





KNOWLEDGE MANAGEMENT

A Practical Guide for Universities and Research Institutions

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Science for resilient livelihoods in dry areas



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List of abbreviations

AI	-	Artificial Intelligence
СоР	-	Community of Practice
GIZ	-	German Development Agency
IFAD	-	International Fund for Agricultural Development
ISO	-	International Organization for Standardization
т	-	Information Technology
KM	-	Knowledge Management
KMS	-	Knowledge Management Strategy
KMWG	-	Knowledge Management Working Group
KVE	-	Knowledge Value Equation
ROI	-	Return on Investment Rentabilitatea investițiilor
SECI	-	Socialization Externalization, Combination Internalization
UNDP	-	United Nations Development Programme
USAID	-	United States Agency for International Development

INTRODUCTION

Knowledge management (KM) is a process that involves the creation and implementation of useful knowledge in an organization, as an integral part of the management process of a stage-by-stage developed organization at the confluence of the XX-XXI centuries. Transnational corporations, government agencies, and international institutions implement various KM programs in order to increase organizational efficiency and competitiveness in a rapidly changing global environment.

KM implementation is becoming an increasingly common practice not only for business or government institutions, but its expanded usage is employed also in academia, in different regions of the world. Universities and research institutions, public and private, implement Knowledge Management Strategies alongside Innovation Strategies to increase performance and competitiveness.

KM is essential for academia and research institutions from the perspective of innovation, of accelerating the production and dissemination of knowledge by making the right connections to useful research in other relevant fields, but also from the perspective of stimulating collaboration and knowledge exchange between researchers, a process that contributes to the overall growth of efficiency and productivity. Thus, research institutions and research departments within universities that effectively implement KM programs have a comparative advantage over similar institutions that do not implement such programs; this advantage is gained by stimulating a knowledge-friendly culture, by increasing the level of innovation and the development of higher quality products, as well as by improving the product dissemination mechamisms.

This Guide is addressed first of all to research institutions and universities, which alongside the didactic activity are engaged in research and innovation activities, in the production of knowledge and solutions to the problems of contemporary societies. The purpose of the Guide is to help these institutions to implement KM programs, and to provide theoretical and methodological support for such approaches.

The guide is structured into three chapters:

- *KM: conceptualization and theoretical framework.* In the section in which KM is defined, is described the evolution of KM and, without covering all its dimensions, a brief synthesis of the theoretical framework is made;
- *KM implementation: a step-by-step approach.* This section guides the step by step implementation of KM, in it being described all the stages that the institutions intending to implement KM programs have to go through;
- *KM in practice: successes and failures.* The section highlights the key factors that can lead to the success or failure of KM implementation.

The development of the Guide involved consulting a large number of bibliographic sources, including monographs and fundamental researches from peer-reviewed journals, practical guides, specialized websites, and blogs of knowledge management experts and practitioners. The format in which the material is presented involves footnotes only in the case of direct citations, the rest of the used materials are indicated in the Bibliography section.

I. KNOWLEDGE MANAGEMENT: CONCEPTUALIZATION AND THEORETICAL FRAMEWORK

Knowledge Management – a set of processes, tools and behaviours that connect and motivate people to generate, use and share good practice, learning and expertise to improve organization's efficiency, credibility and development effectiveness.

International Fund for Agricultural Development

The theoretical framework of Knowledge Management has undergone a spectacular evolution in the last two decades. Dozens of monographs and guides for practitioners have been published, specialized journals and web resources have been created, hundreds of studies and scientific articles have been developed and introduced at international conferences, specialized departments have been set up in large companies, and hundreds of consultants in knowledge management have since emerged. All these approaches have developed the theoretical framework and the existing international expertise but they have also made the conceptualization of Knowledge Management more difficult, as it has become an authentic and complex discipline. This first section defines Knowledge Management and is a synthesis of the theoretical framework articulated in three dimensions.

1.1. Knowledge and its management: definition of KM

Knowledge Management (KM) is a systematic approach to collecting, generating, storing, and using knowledge by associating the right people, technologies, and organizational structures, in order to improve the performance and competitiveness of the organization.

The definition of KM has evolved and increased in complexity as the international theoretical framework and practice for implementing knowledge management programs has developed. Thomas Davenport, one of the pioneers of the new discipline, offers the most succinct classical definition: "Knowledge Management is the process of capturing, distributing, and effectively using knowledge"¹. Other definitions of KM have been further developed, and the most frequently cited is the Gartner Inc. definition, according to which KM is: "a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously uncaptured expertise and experience in individual workers"².

¹ McInerney C., Koenig M. (2011). Knowledge Management (KM) Processes in Organizations: Theoretical Foundations and Practice. Morgan & Claypool Publishers, p.1. ² Ibidem.

Although there are many other definitions more or less coherent, in essence, KM is nothing more than finding the best way to identify, generate, and exploit knowledge. After Francis Bacon announced in 1597 that "*Knowledge is power*", mankind gradually understood that knowledge itself cannot bring added value if it is not managed in an efficient manner. In the 21st century, the "*Knowledge Management is Power*", and in order to understand how knowledge can be capitalized upon within an organization, a distinction must be made between two types of knowledge:

- Explicit knowledge is any knowledge that can be easily encoded, meaning that it is easy to capture, store in a database, and then shared with others. Some examples of explicit knowledge include information found in databases, notes, standard operating procedures, videos, etc.
- **Tacit knowledge** is the knowledge existing "in people's heads", as an expression of their training, skills, and motivations. This type of knowledge, often equated with the notion of *know-how*, can be intuitive and is largely based on experience³.



Figure 1. Types of Knowledge

Source: *The Different Types of Knowledge*. [On-line], 2018, Available: <u>http://www.knowledge-management-tools.net/images/svg/different-types-of-knowledge.svg</u>.

The complexity and usefulness of knowledge – it can be a resource (input), it can be incorporated into working methods (part of the process) or it can be a product (output) – makes it a central asset in the 21st century. However, the mere fact that knowledge exists, especially tacit knowledge, does not guarantee strategic advantage and increased

³ The distinction between explicit knowledge and tacit knowledge is associated with the memorable expression of K. Polanyi in the 1960s, namely that "we can know more than we can say." In the context of KM, this distinction was popularized by Nonaka and Takeuchi: "*Explicit or codified knowledge refers to knowledge that can be transmitted in formal, systematic language. On the other hand, tacit knowledge has a personal quality, which makes it difficult to formalize and communicate it*".

competitiveness. For this, knowledge must be properly managed – hence the importance of KM.

