ASSESSMENT OF THE MATURITY OF KNOWLEDGE MANAGEMENT OF THE DEAN OF AN EDUCATIONAL INSTITUTION: A CASE STUDY

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Resumo: *A gestão do conhecimento (GC) torna-se um elemento essencial às organizações. Por isto, este trabalho objetivou diagnosticar o nível de maturidade do sistema de gestão do conhecimento da unidade central administrativa de um instituto federal de educação no Brasil, e relatar como este diagnóstico pode contribuir para a inovação sustentável. Realizamos o diagnóstico da maturidade adaptando o modelo da APO (Asian Productivity Organization), que baseia-se nos critérios: liderança em GC, processo, pessoas, tecnologia, processos de conhecimento, aprendizagem e inovação e resultados da GC. Verificamos que os pontos fortes da instituição estão nas áreas de tecnologia e liderança, mas há oportunidades de melhoria principalmente quanto aos resultados de GC e processos de conhecimento. No âmbito geral, a instituição encontra-se no estágio de iniciação da escala de maturidade da APO.*

Palavras-chave: Gestão do Conhecimento; Análise de Maturidade; Relato de experiência; Inovação; Instituto Federal de Educação.

Abstract: *Knowledge management (KM) becomes an essential element for organizations, whether public or private. For this reason, this work aimed to diagnose the level of maturity of the knowledge management system of the central administrative unit of a federal institute of education, in Brazil, and to report how this diagnosis can contribute to sustainable innovation. We performed the maturity diagnosis by adapting the APO (Asian Productivity Organization) model, which is based on the criteria: leadership in KM, process, people, technology, knowledge processes, learning and innovation and KM results. We verified that the institution's strengths are in the areas of technology and leadership, but there are opportunities for improvement mainly in terms of KM results and knowledge processes. In general terms, the institution is in the initiation stage of the APO maturity scale.*

Keywords: knowledge management; maturity analysis; experience report; innovation; Federal Institute of Education.

Resumen: *La gestión del conocimiento (GC) se convierte en un elemento esencial para las organizaciones, ya sean públicas o privadas. Por esta razón, este trabajo tuvo como objetivo diagnosticar el nivel de madurez del sistema de gestión del conocimiento de la unidad administrativa central de un instituto federal de educación, en Brasil, y relatar cómo este diagnóstico puede contribuir a la innovación sostenible. Realizamos el diagnóstico de madurez*

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adaptando el modelo APO (Asian Productivity Organization), el cual se basa en los criterios: liderazgo en GC, proceso, personas, tecnología, procesos de conocimiento, aprendizaje e innovación y resultados de GC. Verificamos que las fortalezas de la institución están en las áreas de tecnología y liderazgo, pero existen oportunidades de mejora principalmente en términos de resultados de GC y procesos de conocimiento. En términos generales, la institución se encuentra en la etapa de iniciación de la escala de madurez APO.

Palabras clave: conocimiento administrativo; análisis de madurez; informe de experiencia; innovación; Instituto Federal de Educación.

1 INTRODUCTION

The Knowledge Society emerges driven by changes in technological transformations in companies, digital transformation, and access to the network in society (Fernández-Rovira, 2021). This society is characterized by the intensive use of information, the creation of content on different platforms, and the distribution, manipulation, and integration of this diverse information in digital media.

With such a large volume of data, it is necessary to process it and classify what is useful and what is not, what needs to be stored, and how to do it. Processes and flows for performing activities and accessing information need to be created. It is here that an area of study called Knowledge Management (KM) stands out, which according to O'Leary (1998, p.34) consists of "Formal knowledge management to facilitate the creation, access, and reuse of knowledge, usually with the use of information technology".

In Public Service, KM is defined by Batista et al. (2005), as "a set of systematized, articulated and intentional processes, capable of increasing the ability of public managers to create, collect, organize, transfer and share strategic information and knowledge that can serve for decision-making, for the management of public policies and for the inclusion of the citizen as a producer of collective knowledge".

