

# Knowledge Management Practices and the Evolution of Healthcare Organizations Based on a Certification Program

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**Abstract:** Quality certification programs are internationally recognized processes for externally assessing and improving quality, resolution, and sustainability in healthcare organizations. In these organizations, knowledge is a strategic intangible asset. Concurrently, knowledge management (KM), through its practices and tools, promotes the use of organizational knowledge, and can help transform knowledge into action in the dynamic, systemic, competitive, and demanding environment faced by such organizations. In this context, this study aims to analyze the association between strategic KM practices and the evolution of certified health organizations by measuring the evolution of quality descriptors implemented during participation in the certification program. The research adopts a quantitative approach, with a descriptive-exploratory nature, and follows a cross-sectional design. Presented here are concepts relative to the theme and constructs that support the analysis proposed in this study. For data collection, two instruments were used. The first is related to the evolution of companies participating in a certification program, and the second is a questionnaire designed to identify knowledge management practices developed within the companies. The study was developed in 24 healthcare companies in Brazil that participated in a certification program. The results identify an association between KM practices and the level of evolution of certified healthcare organizations. The companies have in common the incentive to share knowledge in the workplace, as well as providing continuous training opportunities. There is an observed need for organizations to effectively communicate their strategic objectives and develop financial incentives and career development based on knowledge. The results confirm the relationship between KM practices and the evolution of healthcare organizations.

**Keywords:** Healthcare organization, Physiotherapy services, Certification/accreditation, Quality assurance, Knowledge management practices

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## 1. Introduction

Healthcare organizations offer differentiated services that demand singular answers to constant unexpected events, and that face challenges to provide assistance that delivers safety to the end user, resoluteness and generation of value, a competitive advantage, sustainability, and growth for companies (Nicklin, Engel and Stewart, 2021; Bernardino, 2017).

The COVID pandemic abruptly showed us the importance of health care systems, their complexity and the need for adapting and reorganizing the system as a whole – end users, service providers, financiers, clients, governments, academic institutions and so on (Zimlichman *et al.*, 2021).

Sustainable societies need to consider the connection between knowledge management (KM) and healthcare to be a critical issue for social development with safety for the patient (Karamitri, Kitsios and Talias, 2020). The authors affirm that the sustainability of healthcare organizations depend on the efficient use of knowledge assets and resources. It is necessary to investigate how knowledge permeates the structures of a healthcare organization, identifying possible knowledge sharing predictors that may support the KM strategy of a healthcare company (Nicklin *et al.*, 2017).

Quality certifications are internationally recognized external evaluation programs based on the premise that adhering to preestablished standards and compliance will produce better quality healthcare services in an increasingly safer environment. They are also a way to publicly recognize that a healthcare organization meets national standards of quality (Pomey, 2004).

Michell, Graham and Nicklin (2020), understand that the certification is a tool for translating implementation knowledge or intervention, which aims to improve and increase assimilation of evidence within healthcare organizations while emphasizing knowledge to promote action.

According to Darroch (2005), KM would act as a coordination mechanism within organizations, allowing resources to be efficiently used, promoting interaction, and fomenting improved organizational capacity. It is seen as a coordination mechanism that allows resources to be converted into abilities (Nelson; Winter, 1982). These coordination mechanisms are supported by KM practices, oriented to adequately manage knowledge, aiming at its efficient use and in line with organizational objectives and tasks (Kianto and Andreeva, 2014; Cen, 2004; Dávila *et al.*, 2014).

In view of this context, this study will use concepts of quality certification, knowledge management and its practices, while aiming to identify the association of KM practices with the level of evolution of certified healthcare organizations, within a certification program.

## **2. Theoretical Foundation**

### **2.1 Certification**

Pomey et al. (2010), define certification as a rigorous process of external evaluation which comprehends a self-evaluation, as well as external evaluations according to a certain set of standards. The authors believe that certification processes help introduce organizational changes that improve the quality and safety of service. These changes vary according to organizational context, and the process of certification is a highly effective tool to: 1. accelerate integration and foment a spirit of cooperation within healthcare organizations; 2. help introduce continuous quality improvement programs for recently certified organizations or those not yet certified; 3. create new leadership for quality improvement initiatives; 4. increase social capital, giving collaborators the opportunity to develop relationships, and 5. promote connection among healthcare organizations and other areas.

