resources like research papers, publications, and books, and innovative ideas like sustainability ideas, discoveries, etc., may be affected by limited access to technology and poor network coverage in some parts of the country (Oteri, Kibet, & Ndung'u 2015). The proposed strategy to overcome this challenge is to provide offline access to scholarly resources and innovation ideas and forge partnerships with local stakeholders to provide training in the use of digital platforms to access resources.

Secondly, due to the limited financial capacity of Kenya, which is a developing economy, the establishment of a centralized repository that hosts such a huge set of data and information is likely to attract high costs of managing and maintaining the database. As Pinfield et al (2014) comment, low levels of infrastructure provision in areas such as Africa and Central Asia, for example, may reasonably be assumed to be significant barriers to repository development. Using open-source systems that do not attract huge subscription fees is one way of overcoming this challenge. Jain (2011) suggests that there must be adequate provision of resources such as finance, space, human, and technology, by the collaborating partners, to ensure the success and sustainability of the repository.

Finally, the collaborative efforts may be undermined by the standards of resources that are not consistent due to validity issues and data security challenges. To circumvent these challenges, the government, which is one of the collaborative partners, should formulate standardized regulations that govern the quality of academic or innovative materials that can be incorporated into the repository as well as efficient access controls to ensure the safety of proprietary information.

## CONCLUSION

Access to academic materials such as research papers, publications, peer-reviewed journals, books, and innovation ideas such as medical discoveries, technological innovations, new business models, and sustainability concepts, among others, have been grossly limited in Kenya (Ratanya 2017). Ratanya (2017) comments that researchers, university professionals, students, and government agencies that are interested in exploring, exploiting, and citing these scholarly materials in the course of their work, are not able to access them easily or reliably. The inaccessibility of these materials on account of fragmentation and lack of a single source of data calls for the establishment of a centralized repository and its nationalization.

The development of a centralized academic and innovation repository in Kenya is achievable when different individuals, organizations, and government departments work together, each occupying its unique space and playing a specific role. The collaboration recommended in this paper will play a huge role in setting up the repository, thereby mitigating challenges faced by students, educators, researchers, and policymakers, in accessing scholarly resources and innovation ideas.

The repository will not only advance academic and innovative frontiers in the country but will also propel Kenya toward a more dynamic intellectual future. The repository will improve the dissemination and sharing of knowledge by students, scholars, and policymakers. It will also enhance Kenya's global position in the intellectual space, attract multinational collaborations, and promote positive transformation in the country, thus stimulating socio-economic and technological development.

## RECOMMENDATIONS

Kenya should implement the following recommendations to establish and nationalize an innovative academic repository that not only addresses the challenges of access to scholarly resources and data but also

promotes collaboration, dissemination of knowledge, and socio-economic development in the country.

### **Stakeholder Collaboration and Partnerships**

Kenya must embrace a very elaborate collaborative plan among various stakeholders, including academic institutions, private organizations, government departments, and international organizations to successfully establish and nationalize an innovative academic repository. The roles, responsibilities, and contributions of each partner in the collaborative team must be clearly defined to foster a culture of cooperation. This will ensure not only a consistent but also a sustainable routine of sharing resources to support the repository's ongoing development.

### **Open-Source and Cost-Efficient Solutions**

Kenya must adopt an open-source technology and embrace cost-efficient solutions for its repository development and maintenance. This is because the country is still a developing economy that is grappling with very limited financial resources and technical expertise. An open-source system will save the country huge expenses on licensing and subscription fees.

### **Digital Literacy and Inclusivity**

The paper proposes the provision of offline access to the repository to give academics, researchers, or even policymakers the ability to explore scholarly materials and data offline. This is because certain regions in Kenya, especially remote places like Arid and Semi-Arid regions of the country, have very limited network coverage and consequently poor internet access. The stakeholders must also engage grassroots organizations and academic institutions to train people in basic digital literacy skills to empower them to use the system.

### **Data Quality Assurance and Security**

The paper recommends government collaboration to come up with strict policies and laws that will govern system security to protect the information that is held in the repository from misuse and wrongful distribution. These include cybersecurity laws and quality regulations that ensure that any materials posted to the repository are verified and validated.

### **User-Friendly Interface and Accessibility**

Finally, the paper recommends that the repository system established must be easy to use, simple to navigate, and filter-enabled to make it easy for any user to access the scholarly materials they need quickly and accurately.

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