Empirical studies that evaluate the results of KM implementation from the international practice perspective, in public and private organizations in different sectors, attest to a number of benefits and advantages of the programs. Among the most often invoked benefits, are:

- Increasing transparency and making it easy to find relevant information and resources;
- Capturing tacit knowledge and codifying it into explicit knowledge;
- Promoting never-ending learning;
- Enabling better and faster decision making;
- Reusing ideas, documents, and expertise;
- Avoiding redundant effort and making the same mistakes twice;
- Communicating important information widely and quickly;
- Providing methods, tools, templates, techniques, and examples;
- Making scarce expertise widely available;
- Increasing network connectivity;
- Stimulating innovation and growth⁴.

The benefits and advantages of implementing KM programs in organizations of any type are not a priori guaranteed. There are stages in the implementation of successful programs, as described in section II, while successes or failures depend on several factors, the most important of which are highlighted in section III of this Guide.

1.2. The History and Development of KM

The KM has been developing in stages since the last decade of the twentieth century. Larry Prusak, the founder of the Institute for Knowledge Management (IKM), argues that the defining moment for the launch of KM was a 1993 conference in Boston. At the same time, he claims that the history and rapid development of KM is due to three trends, namely: globalization, ubiquitous computing, and the attention to the knowledge-centric view of the firm⁵.

The factors that contributed to the development of KM have been similarly depicted also by other authors as globalization, competition and technology (Figure 2). Thus, if the classical scientific management, that is associated with the name of Frederick W. Taylor and with that of his work, the "Principles of Scientific Management" (1911), has developed in the context of the first wave of globalization (1870-1914), then the development of the KM is largely determined by the third wave of globalization (1980-present) and by the related technological revolution.

⁴ North K., Reinhardt R., Schmidt A. (2004). *The Benefits of Knowledge Management: Some empirical evidence*. [On-line], Available: <u>https://warwick.ac.uk/fac/soc/wbs/conf/olkc/archive/oklc5/papers/a-8 north.pdf;</u> Garfield S. (2014). *15 Knowledge Management Benefits*. [On-line], Available: <u>https://www.linkedin.com/pulse/20140811204044-2500783-15-knowledge-management-benefits</u>.

⁵ Prusak L. (2001). Where did knowledge management come from? IBM Systems Journal, 40(4), 1002–1006.

Figure 2. The drivers for knowledge management

Source: Brelade S., Harman Ch. (2003). A Practical Guide to Knowledge Management. London, p. 60.

The KM represents the interdisciplinary managerial innovation of the end of the 20th century, meant to increase the performance and competitiveness of the organization in a world where knowledge is becoming defining. The specialized literature describes a staged development of the KM, although the number and/or particularities of each stage are not always well defined. Claire McInerney and Michael Koenig, for example, distinguish four stages in the development of KM, although they leave room for interpretation regarding the identity of the last stage (Figure 3).

Figure 3. The Four Stages of KM



Source: McInerney C., Koenig M. (2011). *Knowledge Management (KM) Processes in Organizations: Theoretical Foundations and Practice*. Morgan & Claypool Publishers, p.9.

The first stage depicts the synthesis between Information Technologies, the Internet, and Intellectual Capital, a synthesis achieved mainly by consulting companies. Consulting companies have laid the foundations for the development of the KM, together with research in the IT field, after which KM has extended to virtually all sectors of the social-humanities activity. The second stage expresses the recognition of the importance of the cultural dimension in the KM. The third stage focuses on the content and on its structure – *the content management*. The last stage, in the process of confirmation, acknowledges the importance of information and of the external knowledge, from outside the organization, implicitly the way of capturing such knowledge⁶.

The KM is an emerging discipline, which was formed at the intersection of economics, sociology, philosophy, psychology and IT research. The frontiers of KM are still open to innovation, while the main challenge remains to build an integral and coherent theoretical framework, by identifying bridges between the separate theoretical bases of different disciplines.

1.3. KM elements and models

KM is a complex phenomenon that takes place against the background of the organizational culture and is articulated on three elements: **people** – so as to stimulate and nurture the sharing/transmission and use of knowledge; **processes** or methods, in order to identify, generate, capture, and share knowledge; **technology**, to store and make knowledge accessible, as well as to allow interaction between people (Figure 4).



Figure 4. Primary KM elements and organizational context

Source: Gorelick C., Milton N., April K. (2004). *Performance through learning. Knowledge Management in Practice*. Oxford: Elsevier Inc, p.36.

⁶ McInerney C., Koenig M. (2011). *Knowledge Management (KM) Processes in Organizations: Theoretical Foundations and Practice*. Morgan & Claypool Publishers, pp. 5-9.

People are the most important component because knowledge management depends on people's ability and availability to generate, share, and reuse knowledge. Organizational culture is directly related to people and their interaction, being one of the critical factors in the failure of a KM program. Culture involves values, principles, unwritten rules, norms, and procedures employed within the organization. *A knowledge-friendly and KM-enabling culture* is defined as a culture of trust that allows knowledge sharing and is aimed at stimulating and rewarding innovation, learning, experimentation, examination, and reflection⁷.

The *technology* also designated as the *KM Systems* is another important component in knowledge management. Recognizing the importance of IT systems has led many organizations to develop IT strategies and to invest in information technologies since the 1980s. As a result, the KM System has become an equally complex subsystem of KM, containing interrelated and interdependent elements that ensure the technological framework of knowledge management⁸.

The main *processes* associated with knowledge management are the actual activity of generating, codifying, and transferring knowledge. Each of the three basic processes contains corresponding subprocesses. Thus, knowledge generation refers to the subprocesses of searching, retaining, and creating knowledge. Codification refers to the conversion of data and information into symbols that others can understand and includes the subprocesses of storing, classifying, and mapping tacit knowledge, thus making it explicit. Finally, knowledge transfer refers to the subprocesses of distribution, sharing, and usage of organizational knowledge. Knowledge transfer is the key to organizational success, quality, and competitiveness (see Figure 5).



Figure 5. Knowledge Management Processes

Source: Coukos-Semmel E. (2003). *Knowledge Management in Research Universities: The Processes and Strategies.* Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, April 21-25), p.8.

⁷Stylianou V., Savva A. (2016). *Investigating the Knowledge Management Culture*. Universal Journal of Educational Research 4(7): 1515-1521.

⁸ Brelade S., Harman Ch. (2003). A Practical Guide to Knowledge Management. London, p. 17.