Guaranteeing updated processes that allow for patient safety is related to quality management in organizations that are based on future-oriented strategies, geared towards society, dynamic and human-centered, especially when performing procedures that decrease risk and waste, and boost the management of continuous improvement in a dynamic, fast, accelerated and often unknown environment (Braithwaite et al., 2020; Greenfield and Braithwaite, 2008; Nicklin, 2015; Nicklin, Engel and Stewart, 2021; Nonaka and Takeuchi, 2021; Zimlichman et al., 2021). According to Novaes (2015), certification programs represent a method that facilitates the development of standards for continuous improvement of patient care and organizational performance.

Within the context of healthcare organizations that provide services, quality certification programs are a vehicle to disseminate learning, effectiveness, and efficiency, to present evidence of their processes and, with that, enable the translation of knowledge within the organizational environment (Nicklin, Engel and Stewart, 2021). Mitchell, Graham and Nicklin (2020) state that, even though quality certification programs are widely recognized, especially for improving organizational performance, researchers provoke the assumption that the true value of a certification process lies in its contribution to safety and quality of healthcare as a means to stimulate and support knowledge for action, a key value for certification which has not yet been articulated. "[...] it is a form of knowledge translation (KT) or implementation intervention that aims to improve and increase the input of evidence in healthcare organizations". (Mitchell, Graham and Nicklin, 2020, p. 445).

### **2.2 Knowledge Management**

For Peter Drucker (1993, p. 42), the knowledge which we consider knowledge is proven in action. This refers to knowledge as efficient information towards action, and information with a focus on results. These are described as results which are outside the person, in society and in the economy, or in the advancement of knowledge itself. Each individual converts ability into something that can be taught or learned. The changes from one piece of knowledge to another can create a new society; based on knowledge and on the people of knowledge, this would give them power.

In the same year, Wiig (1993) states that many organizations are becoming more and more concerned with organizational knowledge, and the use of knowledge to create and make quality products, deliver quality services, and maximize the efficiency of internal operations. Further, Nonaka and Takeuchi (1994) describe organizational knowledge as the capacity of organizations to create knowledge, disseminate it throughout the organization, and incorporate it into products and processes.

It is understood that knowledge does not remain static within constantly changing economies, as in present times. It is a valuable asset that must be identified, evaluated, acquired, transferred, stored, used, and maintained, remaining available for decision-making (Nonaka and Takeuchi, 1991; Pemberton and Stonehouse, 2000; Downes, 2014).

Consequently, knowledge management presents itself as a process through which an organization perceives and generates value through its intellectual and knowledge assets, and is considered to be a new, influential and visible approach to the art and science of management in recent decades (Uriarte, 2008; Inkinen, Kianto and Vanhala, 2015).

### 2.3 Knowledge Management Practices

In 2003, the Organization for Economic Co-operation and Development (OECD) pointed out that the implementation of knowledge management (KM) practices would be a crucial phase in which organizations could promote change and integration within a knowledge-based economy. The Comité Européen de Normalisation (CEN, 2004), sustains that KM practices support and constitute a link between the processes of the KM cycle and the strategic objectives of an organization, precisely because authors consider that absorbing elements of knowledge and combining them is an important management challenge within healthcare organizations (Akdere, 2009; Faraji-Khiavi, Ghobadian and Moradi-Joo, 2015). In a systematic review of the literature on KM practices and organizational performance, Inkinen (2016) presents as a contribution of the study that the results increase the understanding of the efficient and effective management of knowledge resources for organizational benefit. They also point out that organizations must be attentive to attributes of leadership and organizational arrangements to achieve company performance through KM.

This present study considers KM practices to be intentional activities or routines, formal or informal, geared towards adequately managing knowledge. It is also based on its efficient use aligned with task-related objectives that support knowledge management, allowing companies to add value from their knowledge-based assets (Andreeva and Kianto, 2012; Dávila et al., 2014; Kianto and Andreeva, 2014; Inkinen, Kianto and Vanhala, 2015).

