Ipea’s Knowledge Repository

Fábio Ferreira Batista, Ph.D1, Veruska da Silva Costa2

1 Instituto de Pesquisa Econômica Aplicada - Ipea, Brasília, Brazil
2 Instituto de Pesquisa Econômica Aplicada – Ipea, Brasília, Brazil

fabio.batista@ipea.gov.br
Veruska.costa@ipea.gov.br

Abstract

The Institute for Applied Economic Research, or Instituto de Pesquisa Econômica Aplicada (Ipea), as it is known in Brazil, is a public foundation linked to the Brazilian Presidency. Its research activities aid the government in planning and implementing public policies.

Ipea’s Knowledge Repository (RCIpea) is a very useful KM initiative that allows users inside and outside the organization to access the institute’s intellectual capital. The repository is an online portal designed to preserve and manage the institute’s organizational memory. RCIpea contains more than documents (a document management system), data (database), or records (a record management system). It also contains valuable knowledge comprised of the combination of the organization’s tacit and explicit knowledge based on Ipea’s researchers’ unique experiences in terms of conducting social studies research.

Researchers’ tacit knowledge has been stored in the repository through videos where researchers share their own lessons learned and best practices.

The RCIpea allowed the institute to make explicit part of the researchers’ tacit knowledge. Today, the institute’s tacit and explicit knowledge are organized and stored in a structured way. Moreover, this knowledge can now be disseminated using patterns of international interoperability, allowing internal and external access to Ipea’s knowledgebase.

The implementation of RCIpea shows that it is possible to implement a KM framework, a KM method, and a KM practice in an integrated way. The KM Framework for the Brazilian Public Administration designed by Fábio Ferreira Batista is the foundational theory, developed through a literature review covering KM frameworks in the public sector (Batista, 2012). Following this decision, a KM Plan was draft based on an implementation method for that purpose. The main focus was the implementation of a repository to eliminate knowledge gaps and to improve organizational performance.

1. Introduction

The Institute for Applied Economic Research (Ipea) sees Knowledge Management as an integrated method to create, share, and apply knowledge to improve organizational performance. In other words, KM is not an end in itself. Its implementation should bring results for the Institute’s employees and managers, as well as to Brazilian citizens by allowing Ipea, a public sector organization, to fulfill its mission.

In 2012, Ipea decided to adopt a KM Framework designed specifically for the Brazilian public sector (Batista, 2012).
The first KM framework component: the importance of KM strategy alignment with the organization’s strategic planning to ensure KM initiatives will contribute toward the fulfillment of the organization’s strategic objectives. Public sector organizations should answer the following questions, in this order: First: what is our mission? Second: how are we going to achieve our vision, in terms of the kind of organization we want to be ten, fifteen, or twenty years from now? Third: what core knowledge or core competencies do our employees and managers require to achieve our strategic objectives and goals. Only after asking these questions should organizations ask how knowledge should be managed to fulfill its mission and reach its vision. Therefore, KM initiatives should help organizations achieve its strategic objectives in order to be considered an important approach.

KM success factors or enablers are the second framework component, which include leadership, technology, people, and processes.

Leadership in a successful KM implementation effort ensures that KM projects are aligned with organizational strategic goals and that these will improve performance, and provides the necessary resources (financial, technological, and human).

Technology is also an important enabler. Information technology and communication tools help organizations better manage knowledge processes (knowledge identification, creation, storage, sharing, and application).

People play the most important role in KM implementation, as they are responsible for all knowledge processes. Moreover, they own the organization’s most valuable intangible asset: tacit knowledge. Therefore, KM initiatives should focus on individual learning to improve employee performance, thereby improving team and organizational performance.

Finally, processes play an essential role in KM because the way organizations manage knowledge in managing processes is a decisive factor for performance improvement.

The third framework component is the KM process. There are five essential activities in the KM process to effectively manage knowledge to reach the organization’s objectives: identification, creation, storage, sharing, and application of knowledge. These activities should be an essential part of project and process management. In 2009, Ipea adopted the KM operational cycle shown in Figure 1, where knowledge is managed as a regular activity in project and process management.