The practice of implementing KM programs and the theoretical framework associated with this process have led to the development of several KM models. The KM model represents a structured interpretation of the KM process, a connection of the main processes to the specific needs of each organization. There are several models developed, each focusing on different aspects of the KM process. The WIIG model, for example, attempts to show, through a four-stage cycle, how knowledge is built and used by people and organizations, while the Zack model focuses more on customizing or refining information⁹.

Among the most frequently used models in the implementation of KM is the Nonaka model, which, starting from the two types of knowledge – explicit and tacit – emphasizes the creation of knowledge. Because knowledge creation is an ongoing process and takes place both in a planned and accidental fashion throughout the organization, this model considers that the capture of knowledge is the key to continuous improvement.



Figure 6. The SECI Model

Source: Nonaka I., Toyama R., Noboru K. (2000). SECI, Ba and Leadership: a United Model of Dynamic Knowledge Creation, Long Range Planning 33: 5-34, p.12.

The SECI model is made of four modes of knowledge conversion and is designated by the initials of these modes: *socialization, externalization, combination,* and *internalization.* Socialization (tacit – tacit) is the process of sharing experiences and thus creating tacit knowledge. Externalization (tacit – explicit) is the process of converting tacit knowledge into explicit knowledge, being the most important and, at the same time, the most difficult activity related to the creation of knowledge. Combination (explicit – explicit) is the process of creating explicit knowledge by merging knowledge from different sources. Internalization (explicit – tacit) is the process of incorporating explicit knowledge into tacit knowledge¹⁰.

⁹Edwards J. (2015). Knowledge Management Concepts and Models. In: Bolisani E., Handzic M. *Advances in Knowledge Management. Celebrating Twenty Years of Research and Practice*. Springer International Publishing, pp.29-30; Mohajan H. (2017). The Impact of Knowledge Management Models for the Development of Organizations. *Journal of Environmental Treatment Techniques*, Volume 5, Issue 1, Pages: 12-33.

Environmental Treatment Techniques, Volume 5, Issue 1, Pages: 12-33. ¹⁰ Nonaka I., Toyama R., Noboru K. (2000). SECI, Ba and Leadership: a United Model of Dynamic Knowledge Creation, *Long Range Planning*, 33: 5-34.

II. KNOWLEDGE MANAGEMENT IMPLEMENTATION: A STEP BY STEP APPROACH

Although IT is a wonderful facilitator of data and information transmission and distribution, it can never substitute for the rich interactivity, communication, and learning that is inherent in dialogue. Knowledge is primarily a function and consequence of the meeting and interaction of minds.

Liam Fahey & Laurence Prusak

The implementation of knowledge management programs is a complex and step-by-step process. The specialized literature and international practice develop several approaches and stages of implementation of KM, which involve decisions, activities, and resources from different institutional levels. We further distinguish five stages, in the form of consecutive steps, which must be completed by the institutions that intend to implement KM programs.



Although listed as separate steps, they are interdependent components of the complex KM implementation process. For each stage, is given an indicative sample of the implementation of a KM program at a hypothetical Agricultural Research Institute.

2.1. Current State Assessment: establish Goals and Objectives (Step 1)

KM is an institutional strategic approach (public or private), which requires human resources, financial resources, and time. Therefore, the decision to implement KM and related techniques must be one assumed and adopted at the highest level, by the top management of the organization and/or by its founders. The decision to implement a complex KM initiative implies the commitment to cultivate a new organizational culture and a new level of inter-human relations, and this should be achieved in stages and irreversibly.

The first step in implementing the KM program is to assess the current state of the organization from the perspective of knowledge and, based on the evaluation, to define the purpose and the objectives. The evaluation must outline an overview of the current state of affairs, highlight institutional risks and opportunities, and can be carried out through a number of tools and methods, including:

- Senior Leadership Workshop. The tool involves convening the organization's management (University Board of Directors and the Heads of Departments/ Laboratories of Research Institutions) for a workshop needed to identify critical areas of knowledge, existing gaps, and KM priorities important for the strategic mission of the organization;
- **Semi-structured Interviews**. The qualitative evaluation carried out by interviewing the Heads of Departments or Laboratories;
- **In-Depth Knowledge Survey**. A more formal method that involves conducting a knowledge assessment survey to question all employees of the institution;
- *Knowledge Risk Assessment*. A quantitative assessment of knowledge-related risks for each position within the institution (or within the selected Departments/ Laboratories).

The collected quantitative data and opinions must form the basis of the evaluation and allow the purpose and objectives of the KM to be defined. The purpose of a KM program must be precisely defined and correlated with the general purpose and objectives of the institution. Once the purpose has been established, the objectives of the KM must be formulated; such objectives usually contain the following components:

- capturing lessons learned;
- providing easy access to experts;
- sharing experiences;
- leveraging knowledge of the entire organization;
- improving access and awareness;
- capturing expertise before it leaves;
- embedding knowledge in the strategy¹¹.

It is important that the purpose and objectives are clear, consistent and feasible. International practice shows that in the case of complex KM programs, an average of 3-5 objectives are defined.

¹¹ Gladstone B. (2000). *From Know-How to Knowledge: The Essential Guide to Understanding and Implementing Knowledge Management.* Spiro Press.

SAMPLE: AGRICULTURAL RESEARCH INSTITUTE

Agri-food research is becoming crucial for the survival of human civilization in the 21st century when global population growth is accompanied by climate change, while KM is a key tool for increasing the efficiency of agricultural research institutions.

Following the decision of the *Institute's* (which is one of the largest national research institutions in the field of agriculture) administration to implement a KM program, the assessment of the current state involved the employment of three methods:

- Senior Leadership Workshop;
- Semi-structured Interviews;
- In-Depth Knowledge Survey.

The results of the evaluation indicate the existence of several problems in the process of generating, transmitting, and using knowledge that will be addressed through the KM program, including:

- Slow decision-making mechanisms and poor knowledge transfer culture;
- Outdated research methodology and IT infrastructure;
- Difficulty in locating information/knowledge related to specific problems of the institution, current or historical;
- Doubling efforts and the "permanent reinvention of the wheel";
- Expertise leaving the organization and generating knowledge gaps, through many retired employees possessing valuable knowledge and being difficult to replace;
- Inefficient knowledge dissemination mechanisms and poor connection with the business environment.

At the same time, the evaluation also identifies a series of opportunities that can be further exploited by implementing KM, such as the opening to change and improved performance on the side of young staff, as well as funding prospects for institutional modernization/research projects from external development partners.

The general KM goal:

• Enhance the Institution's productivity and scientific performance by sharing and using the information and knowledge that result from the individual performance of Institute's members and from external sources.