We chose the concept of certification presented by Nicklin et al. (2014), as a process of external evaluation used to evaluate and improve quality, efficiency, and efficacy of healthcare organizations, therefore producing higher quality health services in a safe environment. Healthcare organizations that provide physiotherapy services and which belong to the National Federation of Physiotherapy Associations and Companies (FENAFISIO) are the object of this study. Such organizations participate in the FENAFISIO Quality Certification Program, have the Quality Certification Seal, and were consequently subjected to external audits at two different times, diagnosis and audit, at an interval of 6 to 8 months. For this study, we adopted the point of view of Inkinen, Kianto and Vanhala (2015), in which KM practices are a set of management activities that allow companies to add value from their knowledge-based assets, grouping KM practices in ten dimensions, according to Table 1.

**Table 1: Dimensions and Aspects of KM Practices**

<b>Dimensions</b>	<b>Aspects</b>
Strategic management of knowledge	Knowledge as a key input for the development of the organization's strategies
Organizational design	Contemplates the decisions made regarding division of work and responsibilities
Communication and information technology (CIT)	The means to access knowledge in the organization
Knowledge-based recruiting	Directs attention to candidates' skills and abilities
Knowledge-based training and development	Includes courses and seminars for professional development
Knowledge-based performance evaluation	Employee ability to create, use and disseminate knowledge
Knowledge-based compensation	Involves tangible and intangible motivation; career progression; work recognition
Supervision work	Encompasses key management activities; crucial factors in the performance of organizational culture
Knowledge protection	Use of patents, agreements, legislation, or confidentiality
Learning mechanisms	Increased organizational learning through practice and experience

Source: Inkinen, Kianto and Vanhala (2015).

The choice of this list of KM practices is justified using relevant studies in Brazil (Macau, Brito and Duarte, 2016; Dávila, Andreeva and Varvakis, 2019; Dorow et al., 2019; Anjos, 2020). However, this study intends to evaluate nine dimensions of practices: strategic knowledge management, organizational design, communication and information technology, recruiting, training and development, performance evaluation, knowledge-based compensation, supervision and learning mechanisms. We have excluded the knowledge protection dimension since the healthcare organizations participating in this study do not develop patents.

In order to reach the central objective of this study, it is necessary to know the evolution of the quality descriptors that were evaluated, as well as the presence of strategic KM practices in these organizations. In this manner, we present the methodology used to support this study.

### 3. Methodology

The research is of an empirical and applied nature, aiming to generate knowledge for practical application. It is an exploratory, explanatory, and descriptive research (Gil, 2009). Regarding the means, the research utilizes the survey method as it deals with primary data from a sample. Through a quantitative approach and analysis, it seeks to draw conclusions corresponding to the collected data (Gil, 2009).

The population is composed of data from 24 (twenty-four) healthcare organizations distributed throughout 9 (nine) states in Brazil, which belong to the quality certification program of the National Federation of Physiotherapy Associations and Companies, FENAFISIO. This federation is composed of healthcare organizations that provide outpatient, hospital, and home-care physiotherapy services. The analyzed data are part of the quality descriptors verification Check List, verified for adequacy and compliance with the 43 quality descriptors evaluated in the program between December 2018 and December 2022. The analyzed data regarding strategic practices of knowledge management were answered by the managers of the organizations through Google Forms after having been certified, that is, having finalized the process of certification. The respondents indicate how much they agree with the 29 questions related to strategic practices ok KM.

The stages of the research are presented in Table 2.

For this study, two measurement instruments were applied, assuming that this study involves the theory about the relationships between a set of variables relevant to the phenomenon under investigation, and that the measurement instruments attribute value to a certain object or event, considering that the phenomenon of interest is inferred from an indicator with which it is correlated (Pedhazur and Schmelkin, 1991).

The first instrument is the actual document from the certification program we studied, that is, the Verification List of quality descriptors. Each of the 43 quality descriptors evaluated can be found on the checklist and is measured on a conformity scale of 1 to 5. These 43 descriptors are subdivided into 3 (three) groups, which are: Infrastructure (physical infrastructure and administrative infrastructure), Provision of Services and Satisfaction (internal client and external client). The organizations participating in the program are analyzed at two different moments of external evaluation: diagnosis and audit. This includes an interval of approximately 6 months between the two. This document is part of the FENAFISIO program for quality certification called Seal of Certification of Quality, and it is a confidential document based on the “Constructivist model for measuring the quality of physiotherapy services from the manager’s perspective” (Mandelli, 2015). The evaluated checklist items are presented on the verification list of quality descriptors on Table 2.