To analyze KM in institutions, maturity models were developed, which according to Kraemer et al. (2017) are representations that initially emerged in software engineering to represent "the development stages of a company for process implementation". Hartono et al. (2019) demonstrate the relationship between KM Maturity and Business Performance, where the higher the maturity, the higher the business performance.

Identifying the KM maturity level in an institution is important not only to understand the processes and areas in which the company needs to endorse efforts to achieve greater maturity and stability but is also related to its innovative capacity (Giugliani, 2018).

Valdati et al. (2018) establish the relationship between knowledge management maturity and innovation, presenting KM maturity models focused on Innovation. Thus, it is possible to perceive the importance of analyzing the maturity models of organizations, since maturity directly influences the innovative capacity of the business and, consequently, companies, whether public or private, that manage to innovate recurrently, remain competitive in the market.

Thus, the objective of this study was to diagnose the level of maturity of the knowledge management system of the central administrative unit of a federal educational institution in the State of Mato Grosso, Brazil, the Federal Institute of Education, Science, and Technology of Mato Grosso (IFMT).

2 THE INFRASTRUCTURE

The context of the research is the central administrative unit, Rectory of the IFMT which is responsible for the financial and process management of the 19 units of the organization, as well as for defining institutional policies, establishing guidelines, and institutional priorities, constructed in a dialogic way with the entire internal community (Federal Institute of Education, Science, and Technology of Mato Grosso, 2023).

The institute was created pursuant to Law nº 11,892 (Brazil, 2008), of December 29, 2008, through the integration of the CEFET-MT, CEFET-Cuiaba, and the Federal Agrotechnical School of Cáceres. The IFMT is an institution of higher, basic, and professional education, multicampus, specialized in offering professional and technological education in different teaching modalities. Linked to the Ministry of Education, it has the legal nature of an autarchy, with administrative, patrimonial, financial, didactic-pedagogical, and disciplinary autonomy. Currently (Federal Institute of Education, Science, and Technology of Mato Grosso, 2023) it has 14 campuses and five sub-campuses in operation, totaling approximately 25,000 students in more than 100 courses.

The diagnosis was carried out considering the model proposed by the ASIAN PRODUCTIVITY ORGANIZATION (APO, 2009), with the adaptation of the instrument model proposed by Batista (2012 and 2015), aimed at the evaluation of knowledge management in the scope of public administration, as well as adaptations made to the context of this study. The study sought to identify the current stage of knowledge management maturity in that unit, in order to find strengths and opportunities for improvement for the organization to develop, always seeking to innovate to remain sustainable.

3 THE CHALLENGES

The first challenge of this case study was to find collaborators who had not only organizational knowledge, and managerial experience, since the investigated phenomenon is within the context of their reality (Yin, 2015), but also mastery of terms and concepts of knowledge management to understand and better answer the form used.

Data collection was carried out through documental bibliographic analysis, in addition to observation and application of a form (APO, 2009, adapted) to carry out the assessment of the maturity level of the knowledge management system in the organization.

Thus, the two participating subjects occupied the functions of Extension Program Managers (Management) and one of the participants also accumulated the function of Substitute Pro-Rector of Extension (Governance), considered sufficient due to the accessibility to institutional data, experience and experience in the context and by the function exercised in the studied organizational unit.

In Chart 1, the data referring to the profile characteristics of the research participants are arranged, such as role, age, education, time at the organization (IFMT), and time working in the researched unit (Rectorate of the IFMT).

Table 1- Characterization of the Participating Subjects

Role	**Code**	**Gender**	**Age**	**Education**	**Time at the organization**	**Time working in the researched**
Program Manager	Participant 1	M	33	Master Degree	7 years	2 years
Program Manager	Participant 2	F	32	Master Degree	10 years	6 years

Source: Survey data (2022)

The second challenge was regarding the use of the tool in the context of the IFMT, since some terms were not practicable for the organization or were obsolete with the current facts.

