

# ROSATOM's Vision of Managing Knowledge for Innovative Development

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**Abstract.** Many countries choose nuclear power to achieve energy security and sustainable development goals. Rosatom's experience demonstrates that the current development level of nuclear technology requires a comprehensive knowledge management system that manages the entire life cycle of corporate knowledge and is integrated into corporate business processes. Rosatom strongly believes that the experience accumulated by nuclear organizations in knowledge management worldwide should be made available to benefit existing and future members of the nuclear community who choose nuclear technology for peaceful development.

## 1. Introduction

Many countries choose nuclear power to achieve energy security and sustainable development goals. The IAEA's latest projections show continued growth in the global use of nuclear power in the next 20 years, especially in Asia.<sup>1</sup>

Rosatom alone has secured contracts to build 22 new nuclear power units; the overall value of its commitments to international contracts in the next 10 years exceeds 100 billion dollars.<sup>2</sup>

Today nuclear power is the best-known and developed peaceful application of nuclear technology. At the same time, the IAEA reports that more and more countries use nuclear technology to address their development needs in areas such as food and agriculture, human health, environment, and water management, etc. According to the IAEA Director-General "globally, health and nutrition make up the largest proportion of Technical Cooperation spending, followed by safety and security, and then by food and agriculture."<sup>3</sup>

## 2. Knowledge management for development

Rosatom strongly believes that further integration of nuclear technology into the development agenda of both developing and developed countries can substantially improve the quality of life of millions of people worldwide.

By choosing nuclear technology and its applications, countries choose a unique and lasting contribution to achieving their development goals. However, Rosatom's experience shows that in order to achieve and sustain a high level of safety and increase the economic benefits from the utilization of nuclear technology, countries and respective nuclear organizations need to manage nuclear knowledge and practices in a systematic and sustainable manner.<sup>4</sup>

Why is the issue of knowledge management so important? There are several reasons for this. Firstly, organizations increasingly rely on the expert opinions (tacit knowledge) of top researchers in the respective scientific areas in addition to existing corporate explicit knowledge (statistics, data, etc.) to make strategic management decisions.

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<sup>1</sup> <http://www.iaea.org/newscenter/statements/2013/amsp2013n18.html>

<sup>2</sup> <http://www.vestifinance.ru/articles/40861>

<sup>3</sup> <http://www.iaea.org/newscenter/statements/2013/amsp2013n18.html>

<sup>4</sup> For more information refer to "Rosatom shares knowledge – Knowledge management in high-tech companies" book.

Secondly, in today's highly uncertain and complex environment, it is becoming more important both to maximize the utilization of scientific expertise and to introduce effective techniques in organizing and formalizing knowledge in order to convert it into the intellectual property rights and investment resources of a company.

Thirdly, practice shows that organizations that use knowledge as an active asset for business development and have a robust knowledge management system may achieve higher capitalization than companies that have natural resources as their main assets. Out of the top ten publicly traded companies in terms of market capitalization, six companies treat knowledge as a financial derivative (Apple, Berkshire Hathaway, General Electric, Google, IBM, Microsoft).<sup>5</sup>

### 3. Rosatom knowledge management system (KMS)

Rosatom conducted benchmark research in over 100 organizations which use KM technologies; the results of which showed that in many of those organizations knowledge dissipates and is therefore not fully exploited to foster corporate development.<sup>6</sup>

Why is this happening? First of all because knowledge is a peculiar resource. Knowledge creators and knowledge bearers are human beings, and therefore, the most important thing in knowledge management is managing human resources. The separation of knowledge from its founder and bearer is a subtle, complex and not always successful process.

Another reason is because in many cases (especially in industrial companies), it is not sufficient just to introduce a knowledge management system (KMS). Top management is generally focused on extracting tangible benefits from the implementation of any system in an organization. It is therefore critically important to convince top corporate executives to support the introduction of KMS, which is not necessarily easy to do.

Rosatom's experience demonstrates that the current development level of nuclear technology requires a comprehensive knowledge management system that manages the entire life cycle of corporate knowledge and is integrated into corporate business processes.<sup>7</sup>



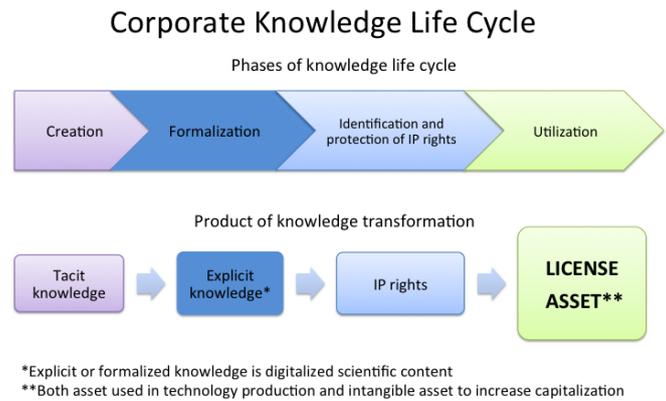
FIG.1. Rosatom development framework

<sup>5</sup> Data of December 2013. <http://www.pwc.com/gx/en/audit-services/capital-market/publications/top100-market-capitalisation.jhtml>

<sup>6</sup> For more information refer to "Rosatom shares knowledge – Knowledge management in high-tech companies" book.