**Table 2: Verification List of Quality Descriptors**

<b>Infrastructure</b>	Physical structure	Noise, lighting, ventilation, temperature, size, privacy, organization, cleanliness, ergonomic space, internal accessibility, external accessibility, quantity of equipment and calibration
	Administrative structure	Management model, financial management, customer service, integration and training program, standardization of administrative and assistance processes.
<b>Customer service</b>	Professional domain	Scheduling, service time, number of patients per hour, degree of specialization, performance, external improvement, therapist-patient bond, risk

		management, compliance with regulatory bodies, use of PPE, clinical protocols, medical records
	Efficiency and efficacy	Treatment plan, treatment time, objectives achieved, adherence to protocols.
<b>Satisfaction</b>	Professional satisfaction	Fee flexibility, continuing education program, compensation, career plan.
	Client satisfaction	Ability to involve the patient in decisions, listening skills, record of complaints, satisfaction questionnaire.

Source: Mandelli (2015).

The second instrument, the strategic practices of KM questionnaire, obtained from Inkinen, Vanhala and Kianto (2015), considered 9 (nine) dimensions of KM practices. All the answers are scored on a 5-point *Likert* scale, where 1 means completely disagree, and 5 means completely agree. The 9 (nine) dimensions are: strategic knowledge management, organizational design, communication and information technology, knowledge-based recruitment, knowledge-based training and development, performance evaluation, knowledge-based compensation, supervision work and learning mechanisms. Based on these dimensions, 29 practices were contemplated. The questionnaire was sent to all certified organizations in the quality certification program, and 24 (twenty-four) responses were received, the same number of organizations analyzed with research instrument 1, respectively.

#### 4. Results and Discussion

Of the 24 organizations analyzed, 5 offer physiotherapy services in hospitals and 19 offer outpatient physiotherapy services (physiotherapy clinics). At first, we observed the evolution results of these healthcare organizations based on the evolution of the quality descriptors represented by the Verification list of quality descriptors (Research instrument 1). Subsequently, these analyses were descriptively associated with the presence of strategic practices of KM within these organizations (Research instrument 2).

The collected data was processed by means of metric tests, run on SPSS 21 software, and presented in descriptive manner.

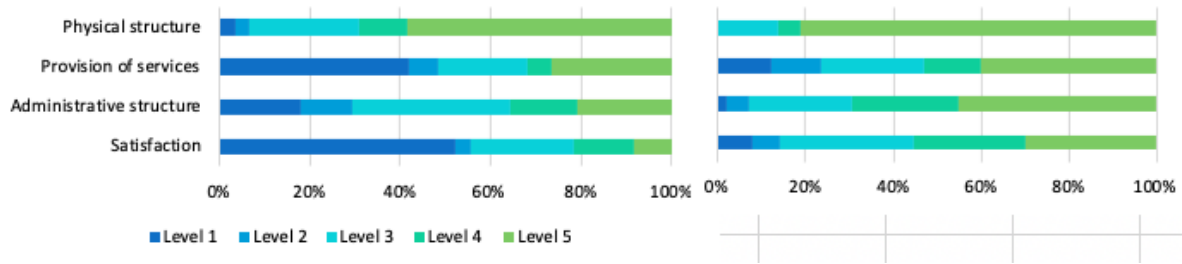
The metrics (before x after) are first presented, which synthesize and compare the average and deviation of the scores according to a group of descriptors, at the time of diagnosis and audit, and the analysis allows for differentiating groups with greater and lesser evolution between both periods (situational diagnosis and final audit). We consider that the average provides a notion of central tendency of the responses obtained from each group. The deviation provides a notion of dispersal, of how homogeneous (the greater the number, the more heterogeneous) are the responses from each group. The variation (%) indicates, in terms of percentile, how much the average and deviation of the items of each group increased (+) or decreased (-) from the diagnosis to the audit.

Group 2	Diagnosis		Audit		Variation (%)	
	Average	Deviation	Average	Deviation	Average	Deviation
Physical structure	4,17	1,24	4,67	0,50	12,0	-60,1
Administrative structure	3,09	1,82	4,05	1,08	31,0	-40,8
Provision of services	2,68	2,76	3,57	2,01	33,3	-26,9
Satisfaction	2,22	1,98	3,63	1,43	63,6	-27,8

Source: Developed by the authors (2023).