Thus, the use of the tool took into account the adaptation of the instrument model proposed by Batista (2012 and 2015) as well as adaptations to the context of this study, carried out by the authors. The choice of instrument was due to its use (after adaptations) aimed at evaluating knowledge management within public administration (Batista, 2012 and 2015).

4 HOW THE INITIATIVE WAS RECEIVED BY THE USERS OR PARTICIPANTS

As data collection was carried out considering the necessary adaptations of the tool and the choice of participants, there were no objections on the part of the interviewees and the forms were applied with fluidity.

As for the institution's governance, the initiative was received with enthusiasm, and as a result of this work, we hope that the maturity diagnosis carried out will serve as feedback to the rectory to act on the points of improvement in relation to maturity and rethink institutional innovation strategies and metrics, including to align them with the institution's strategic objectives.

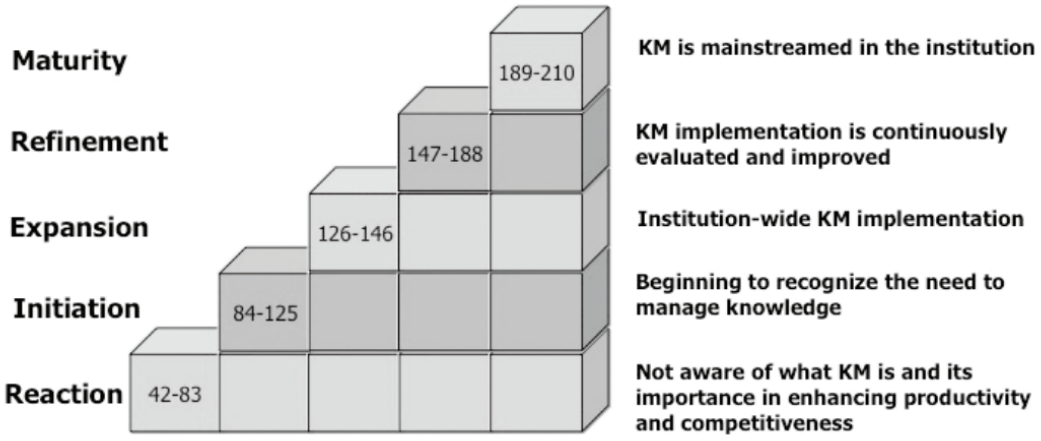
5 THE LEARNING OUTCOMES

The use of that instrument (APO, 2009) enabled the analysis in relation to the seven criteria: leadership in knowledge management; process; people; technology; knowledge process; learning and innovation; and results of knowledge management. Each of the criteria has six statements, totaling 42 sentences to be evaluated on a scale of 1 to 5, as described:

1. The described actions are very poorly performed, or not performed at all.
2. The actions described are poorly performed.
3. The actions described are carried out properly.
4. The actions described are well performed.
5. The actions described are very well performed.

Thus, the maximum score for each criterion is 30 points and the maximum sum score for all criteria is 210. Based on the sum of the scores for the seven criteria, the organization is classified according to the maturity level of its customer management system knowledge on a five-stage scale, as shown in Figure 1:

Figure 1. Maturity levels of knowledge management in the APO model.



Source: APO (2009)

After applying the forms, we averaged the scores for each criterion to obtain the final grade (Table 2), which represents the scores of the organization in relation to the maturity of the knowledge management system. This table compares the maximum scores for each criterion and the score obtained by the organization.

In the average of the answers obtained with the questionnaires, the total score of 102 points was reached (Table 2). Considering Figure 1 of this article, this value indicates that the maturity level of the knowledge management system of the Rectory of IFMT is initiation (score from 84 to 125) (APO, 2009). This level of maturity is low, but indicates a recognition of the organization's need for knowledge management.