The KM objectives:

- Enabling faster decision-making and promoting a KM-enabling culture;
- Strengthening learning and knowledge-sharing processes;
- Equipping the Institute with a more supportive learning and knowledge-sharing infrastructure/technology.

2.2. Select a Knowledge Management Team (Step 2)

The next step in implementing KM is team selection. The team has the task of implementing the KM program and of ensuring the liaison with all members of the organization. Teams vary depending on the size and specifics of the organization, as well as on the proposed goals and objectives. However, regardless of these variations, any team has two basic components:

- the project leader or the KM manager, and
- the KM team members or the Knowledge Management Working Group (KMWG).

The *KM Manager* is responsible for the entire KM implementation program, for the elaboration and implementation (together with the team) of the Strategy and of the Action Plan, for the coordination of the activity of the entire working group (KMWG). The KM manager must have leadership qualities and solid managerial practice, and it is recommended for him or her to have some training and/or experience in KM programs. It is also recommended that this be a full-time job, but in some cases, for smaller groups, it may be a part-time job. Many large organizations have, in the organization chart, a permanent position at a director level – *the Chief Knowledge Officer* – who is responsible for organizational knowledge.

The *team members* should be familiar with the organization's purpose and objectives and have good technical skills. Team members should also possess a number of specific skills, including communication, negotiation, strategic planning, skills, should be familiarized with KM techniques and information technologies, etc. There are different models for selecting and training KM implementation teams, depending on factors such as the size and specifics of the organization, or on the purpose and objectives of the program. Most of the time, teams will have the following constituency:

- *Consultant*. A KM expert, usually employed full-time, responsible for providing KMrelated expertise to the entire team. The Consultant is also responsible for organizing trainings for the institution's employees.
- *Knowledge stewards*. Knowledge administrators or "knowledge management specialists", should be appointed to each Directorate in the organization, usually on a full-time basis:
 - Responsible for leading and coordinating the knowledge management activities within the respective departments;
 - Conducts knowledge-capturing sessions, internal and external;
 - Responsible for introducing and updating the information and the knowledge of the Department, relevant from a KM perspective, in the intranet portal of the organization.
- *Knowledge retention managers*. A part-time position, usually occupied by one of the team members:
 - Acting as a facilitator for codifying the tacit knowledge obtained from the employees of the institution, usually in the form of lessons learned;
 - Introduces the lessons learned in the "Depository of lessons learned" of the institution and posts other types of transmitted tacit knowledge (which does not fall within the format of lessons learned);
 - Elaborates s "good practices" document throughout the implementation of the KM program.

- *PR Manager*. A full-time (or part-time position for small organizations) PR manager who facilitates the processes of knowledge transit/sharing within the organization and disseminates information and knowledge outside it.
- *IT Specialist.* Responsible for the technological part of the project, implicitly for the creation of a unified knowledge network.
- Other members. Other positions that may be needed as the program develops, including content publishers, web developers, mentors, coaches, human resources, etc.

SAMPLE: AGRICULTURAL RESEARCH INSTITUTE

Given the dimensions of the Institute, which is a medium-sized research institution, as well as given the purpose and objectives of the KM program, an implementation team with the following structure can be designated: the *manager*, a *consultant*, *knowledge administrators* appointed for each Department/Laboratory, who also exercise the functions of knowledge storage managers; *public relations manager* and; and an *IT specialist*.



2.3. Develop a Knowledge Management Strategy and Action Plan (Step 3)

The next step is the drafting of the KM Strategy (KMS) and of the related Action Plan, which can either be elaborated alongside the General Activity Strategy of the institution or as a separate document, but aligned to the general organizational strategy. The strategy is the written document that codifies the commitment to implement a KM program by defining the specific purpose and objectives, set at the initial stage of the program, the expected results, and the methods of achieving such purpose and objectives, including the available resources.

KM Strategies are not identical documents for all approaches to implement knowledge management. The strategies differ depending on the specifics of the implementing institution, the relevant needs for knowledge management found in the evaluations, the aims and objectives proposed to be achieved through KM, the implementation period, the allocated resources, etc.

The strategy does not have to be lengthy or complex – it can fit on a single page. Also, although the implementation period of the Strategy is different for each case, usually these documents are valid for periods of 1 to 5 years. Knowledge management is an ongoing process, but planning its implementation is related to certain time frames.

Research institutions and universities may also implement KM Strategies with different goals and objectives, depending on the organizational structure, the specific needs identified, or the level of implementation of previous similar approaches. Thus, strategies aimed at complex reforms and related activities through an agency-wide approach can be developed and implemented, just as strictly sectoral strategies with reduced objectives, such as documents addressing only the risks associated with retirement of many employees and the lack of institutional memory. Most of the time, however, the Strategies contain complex interventions that cover all the components of KM, especially in the case of institutions that are at the stage of initiating the implementation of the new dimension of modern management.

Complex strategies are balanced documents and target all three elements of KM: people, processes, and the management of information/technology:

- *People* activities aimed at improving the organizational culture and individual skills of employees, including encouraging knowledge-sharing behaviors;
- *Processes* activities that aim to ensure that work processes are improved based on previous experiences and that lessons learned are summarized in order to provide information for future processes;
- *Technology* activities that include the construction of electronic platforms and networks for the transmission/sharing of knowledge, as well as software that allows the capture, store, and document the relevant data and information.

All three elements are crucial for the implementation of KM programs and, as a consequence, mandatory in the elaboration of related Strategies and Plans.

The action plan details the way in which the Strategy will be implemented. Thus, the Action Plan identifies specific activities, performance indicators, and people/institutions who are involved, as well as the necessary resources. The next steps can be followed to develop a KM implementation plan:

- Identify KM activities to implement the Strategy;
- Identify indicators/measurements and evaluation methods;
- Develop a detailed plan for all initiatives;
- Identify resource needs: staff, IT infrastructure, consulting assistance, etc.;
- Develop a budget;
- Set the reference values;
- Set up regular self-assessment, reporting, and review cycles¹².

¹² NCHRP. (2015). *A Guide to Agency-Wide Knowledge Management for State DoT*. TRB's National Cooperative Highway Research Program (NCHRP) Report 813.

SAMPLE: AGRICULTURAL RESEARCH INSTITUTE

The KM strategy contains the specific purpose and objectives defined at the inception stage of the program, and it develops the fields of action related to the basic components of Knowledge Management.

KM Strategy



The implementation plan develops the Strategy by identifying the actions specific to each established area. The sample below describes only the actions specific to each objective and area of intervention, while the rest of the mandatory components of the document are to be customized in the institutional process of direct development of action plans.