#### Figure 1: Descriptive Measures of Item Evaluated by Groups in the Diagnosis and Audit

We can see in Figure 2 the synthesis and comparison of the distribution of answers obtained from the items of each group, according to scale levels, at the time of diagnosis and audit. The analysis allows for perceiving the evolution of response distribution between both periods. This presentation format also shows how well each group is evaluated. Levels 1 to 5 correspond to the possible answer categories of evaluated items, from 1 (worst) to 5 (best), and the colored bars indicate the percentage of answers at each level.



Source: Developed by the authors (2023).

**Figure 2: Distribution (%) of Answers Per Groups in the Diagnosis and per Scale Level in the Audit**

In this manner, the evolution of the verified items was considered to be statistically significant. The satisfaction group presents the greatest evolution of descriptors in relation to the other groups. Customer service and satisfaction are the groups that have descriptors related to the human resources area, such as training and development, performance evaluation, continued education, communication with internal and external clients, as well as client involvement in the decision-making process of their treatment. This present study aims to corroborate with other authors, confirming that certification programs facilitate organizational performance through the lens of improving the evaluated processes in these programs.

The information related to strategic practices of KM is the result of the application of research instrument 2 (two), a KM strategic practices questionnaire, which aims to identify the presence of strategic practices of KM within these organizations.

Firstly, it is important to describe the profile of the respondents. The sample is composed of 24 (Twenty-four) managers, 51.4% of whom are exclusively managers. The remaining respondents are managers and physiotherapists, a characteristic often found in the healthcare organizations that make up FENAFISIO, where the manager also acts as physiotherapist, and vice-versa. The organizations from the sample have been offering physiotherapy services for an average of 21 (twenty-one) years, have an average of 50 (fifty) employees, and their respondents have been working for these organizations for an average of 15 years. Further, all the organizations have gone through the process of quality certification in the last 2 (two) years.

As for the results based on the respondents' perception of existing practices in the actual organizations, we highlight the investigated dimensions that yielded responses above 80%. These were: knowledge-based supervision work and training and development. Tables 3 and 4 exhibit the specific questions for each of the dimensions and the percentage of responses.

**Table 3: Dimension Supervision Work vs. Percentage of Respondents on the Likert Scale Score**

Respondents' perception	score 5	score 4	score 3	score 2	score 1
Encouraging employees to share knowledge in the workplace	91%	8.6%	0	0	0
Encouraging employees to question existing knowledge	80%	11.4%	5.7%	2.9%	0
Supervisors value employees' ideas and point of view by taking them into account	91.4%	8.6%	0	0	0
Supervisors promote discussion in an equitable manner in the workplace	82.9%	14.3%	0	0	0
Share knowledge openly and equitably	91.4%	8.6%	0	0	0
Supervisors allow mistakes to occur and see them as a learning opportunity	54.3%	40%	5.7%	0	0

<b>Respondents' perception</b>	<b>score 5</b>	<b>score 4</b>	<b>score 3</b>	<b>score 2</b>	<b>score 1</b>
<b>Supervisors continually update their own knowledge</b>	71.4%	22.9%	5.7%	0	0

Source: Developed by the authors (2023).

We observed a considerable presence of KM practices related to the dimension of work supervision. Knowledge management practices that represent this dimension are the managerial practices that Inkinen, Kianto and Vanhala (2015) link to how these organizations establish their organizational culture, which, in turn, communicates with authors that relate supervision work as a crucial factor in the development of organizational culture. This affirms the direct impact on how an organization deals with knowledge management. However, we observed a lesser perception of improvement opportunities derived from mistakes. Inkinen (2016), cites supervision work as a dimension that encompasses key management activities, a critical factor in organizational culture performance.