Table 2- Maturity level of the IFMT Rectory's KM system - General score

Criteria	Maximum punctuation	Punctuation Participant 1	Punctuation Participant 2	Final Punctuation	Ranking
Leadership in KM	30	15	19	17	2º
Process	30	12	16	14	5º
People	30	15	15	15	4º
Technology	30	24	26	25	1º
Knowledge process	30	7	9	8	6º
Learning and innovation	30	10	8	16	3º
Results of KM	30	6	8	7	7º
Total	**210**	**89**	**101**	**102**	**-**

Source: Survey data (2022). Elaborated by the authors.

The final score of the criteria was ranked to better understand the strengths and criteria that can be focused on to improve the organization's KM.

There is a higher average score for the **technology** criterion (25 points), with a considerable difference for the second-place **leader in GC** (17 points). The criteria **leadership in KM** (17), **process** (14), **people** (15) and **learning and innovation** (16), obtained similar scores, varying in only three points, 14 to 17. The most unfavorable highlights were the criteria **results of GC** (7) and **knowledge process** (8) that had the lowest scores.

Similar results were found in the works of Calmeto and Cribb (2022), who analyzed a Distance Learning unit of the Instituto Federal Fluminense (IFF) and in the work of Petri (2019), who analyzed the KM maturity in Department of Institutional Development of the Federal Institute of Santa Catarina (IFSC). The result corroborates the assessment of maturity in several

federal institutes (Balbino; Nunes; Queiroz, 2016), whose attention is more focused on the highest-scoring criteria in this study.

Considering the analysis of the results obtained in this research, Table 3 represents the summary of the strengths and opportunities for improvement in the knowledge management system of the Rectory of IFMT.

Table 3- Organizational KM Strengths and Improvement Opportunities Matrix.

Criteria	Strengths	Improvement Opportunities
Leadership in KM	There is an innovation and intellectual property policy, as well as a responsible sector. There is a specific sector (Pro-Rectory of People Management) that maps the knowledge that employees need to acquire in order for them to carry out their activities.	Establish organizational knowledge management strategy. Recognize and reward employees knowledge sharing.
Process	An annual management report is prepared with measurable indicators.	Improve the alignment of the middle and final processes with the mission and vision of the organization.
People	Groups of employees are formed to work on projects. There is a clear policy to encourage qualification (knowledge creation).	Encourage, organize, systematize and value the sharing of knowledge.
Technology	There is a centralized technological infrastructure available to all employees.	Break with the "do it by yourself" culture to demonstrate competence. Encourage search for data, information and knowledge in the repository.
Knowledge process	not applicable	Map existing knowledge and encourage sharing.
Learning and innovation	Groups of employees are formed to work on projects and in critical situations.	Encourage employees to take risks and learn from mistakes as part of the learning process.
Results of KM	not applicable	Make the institution be aware of what KM is and the importance of it. Deploy a KM system. Implement a system to recognize existing KM actions, proposing new ones based on a proposal for institutional change.

Source: Elaborated by the authors.

Considering the results found here regarding the technological infrastructure, as well as the similar results of Vasconcelos (2016), concluding that Brazilian public organizations

already have conditions, tools and accessories regarding the information technology structure, and considering the rapid advancement of technology, an adaptation of the tool proposed by APO (2009) is suggested. Items such as the intranet network could be replaced by cloud storage solutions, which is currently the case with IFMT. In the past, the institution's management systems were accessible only via the intranet, but they have been replaced by web systems, accessible from anywhere with a connection, also helping to modernize and implement remote work.

6 PLANS TO FURTHER DEVELOP THE INITIATIVE

By diagnosing the level of maturity, pointing out weaknesses and opportunities for improvement, we contribute to the organization with a beacon in the actions to be focused on so that it develops, and also with science, making it possible to compare with other departments of federal institutes, about 40 currently.

As a result of this work, we hope that the maturity diagnosis carried out will serve as feedback to the organization, so that they can act on the points of improvement in relation to maturity and rethink the strategies and metrics of institutional innovation, including to align them to the strategic objectives of the institution.

We also suggest as future research that a knowledge management system be proposed for the Rectory of IFMT, with the objective of institutionalizing knowledge management.

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