KM Implementation Plan

Action	area 1. Governance and culture					
Acti- vity	Description	Responsible	Milestones	Timeframe	Budget	Measurement
1.1 De	velop a good governance framework	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
1.1.1	Encourage the decentralization of the decision-making processes and information flows	Х	Х	Х	Х	Х
1.1.2	Create a Collaborative Work Spaces and embed a KM and Knowledge-sharing across institution	Х	Х	Х	Х	Х
1.1.3	Develop and deliver training modules in KM-related capacities, methods and tools for the staff of the Institute	Х	Х	Х	Х	Х
1.2 Pro	omote a KM-enabling culture					
1.2.1	Introduce incentives to motivate learning, knowledge exchange and innovation	Х	Х	Х	Х	Х
1.2.2	Establish Communities of Practices (CoPs)/networks for each particular domain area	Х	Х	Х	Х	Х
1.2.3	Practice "Knowledge Cafes" and promote "Storytelling Workshops"	Х	Х	Х	Х	Х
1.2.4	Introduce a "learning from leavers" programme to reduce loss of Institutional critical knowledge when staff retires	Х	Х	Х	Х	Х
1.2.5	Establish an Emeritus Program where retirees are able to have an office at Institute and come in once a week or periodically	Х	Х	Х	Х	X
Action	area 2. Knowledge generation and codification					
2.1 Se	t a strategic agenda to create, search and capture knowl	edge	•			
2.1.1	Improve research methodology and systematically generate useful knowledge and innovations	Х	Х	Х	Х	Х
2.1.2	Identify critical areas, where expertise is being lost shortly, and ask primary experts to record videos within their area	X	Х	X	X	Х
2.1.3	Institutionalize a systematic approach to consistently capture best practices and lessons learned from projects in each department, including After Action Reviews	Х	Х	Х	Х	Х
2.1.4	Establish linkage with agri-food companies for additional information and knowledge exchange	Х	Х	Х	Х	Х
2.1.5	Participate in networks and build partnerships with universities and research institutions that promote knowledge exchange and learning on KM, and cutting edge research in the agri-food sector	Х	Х	Х	Х	Х

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4.1.4 Provide innovative technology solutions to support virtual x x x x x x	4.1.3	Develop and institutionalize Institution's intranet and integrate it within a portal concept	Х	Х	Х	Х	Х
	4.1.4	Provide innovative technology solutions to support virtual meetings, workshops, communities and networks	Х	Х	Х	Х	Х

2.4. Implement and Results Measurement (Step 4)

The actual implementation of the Action Plan is the next step, following the decision of the management of the institution to implement a KM program, after the purpose and objectives of the program have been defined, and after the team has been selected and the Strategy and related implementation plan have been developed. The implementation is carried out in accordance with the activities and schedule contained in the Plan.

Existing international experience in the implementation of such programs permits the formulation of additional advice to ensure the success of the process:

- *People first* people and organizational culture must be the key priority in the implementation process, followed by technology and processes;
- Gradual transition the transition to a KM-enabling culture must be accomplished wisely and in stages, so as to allow people to accommodate gradually and in order to avoid "shock therapies";
- Pilot-based phased approach the implementation through pilot methods and initiatives, which allow greater flexibility and adjustment in the implementation process;
- *Respecting the life cycle* the commitment to respect the life cycle for each initiative or activity, from initiation and planning, to evaluation and reporting.

Monitoring and evaluation is an important dimension in the process of implementing KM programs, while the methods and indicators for measuring results (measurement framework) must be identified at the planning stage. Thus, measuring the implementation of KM is a complex process, usually performed in several stages (Figure 7).



Figure 7. KM measurement process

Note: The first two steps are not part of this process, but should be completed before implementing metrics. Source: Authors' elaboration based on the DON CIO. (2001). Metrics Guide to Knowledge Management Initiatives, Washington, DC, p.12.

The measurement process defined in this model contains five basic steps, related to the purpose and objectives of the KM, as well as mechanisms by which the process can be adjusted. The selection of the measurement framework is one of the most important stages of the measurement process, while the traditional difficulty of measuring nontangible assets/activities has led to the development of several approaches and methods relevant for KM.

After unsuccessful attempts to apply the return on investment (ROI) approach¹³. various other approaches have been tried. Mark Clare, for example, developed the knowledge value equation (KVE), an approach that states that the value created by knowledge management is a function of costs, benefits and risks¹⁴. There are models developed within specialized institutions in standardization and organizational management¹⁵ and there are many specialized initiatives in academia, such as The Intangible Assets Monitor (which measures People's Competences, Internal Structure, and External Structure), developed by Karl-Eric Sveiby (of the Swedish Community of Practice)¹⁶.

Also, there have been developed different formulas of the KM Maturity model, frequently used by specialized consulting institutions¹⁷, which is a tool to set the initial state and goals in the dynamics for improvement at the organizational level. International agencies and organizations that implement complex KM Strategies, such as the IFAD Knowledge Management Strategy, use complex measurement and evaluation methodologies, quantitative and qualitative methods, such as tools associated with ISO Standards for KM¹⁸.

SAMPLE: AGRICULTURAL RESEARCH INSTITUTE

Monitoring and measuring the implementation of the Strategy and Action Plan must follow the stages of the process and may involve the use of several quantitative and qualitative methods and tools, including semi-structured interviews; surveys and questionnaires, focus groups, storytelling, statistics of important publications, mapping of results, etc.

The table below is a suggestive and simplified model of the framework for measuring the outputs and outcomes of the KM program, for the second Area of actions. The sample identifies the output indicators for sub-area 2.1 and the outcomes indicators for sub-area 2.2, but the complete framework must contain both groups of indicators for all activities designed in the Action Plan.

¹³ Gorelick C., Milton N., April K. (2004). *Performance through learning. Knowledge Management in Practice*. Oxford: Elsevier Inc, pp. 87-97.

¹⁴ Clare, M. (2002). Solving the knowledge value equation: How to estimate the value of the intangible benefits of KM. Knowledge Management Review, 5(2), 14-15.

Similar to the models elaborated by The British Standards Institution (BSI) or by The American Productivity and Quality Centre (APQC).

¹⁶Sveiby K. (1996). Measuring Intangibles: Suggested Indicators with cases from professional service organisations and high tech firms. [On-line], Available: https://www.sveiby.com/files/pdf/measuringintangibles-suggestedindicators.pdf; Sveiby K.(1997). The Intangible Assets Monitor. [On-line], Available: https://www.sveiby.com/files/pdf/the-intangibleassets-monitor.pdf.