**Table 4: Dimension Knowledge-Based Training and Development vs. Percentage of Respondents on the Likert Scale Score**

<b>Respondents' perception</b>	<b>score 5</b>	<b>score 4</b>	<b>score 3</b>	<b>score 2</b>	<b>score 1</b>
<b>Employees have the opportunity to deepen and expand their knowledge</b>	88.6 %	11.4%	0	0	0
<b>The company offers training that provides employees with knowledge that is up to date</b>	82.9 %	5.7%	8.6%	2.9%	0
<b>Employees have the opportunity to develop skills through training tailored to their specific needs</b>	79.4 %	8.8%	11.8%	0	0
<b>Professional development needs are discussed with employees on a regular basis</b>	60%	34.3%	5.7%	0	0

Source: Developed by the authors (2023).

The intensity of KM practices also appears significantly in the dimension of training and development, which is related to human resource management. This dimension refers to practices that involve the implementation of courses and seminars for employee training and performance. These findings confirm the studies by Dorow (2019) regarding the importance of knowledge sharing in knowledge-intensive healthcare organizations.

Our results corroborate the findings of Inkinen (2016) concerning human-oriented practices as significant factors for company performance. Human resource-oriented activities are related to knowledge-based human resource management and leadership in KM.

The other dimensions of KM practices emerged sporadically in the responses, with little significance in the dimensions of strategic knowledge management and knowledge-based compensation. The literature defines strategic knowledge management as the activities of strategic planning, implementation, and updating related to the knowledge-based assets of the company (Kianto et al., 2014). These activities can enhance organizational performance through mechanisms that allow the organization to focus on activities that add the most value to the company, which is important as intangible assets are sources of competitive advantage (Inkinen, Kianto and Vanhala, 2015; Conner and Prahalad, 1996; Grant, 1996). Aligning strategic knowledge management across various aspects of the organization ensures the utilization of organizational knowledge for action, generating value for healthcare organizations.

Our results support the study by Novaes (2015) that quality certification programs facilitate the development of standards for continuous improvement in patient care and organizational performance. However, when analyzing the presence of knowledge management practices, we observe a relatively incipient and empirical

implementation. This confirms the argument that sustainable societies need to consider the connection between knowledge management and healthcare as a critical issue for social development with patient safety and sustainability for healthcare organizations, as these organizations are also considered to rely on the effective use of knowledge assets and resources (Karamitri, Kitsios and Talias, 2020; Braithwaite et al., 2020).

According to the results obtained in the study, the healthcare organizations participating in the certification program indeed demonstrate significant improvements in the evaluated quality descriptors, particularly in the service delivery and satisfaction groups. When associating these findings with KM practices, we observe an intensity of practices in the dimensions of supervision work and knowledge-based training and development, aligning with the findings of Karamitri, Kitsios and Talias (2020). These authors highlight the existence of KM practices for translating knowledge into action in healthcare organizations regarding specific knowledge sharing issues. However, it is evident that in the other dimensions, the presence of KM practices is incipient, as stated by Silva et al. (2016).

Our study further reinforces the findings of recent research by Karamali (2020) and Hinchcliff (2021), highlighting the need for a greater understanding and formalization of the organizational impact with the presence of KM practices concurrent with the implementation of a quality certification program.

## **5. Final Considerations**

This research aimed to comprehend the presence of KM practices alongside the development of certified healthcare organizations within a certification program in Brazil. It explores the potential for certification programs to generate organizational value through knowledge-based management.

It is evident that the groups of quality descriptors related to human resource management demonstrate significant advancements. Specifically, these dimensions encompass the incorporation of KM practices, such as knowledge-based supervision and training and development.

Our research contributes to bridging the identified gap in the literature regarding the association between KM practices and certification programs. These programs have been employed as management tools, providing support and facilitating the implementation of KM.

Considering the significance of KM practices for healthcare service providers and the nascent discussion within Brazil and within a certification program, the necessity for further studies to deepen the understanding of KM practices associated with organizational development has come to light. Such studies would support organizational performance and development, fostering sustainability and value creation for these organizations.

The obtained results substantiate the importance of incorporating specific quality descriptors for knowledge management within certification programs. This inclusion enables the creation, utilization, and dissemination of knowledge for actionable outcomes within healthcare organizations.

However, the research faces limitations concerning the sample size, specifically the number of participating organizations and respondents. These limitations impede the generalization of the findings. Thus, future studies are suggested to investigate a larger number of organizations, as well as the presence of KM practices in certified organizations. These additional studies can contribute to a comprehensive understanding of how quality management supports KM and jointly generates value and sustainability for healthcare organizations.

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