The KDCA Cycle has four stages. The KM plan is designed in the first stage: Knowledge (K). Employees are trained, a KM plan is implemented, and data and information are collected in the second stage, Do (D). The third stage, Check (C), is the moment to check if the quality goals were achieved and if the KM plan was implemented as planned. Finally, if the goal was not met or there were mistakes during the KM implementation process activities (knowledge identification, creation, storage, sharing, and application) should be fixed during the fourth stage, Act (A). If it was, then the knowledge should be stored in the Knowledge Repository to later reuse.
The KM outcomes comprise the fifth framework component. KM implementation should result in both intermediate and final outcomes. The intermediate results include learning and innovation, and thus enhance individual, team, organizational, and social capacity to identify, create, store, share, and apply knowledge. Intermediate outcomes should enable organizations to reach the final outcomes: enhanced efficiency, higher quality and effectiveness, and an improved capacity to fulfill the constitutional principles of Brazilian public administration (legality, impersonality, morality, and transparency) and promoting development.

Stakeholders are the final KM framework component, and include citizens and society overall. All public sector organizations should manage knowledge about citizens to fulfill their mission and meet society’s needs and expectations about the quality of public services.

Figure 2 illustrates the KM Framework for Brazilian Public Administration.

2. Designing a Successful KM Strategy and Plan

In 2012, Ipea designed their KM strategy and plan in seven steps, based on Ipea’s KM Framework described in the introduction. The first step is to identify a major knowledge problem. In the previous year, a KM team assessed Ipea’s information and knowledge needs and found that the leadership as well as senior and junior researchers complained about the
difficulty in getting the right information and knowledge to the right people at the right time within the organization. Although all papers, reports, and books were stored in the organization’s portal, researchers reported that they were not easy to find. Therefore, it was clear to the KM team that solving the problem required some kind of knowledgebase as the portal was not a suitable place to store information and knowledge that researchers need in their daily tasks.

The second stage was to establish a KM vision: “Researchers can access key explicit and tacit knowledge to learn from before implementing research projects, that is, accessing and applying existing knowledge, to learn during the project and continuously access that knowledge, and to learn after, either validating or renewing the knowledge stored in the organization, to improve Ipea’s performance.” This vision is aligned with Ipea’s KM Operational Cycle shown in Figure 1.

Based on this vision, the team established the KM goal in the third: “To make available, both internally and externally, and with fast access, key explicit and tacit knowledge produced by Ipea’s researchers, consultants, and visiting scholars.” In the fourth stage, the team defined the KM Strategy: “To identify, organize, store, and disseminate for quick access, use, and reuse, key explicit and tacit knowledge produced internally to improve Ipea’s performance.”

Figure 2 – KM Framework for the Brazilian Public Administration

Metrics were established in the fifth step to monitor KM’s strategy results: 1) Percentage of key tacit and explicit knowledge identified, organized, stored, and disseminated internally and externally; 2) Researchers’ satisfaction with access to information and knowledge needed to implement projects; 3) Researchers’ satisfaction with research project outcomes as a result of the KM initiative. The sixth step was to design and implement a KM Plan for Ipea’s KM Repository of the key tacit and explicit knowledge the organization produces. Finally, the seventh step was to continually monitor and assess the KM plan to determine if the KM goal is being achieved.

3. Implementation of Ipea’s Knowledge Repository

3.1 Introduction to the nature of the KM initiative and its specific objectives

Ipea’s knowledge repository is recognized as a KM practice in the organization. From its initial implementation in 2012, its main goal was to solve a knowledge problem detected in a KM assessment completed in 2011. The knowledge produced by Ipea’s researchers was not captured, represented, organized, and stored in a way that allows quick access and use by both the researchers and outside stakeholders (government officials and public employees, citizens, private companies, unions, research institutes, universities, and so on).

For research institutions, repositories are now considered a KM practice and a strategic tool to enhance visibility. Repositories allow knowledge dissemination in scientific and technical communities (Costa and Leite, 2006).