As in the case of TSIA KM Maturity model. [On-line], 2020, Available: https://www.tsia.com/resources/tsia-knowledgemanagement-maturity-model.

ISO 30401, Knowledge management systems — Requirements.

KM Results Measurement Framework

Code	OUTPUT INDICATOR	Source	Baseline
2. 2.1	Improved generation, searching and capture of knowledge on KM and agricultural development		
2.1.1	 Number of knowledge products elaborated in the last 12 months based on identified knowledge gaps; Number of publications and papers written or co-authored by Institute staff in the last 12 months, available on external platforms, library catalogues or e-repositories of partner institutions; Number of new products per researcher; Number of patents per million c.u. of R&D investment. 	Annual Report, KM dashboard	X
2.1.2	Number of realized mentoring and videos recorded	Annual Report	х
2.1.3	• Number of sessions conducted to capture knowledge and lessons learned in each department	Annual Report, Survey, Storytelling	Х
2.1.4	 Number of meetings and on-line conferences organized with agri-food companies; Percentage of joint initiatives on KM-related activities with agri-food companies 	Annual Report, Interviews, Storytelling	Х
2.1.5	 Number of partnerships developed with the purpose of knowledge exchange on, and use of KM solutions; Percentage of research projects developed in the last 12 months with partner institutions 	Annual Report	Х
Code	OUTCOME INDICATOR	Source	Baseline
2.	Institute becomes a regional leader in generating knowledge on sustainable development of agriculture		
<i>L.L</i>	and organic farming		
2.2.1	Percentage of personnel time saved by using a Knowledge Map	Survey Storytelling	Х
2.2.2	• Percentage of lessons learned in the implemented projects that were codified in the last 12 months	Interviews, Storytelling	х
2.2.3	Percentage of time and money saved by using a web- based knowledge preservation tool	Annual Report, Interviews	X

2.5. Continuous Improvement (Step 5)

Continuous Improvement is a paradigm initially developed by Japanese management (*Kaizen*) in the second half of the twentieth century, after which it became an indispensable component in the international practice of quality management. William Edwards Deming, one of the architects of the approach, defines Continuous Improvement as "improvement initiatives that increase success and reduce failure"¹⁹. Starting from the premise that a better way of conceiving things can always be found, Deming introduces the sequential processes of quality (four-step quality assurance model: P - plan, D - do, C - check, A - act) in managerial practice. More comprehensive Continuous Improvement approaches and paradigms and complex methodologies are subsequently developed, such as the *Lean Six Sigma* model, all of which have in common the identification of what can be better done compared to previous approaches²⁰.

Although originally designed for the manufacturing industry, Continuous Improvement was later extended to knowledge-based environments, processes, and intangible assets. In this context, Knowledge Management is often understood as one of the mechanisms for ensuring continuous improvement, a mechanism that is becoming essential in the 21st century knowledge economy²¹. However, the relationship between the two categories is much more complex, and since a lengthy process such as the implementation of Knowledge Management cannot be feasible without the continuous improvement of related actions, the roles can be reversed.

The process of measuring the implementation results allows the identification of actions/activities that need to be changed or adjusted, in order to achieve the purpose and objectives of the Strategy, while the phased and piloted implementation of the Action Plan allows for the continuous improvement of the process. At the same time, the Continuous Improvement is "continuous" because it does not refer only to the changes that occur during the implementation of an Action Plan, but also those occurring in the design of the following strategic documents on KM.

SAMPLE: AGRICULTURAL RESEARCH INSTITUTE

KM is a long-term commitment of the Institute, a continuous journey that is associated with Continuous Improvement. Continuous Improvement methods and tools allow for a higher return on the subsequent KM Strategies.

¹⁹ Juergensen T. (2000). *Continuous Improvement: Mindsets, Capability, Process, Tools and Results*, The Juergensen Consulting Group, Inc., Indianapolis, IN.

²⁰Singh J., Singh H. (2012). Continuous improvement approach: state-of-art review and future implications, <u>International Journal of Lean Six Sigma</u>, Vol. 3 No. 2, pp. 88-111; Hough H. et al. (2017). Continuous Improvement in Practice. PACE, [On-line], Available: <u>https://www.edpolicyinca.org/sites/default/files/CI%20in%20Pratice.pdf</u>.; Aartsengel van A., Kurtoglu S. (2013). Handbook on Continuous Improvement Transformation. The Lean Six Sigma Framework and Systematic Methodology for Implementation. Springer.

²¹ Judy O. (2008). *Knowledge Management Practices To Support Continuous Improvement*. Journal of Knowledge Management Practice, Vol. 9, No. 4; Muras A., Hovell J. (2014). *Continuous Improvement Through Collaboration, Social learning, and Knowledge Management*. The Journal of Corporate Accounting and Finance, March/April, pp.51-59; Barber K.D., et al. (2006). Process based knowledge management systems for continuous improvement. International Journal of Quality & Reliability Management. Vol. 23, No. 8, pp. 1002-1018.

At the same time, Continuous Improvement allows for the correction of deviations from the current Action Plan and the definition of future KM commitments to create new knowledge and stimulate innovation, expand and capitalize on existing networks (*people networks*), and use emerging technologies. Such approaches involve interventions relevant to all four Areas of Action, including:

A 1	 Organize Knowledge Sharing Forums at Institute to allow experienced project managers to share their insights with up-and-coming project managers
A2	 Create and maintain a taxonomy that can be used to organize and classify information
A 3	 Pilot an interactive knowledge exchange system to enhance sharing and use of Institute studies and research
A4	Implement a Cognitive Computing and Artificial Intelligence

III. KNOWLEDGE MANAGEMENT IN PRACTICE: SUCCESSES AND FAILURES

History shows that most management philosophies were first practiced in the large company and once they gained acceptance they become adopted in the other sectors, including government.

Rodney McAdam and Renee Reid

KM programs have been implemented mainly in large private sector companies, and with various results. KM can ensure the increase in productivity, efficiency, and competitiveness of organizations, gradually becoming an indispensable managerial component in the knowledge economy of the 21st century, but success is not guaranteed. International practice attests to both successes and failures. This last section highlights the most important factors that contribute to success, along with the mistakes that must be avoided in the implementation of KM.

3.1. KM Success: key success factors

KM is implemented by different public and private organizations of different spheres of activity. The large private companies were the first to implement complex KM programs, as is the case of large companies in the field of consulting and audit, which were among the first to implement such approaches, but also by companies in the energy sector.