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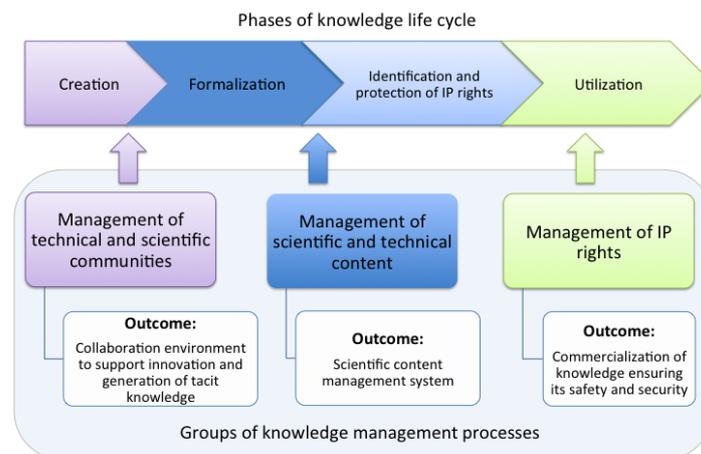
Rosatom KMS manages the entire life cycle of generation and use of knowledge from idea origination to its utilization as a license or an asset, and by doing this creates an infrastructure for fostering innovative activity, increasing efficiency of research and development (R&D) activities, and managing the results of innovations.



*FIG.2. Life cycle of corporate knowledge*

Considering the sensitive nature of the nuclear knowledge life cycle, Rosatom KMS assumes additional responsibility in terms of the safety and security of nuclear knowledge. Safety and security are embedded in each phase of the knowledge transformation to ensure the protection and proper use of nuclear knowledge.

To support the transformation of ideas into licenses and assets, three major groups of KM processes were created to target different phases of the corporate knowledge life cycle.



*FIG.3. Scope of Rosatom knowledge management system*

The first group of KM processes, the “Management of scientific and technical communities” group, is designed to create an environment for the generation of new ideas or new tacit knowledge as well as to support its further transfer to the formalization phase. The purpose of this functional block is to increase both individual and collective innovative activity within and between Rosatom organizations as well as to ensure the transfer of tacit knowledge between generations.

The second group of KM processes, the “Management of scientific and technical content” group, is designed to provide access to and ensure effective use of explicit knowledge among the employees and organizations of Rosatom. The purpose of this functional block is to increase the efficiency of R&D activities by providing correct information at the right time to different employees engaged in

research and development activities as well as activities for the preservation of explicit critical knowledge.

The third group of KM processes, the “Management of IP rights” group, is designed to convert knowledge into intellectual property rights, protect it, sell it via licenses and use it to produce innovative technology. The purpose of this functional block is to commercialize knowledge that has been previously generated and formalized.

#### **4. Lessons learned**

Based on the results of the implementation of this system, Rosatom has been able to summarize several key factors for the successful introduction of KMS<sup>8</sup>:

1. KMS goals and objectives should be linked to corporate financial performance indicators.
2. KMS should be a comprehensive system covering the full knowledge life cycle with a particular focus on achieving corporate business goals.
3. KMS should effectively transform knowledge into corporate intellectual property and financial assets.
4. KMS should receive top management support (both financial and ideological)
5. KMS should involve staff from all corporate departments and divisions.
6. Knowledge management leaders should be identified, supported and constantly trained to implement KMS.

#### **5. Looking forward**

Rosatom strongly believes that the experience accumulated by nuclear organizations in knowledge management worldwide should be made available to benefit existing and future members of the nuclear community who choose nuclear technology for peaceful development. Rosatom looks towards the IAEA to facilitate the exchange of this knowledge. Specifically we suggest the following:

1. Knowledge management is a living and complex process that requires constant development and the sharing of experiences. It is critical that organizations pay special attention to supporting and developing KM leaders who are the driving force of this process. It is therefore important to have a network of such leaders where they can share experiences and best practices. Rosatom considers this to be a priority task in the short and long-term perspective and looks to the IAEA to develop a relevant network.
2. A knowledge management system is a comprehensive framework that creates and supports nuclear infrastructure at every stage of the nuclear technology life cycle. Rosatom suggests that the IAEA should integrate KM methodology into other relevant IAEA methodologies and review services like the Capacity Building methodology, the Milestones methodology, the SSG-16 guidance, etc.
3. Considering the increasing value of knowledge in high-tech organizations, Rosatom calls upon the Member States to promote and actively use knowledge as an asset for innovative development and the improvement of organizational performance as well as implement modern knowledge management approaches in their respective organizations.

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<sup>8</sup> For more information refer to “Rosatom shares knowledge – Knowledge management in high-tech companies” book.