The repository’s specific objectives were: to allow users inside and outside the organization to access the institute’s intellectual capital; to preserve and manage the institute’s organizational memory; to contain more than documents (a document management system), data (database), or records (a record management system) but also the valuable knowledge comprised of the combination of the organization’s tacit and explicit knowledge based on Ipea’s researchers’ unique experiences in terms of conducting social studies research; to store researchers’ tacit knowledge through videos where researchers share their own lessons learned and best practices; to make explicit part of the researchers’ tacit knowledge; to organize and store in a structured way the institute’s tacit and explicit knowledge; and to disseminate knowledge using patterns of international interoperability, allowing internal and external access to Ipea’s knowledgebase.

Ipea’s repository has several features: search tools; search by topic; communities and collections; browse by author, subject, and date; browse by type; and storytelling videos, as shown in Figures 3 - 7.
- **Search tool:**

Figure 3 – Search tool

![Search tool](http://repositorio.ipea.gov.br/)


- **Search by topic:**

Figure 4 – Search by topic

![Search by topic](http://repositorio.ipea.gov.br/)


- **Communities and collections:** 1) public administration, government, and state; 2) agriculture, livestock, and fishery; 3) food and nutrition; 4) science, research, methodology, and data analysis; 5) international trade; 6) domestic trade; 7) international cooperation and international relations; 8) demography and population; 9) regional development; 10) social development; 11) law and legislation; 12) economy and economic development; 13) education; 14) employment and labor; 15) energy; 16) housing; 17) industry; 18) environment and natural resources; 19) small, medium, and large companies; 20) social security; 21) sanitation; 22) health; 23) monetary system, finance, and banking; 24) tax
system; 25) society, social participation, and social control; 26) technology, innovation, information, and knowledge; 27) third sector, services, and tourism; and 28) transportation.

**Figure 5 – Communities and collections**

![Image of Communities and Collections](http://repositorio.ipea.gov.br/)

**Browse by issue date, author, title, subject, and type**

**Figure 6 – Browse by author, subject, and date**

![Image of Browse by Author, Subject, and Date](http://repositorio.ipea.gov.br/)
Figure 7– Browse by type

- **Storytelling videos**, in which Ipea’s researchers share lessons learned during research projects and describe the impact of Ipea’s papers on public policy formation and implementation, are important objects in the repository as they preserve organizational memory. The repository also includes videos with Ipea’s managers, wherein they share lessons learned, and best practices in process management.

Figure 8 – Storytelling videos

Source: http://repositorio.ipea.gov.br/

3.2 The infrastructure (people, system, hardware, software) required to launch the initiative

The Knowledge Repository was implemented by a multidisciplinary team from diverse areas including: the KM Unit, Project Management Office, Library Division, Information Technology (IT) Department, Communication Division, and Research Departments. The repository’s implementation effort was led by the KM team and sponsored by the head of the Institutional Development Department, which assured financial resources in addition to the personnel and consultants required to successfully implement the project.

The participation of a multidisciplinary team in the repository design and implementation provided the necessary support, collaboration, and involvement of Ipea’s key stakeholders (Batista and Costa, 2013).

The repository implementation was also made possible by the work of a team of experts with extensive expertise in the following issues: Dspace software, information architecture, domain study, metadata definition (Dublin Core), repository flows, access policy and copyrights, metadata filling, software installation and customization, and visual identity, among others.

The chosen software, Dspace, was developed by the Massachusetts Institute of Technology (MIT) and the company Hewlett-Packard (HP).
DSpace was chosen because it: 1) has the largest community of users and developers worldwide; 2) is free and open source software; 3) is completely customizable to fit Ipea’s needs; and 4) is used by educational, government, private, and commercial institutions worldwide, including: Harvard University, MIT, Yale University, Princeton University, Johns Hopkins University, George Washington University, the University of Cambridge, Georgetown University, São Paulo University (Brazil), and Brasilia University (Brazil), among others; 5) can be installed out of the box; and 6) can manage and preserve all types of digital content.