The implementation of KM has become commonplace in the financial-banking and insurance sectors, in the medical and military sectors, in transport and telecommunications, in social protection, or by various government agencies. Many national agencies, such as USAID and GIZ, or international development agencies, such as the World Bank, UNDP, and IFAD, implement different KM strategies. Universities and research institutions, specifically more and more universities in Southeast Asia²², or agricultural research institutions in Africa²³, opt for various KM techniques and programs.

Many of the implemented KM programs are successfully executed. Knowledge management strategies and techniques are already part of the organizational culture of public and private institutions, which have thus become more efficient and competitive. The successful implementation of KM programs in different institutions and sectors has

²² Sharma A., Hassan A., Rishi O. (2017). Knowledge Management in Higher Education Institutions - With Special Reference to Universities in India, în: Artur Lugmayr, Doug Vogel (edts), Managing and Leading Creative Universities-Foundations of Successful Science Management: A Hands-On Guide for (Future) Academics, International Series for Information Systems and Management in Creative eMedia (CreMedia), International Ambient Media Association (iAMEA), n. 2017/1.

²³ Akuku B., Oboko R. Waema T (2020). *Institutionalization of knowledge management strategies in agricultural research organizations: a systematic review of the international literature.* Knowledge Management for Development Journal 15(1): 73-98.

allowed the identification of a number of factors that greatly contribute to their implementation. Figure 8 shows a synthesis of the main success factors in the implementation of KM, as identified in the specialized literature.

Figure 8. KM critical success factors



Source: Authors' elaboration based on the Jennex M. (2007). *Knowledge Management in Modern Organizations*. Idea Group Inc, p.197.

This summary is not an exhaustive list, and further implementation of KM programs will highlight other factors and aspects of success, perhaps some specific features for each sector. But this synthesis will always constitute the basis of a successful program, which cannot ignore vital factors such as phased and well-supported planning, organizational culture, or the openness of the organization's management and staff to change.

3.2. KM Failure: key failure factors

Not all KM programs are successfully implemented. Some empirical studies claim that the failure rate is about 50%, and the number could be even higher if the failure was defined in a broader sense, by including programs that did not live up to expectations²⁴. In fact, the high failure rate has contributed to the decline in KM's popularity.

Academic ethics does not encourage references to organizations that have failed to implement KM programs, as evidenced by the fact that the literature usually makes reference only to success stories. However, after more than two decades of KM programs implementation, the theoretical and empirical studies have identified several mistakes that must be avoided in the design, implementation, and evaluation process.

The lack of a feasible and balanced KM Strategy – covering all components (people, processes, and technology) and being implemented in stages, is often the cause of failure invoked most of the times by researchers or consultants in the field. Also, the importance of organizational culture or more precisely the lack of a knowledge-friendly culture becomes a more and more obvious cause of failure. Beyond these defining causes, various theorists and practitioners identify several factors that lead to the failure of KM implementation. Figure 9 depicts the most important and frequently encountered factors.



Figure 9. Key failure factors

Source: Rhem A. (2017). Knowledge Management in Practice. CRC Press, p. 373.

²⁴ Frost, A. (2014). A synthesis of knowledge management failure factors. [On-line], available at: http://www.knowledge-management-tools.net/.

As with success indicators, this is not an exhaustive list of factors that lead to failure. These are the factors that must be taken into account when designing and implementing successful KM programs. Digitization, the development of Artificial Intelligence, and the change of the culture of communication between people, with which the 21st century began, will bring new challenges for the implementation of KM programs, challenges which will require new answers.

CONCLUSIONS

- Knowledge is the central asset in the "knowledge economy" of the 21st century. But the
 mere fact that knowledge exists, explicit knowledge and especially tacit knowledge,
 does not guarantee strategic advantage and increased organizational competitiveness.
 Knowledge must be properly managed to ensure increased efficiency and productivity,
 for which purpose Knowledge Management has been developed.
- Knowledge Management is the process of capturing, disseminating, and using the knowledge efficiently, a process that has undergone a spectacular evolution in the last two decades, a time-frame in which private companies, government structures, and international agencies have implemented various KM programs. Universities and research institutions from different regions of the world, public and private, implement Strategies for Knowledge Management alongside Innovation Strategies to increase performance and competitiveness.
- The competitiveness and efficiency of institutions implementing KM programs increase due to the development of a friendly culture in relation to knowledge, due to increasing innovation and development level of higher quality products, as well as due to improved mechanisms for product dissemination.
- The implementation of knowledge management programs is a complex and phased process, which involves decisions, activities, resources, and time. In order to achieve successful programs, we have highlighted five consecutive steps that institutions intending to implement KM must go through: *setting the goal and objectives; team selection; drafting the KM Strategy and Action Plan; implementation and results measurement, and continuous improvement.*
- Strategies and Action Plans must be balanced documents covering all three elements of the KM – people, processes, information and technology – as they must establish the activities to be carried out, identify the necessary resources and define the outcome indicators.
- The organizational culture and the openness of the organization's management and of its' staff to change, are vital factors for the success of KM programs, along with the widespread use of information technology.
- Digitization, the development of Artificial Intelligence, and the change of the culture of communication between people, with which the 21st century began, will pose new challenges for the implementation of future KM programs. As the frontiers of KM remain open for future innovations, so must also universities or research institutions remain open to their implementation.

Bibliography

- Aartsengel van A., Kurtoglu S. (2013). Handbook on Continuous Improvement Transformation. The Lean Six Sigma Framework and Systematic Methodology for Implementation. Springer.
- Akuku B., Oboko R. Waema T (2020). Institutionalization of knowledge management strategies in agricultural research organizations: a systematic review of the international literature. Knowledge Management for Development Journal, 15(1): 73-98.
- Baets W. (Ed.). (2005). *Knowledge Management and Management learning: Extending the Horizons of Knowledge-Based Management*. Springer Science+Business Media.
- Barber K.D., et al. (2006). Process based knowledge management systems for continuous improvement. *International Journal of Quality & Reliability Management*. Vol. 23, No. 8, pp. 1002-1018.
- Bergeron B. (2003). Essentials of Knowledge Management. John Wiley & Sons, Inc.
- Bolisani E., Handzic M. (2015). Advances in Knowledge Management. Celebrating Twenty Years of Research and Practice. Springer International Publishing.
- Brelade S., Harman Ch. (2003). A Practical Guide to Knowledge Management. London.
- Broad R (2007). Knowledge management': a case study of the World Bank's research department, *Development in Practice*, 17:4-5, 700-708.
- Clare, M. (2002). Solving the knowledge value equation: How to estimate the value of the intangible benefits of KM. *Knowledge Management Review*, 5(2), 14–15.
- Coukos-Semmel E. (2003). *Knowledge Management in Research Universities: The Processes and Strategies.* Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, April 21-25).
- Dalkir K. (2011). Knowledge Management in Theory and Practice. Cambridge: MIT.
- Davenport, T., & Prusak, L. (1998). Working knowledge How organisations manage what they know. Boston: Harvard Business School Press.
- Dierkes, M., Antal, A. B., Child, J., & Nonaka, I. (Eds.). (2003). *Handbook of organizational learning and knowledge*. Oxford: Oxford University Press.
- DON CIO. (2001). Metrics Guide to Knowledge Management Initiatives, Washington, DC.
- Earl, M. J. (2001). Knowledge management strategies: Toward a taxonomy. *Journal of Management Information Systems*, 18(1), 215–233.
- Edwards J. (2015). Knowledge Management Concepts and Models. In: Bolisani E., Handzic M. Advances in Knowledge Management. Celebrating Twenty Years of Research and Practice. Springer International Publishing.
- Frost, A. (2014). A synthesis of knowledge management failure factors. [On-line], available at: <u>http://www.knowledge-management-tools.net/</u>
- Garfield S. (2014). 15 Knowledge Management Benefits. [On-line], available: <u>https://www.linkedin.com/pulse/20140811204044-2500783-15-knowledge-management-benefits</u>.
- Gladstone B. (2000). From Know-How to Knowledge: The Essential Guide to Understanding and Implementing Knowledge Management. Spiro Press.
- Gorelick C., Milton N., April K. (2004). *Performance through learning. Knowledge Management in Practice*. Oxford: Elsevier Inc.

- Graziano, V., Akramkhanov, A., Bonaiuti, E., (2018). *Knowledge Management Strategy*. Strengthening Knowledge Management for Greater Development Effectiveness in the Near East, North Africa, Central Asia and Europe. Beirut, Lebanon: International Center for Agricultural Research in the Dry Areas (ICARDA).
- Graziano, V., Durrell, J., Akramkhanov, A., Bonaiuti, E., Holm, A., Mueller, B. (2020). *Knowledge Management and Communication Plans*. Strengthening Knowledge Management for Greater Development Effectiveness in the Near East, North Africa, Central Asia and Europe. Beirut, Lebanon: International Center for Agricultural Research in the Dry Areas (ICARDA).
- Hough H. et al. (2017). *Continuous Improvement in Practice*. PACE, [On-line], available: https://www.edpolicyinca.org/sites/default/files/CI%20in%20Pratice.pdf.
- Hunter B. (2016). *The Power of KM: Harnessing the Extraordinary Value of Knowledge Management.* Spirit Rising Productions.
- Jennex M. (2005). Case Studies in Knowledge Management. Idea Group Inc.
- Jennex M. (2007). Knowledge Management in Modern Organizations. Idea Group Inc.
- Judy O. (2008). Knowledge Management Practices To Support Continuous Improvement. *Journal of Knowledge Management Practice*, Vol. 9, No. 4.
- Juergensen T. (2000). *Continuous Improvement: Mindsets, Capability, Process, Tools and Results*, The Juergensen Consulting Group, Inc., Indianapolis, IN.
- Maier R. (2007). *Knowledge Management Systems:Information and Communication Technologies for Knowledge Management*. Springer-Verlag Berlin Heidelberg.
- McInerney C., Koenig M. (2011). *Knowledge Management (KM) Processes in Organizations: Theoretical Foundations and Practice*. Morgan & Claypool Publishers.
- Milton N. (2019). The Knowledge Manager's Handbook; A Step-by-Step Guide to Embedding Effective Knowledge Management in your Organization. Kogan Page, 2019.
- Mohajan H. (2017). The Impact of Knowledge Management Models for the Development of Organizations. *Journal of Environmental Treatment Techniques*, Volume 5, Issue 1: 12-33.
- Muras A., Hovell J. (2014). Continuous Improvement Through Collaboration, Social learning, and Knowledge Management. The Journal of Corporate Accounting and Finance, March/April, pp.51-59.
- NCHRP. (2015). A Guide to Agency-Wide Knowledge Management for State DoT. TRB's National Cooperative Highway Research Program (NCHRP) Report 813.
- Nonaka I., Toyama R., Noboru K. (2000). SECI, Ba and Leadership: a United Model of Dynamic Knowledge Creation, *Long Range Planning*, 33: 5-34.
- North K., Reinhardt R., Schmidt A. (2004). *The Benefits of Knowledge Management: Some empirical evidence*. [On-line], Available: https://warwick.ac.uk/fac/soc/wbs/conf/olkc/archive/oklc5/papers/a-8_north.pdf.
- Prusak L. (2001). Where did knowledge management come from? IBM Systems Journal, 40(4), 1002–1006.
- Rao M (Ed). (2005). Knowledge Management Tools and Techniques. Elsevier Inc.
- Rhem A. (2017). Knowledge Management in Practice. CRC Press.
- Russ M. (2010). Knowledge Management Strategies for Business Development. IGI Global.
- Schwarts D. (2006). Ecyclopedia of Knowledge Management. Idea Group Inc.
- Sharma A., Hassan A., Rishi O. (2017). *Knowledge Management in Higher Education Institutions – With Special Reference to Universities in India*. In: Artur Lugmayr, Doug

Vogel (edts), Managing and Leading Creative Universities-Foundations of Successful Science Management: A Hands-On Guide for (Future) Academics, International Series for Information Systems and Management in Creative eMedia (CreMedia), International Ambient Media Association (iAMEA), no. 2017/1.

- Singh J., Singh H. (2012). Continuous improvement approach: state-of-art review and future implications, *International Journal of Lean Six Sigma*, Vol. 3 No. 2, pp. 88-111;
- Stylianou V., Savva A. (2016). Investigating the Knowledge Management Culture. *Universal Journal of Educational Research* 4(7): 1515-1521.
- Sveiby K. (1996). *Measuring Intangibles*: Suggested Indicators with cases from professional service organisations and high tech firms. [On-line], available: <u>https://www.sveiby.com/files/pdf/measuringintangibles-suggestedindicators.pdf</u>.
- Sveiby K. (2007). The New Organizational Wealth: Managing and Measuring Intangible Assets. San Francisco.
- Sveiby K.(1997). *The Intangible Assets Monitor.* [On-line], Available: <u>https://www.sveiby.com/files/pdf/the-intangible-assets-monitor.pdf</u>.
- Tiwana A. The Knowledge Management Toolkit. Prentice Hall PTR, 1999.