The minimum necessary requirements were employed: the Linux Operational System, Java JDK 1.7+, Maven 3+, Tomcat 7+, Ant 1.7+, and PostgreSQL 9.x+. Moreover, the project used the following initial infrastructure: four Entraı Processing Units, four GB of RAM memory, and 500 GB of disk space.

3.3 The challenges that were encountered, how they developed and how they were overcome

There were challenges encountered related to technology, people, and processes. Ipea’s IT department was not familiar with the Dspace software, a critical problem because IT support is essential for the repository’s successful implementation. To overcome this obstacle, an outside expert was hired to both provide assistance in the project implementation and share knowledge with the IT team.

Another challenge was the fact that the Library Division’s employees were not familiar with the repository’s implementation. Although all were highly experienced in librarian services, none were familiar with knowledge repositories. This was overcome by hiring a repository expert to join the KM team to provide guidelines and training to the Library Division’s personnel and all employees involved in the project. Another challenge was to clarify the roles for all areas involved in the repository’s implementation and management. This was accomplished by issuing of an ordinance signed by Ipea’s president with the description of all tasks to be performed by every stakeholder.

3.4 How the initiative was received by the users and participants

The KM initiative was well received by Ipea’s researchers because it eventually helped them in their daily research activities by improving knowledge access and use. External stakeholders also welcomed the KM practice for the same reasons. However, Library Division’s team, one of the most important participants of the KM initiative, presented some resistance in the beginning because they saw the KM Unit initiative as a threat since they did not have a leading role in its implementation and management. The leadership commitment to the project and efforts by the KM Unit team demonstrated the important role the Library Division was going to play in the repository’s implementation and management.

3.5 The efficiency, effectiveness outcomes that were achieved and how they were measured and evaluated

This case history collected the following data covering the main indicators Ipea used to measure and evaluate the Knowledge Repository, covering the period from January 2012 to April 2015:

- Total items published: 2,775;
- Number of storytelling videos: 10;
- Percentage of Ipea’s most important publication, “Text for Discussion,” published in the repository: 2.056 (100%);
- Percentage of the most important series of books published by Ipea (“Brazil in Development” and “Brazil: The State of the Union”) added to the repository: 100%;
- Number of countries that accessed the repository: 120;
- Number of cities that accessed the repository: 2.245;
- Number of continents that accessed the repository: 6;

From January 2013 to December 2014, the following results were found:

- Viewed items: 842,868;
- Viewed collections: 260,528;
- Users’ Logins: 4,175;
- Number of searches: 44,256

4. Plans to further develop the initiative

The following projects and activities are planned for implementation in the next three years to further develop the repository:

- **Federation of Repositories for Development.** This KM initiative will gather the intellectual production of several Brazilian research organizations dedicated to development issues. Ipea’s repository will be the first to join the Federation, making available its OAI-PMH Interface;
- **Lessons Learned System.** The tacit knowledge of Ipea’s experts about lessons learned in research projects will be captured in workshops, and organized and stored in the repository for internal and external dissemination;
- **Best Practice System.** The tacit knowledge of best research practices and methods used by Ipea’s researchers will be captured in workshops, and organized and stored accordingly.
- **Storytelling in the Repository.** Ipea will continue to capture its researchers’ tacit knowledge by recording their stories and including these in the Knowledge repository.
- **User satisfaction survey.** A satisfaction survey will be conducted in September 2015 to understand Ipea’s researchers’ level of satisfaction with the knowledge repository and to gather employees’ opinions about how to improve the KM initiative.
- **Ipea’s Expert Yellow Pages linked to the Knowledge Repository.** A Yellow Pages directory linked to the repository’s objects will be implemented using metadata.

Ipea’s knowledge repository has helped the organization reach the KM goal established in 2012. Researcher’s tacit and explicit knowledge have been stored, little by little, in the repository and their fast access is now possible for both internal and external stakeholders. The leadership and the KM team are aware that Ipea is on the right track to build a comprehensive knowledge base, including all or nearly all of the organization’s essential knowledge. However, it is also clear that this is just the beginning of a continuous process.

**References:**

