Knowledge Management

Case Studies in Mongolian Energy and Mining Sectors

Asian Productivity Organization

The Asian Productivity Organization (APO) is an intergovernmental organization that promotes productivity as a key enabler for socioeconomic development and organizational and enterprise growth. It promotes productivity improvement tools, techniques, and methodologies; supports the National Productivity Organizations of its members; conducts research on productivity trends; and disseminates productivity information, analyses, and data. The APO was established in 1961 and comprises 21 members.

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KNOWLEDGE MANAGEMENT CASE STUDIES IN MONGOLIAN ENERGY AND MINING SECTORS

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IN MONGOLIAN ENERGY AND MINING SECTORS

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FOREWORD

In an era when knowledge is the most important asset for corporate success, the imperative for organizations to discern and evaluate their knowledge assets cannot be overstated. This necessitates the establishment of robust processes and the cultivation of behavioral shifts conducive to the seamless management of knowledge and information, thereby smoothing the path toward sustainable development.

In the vast terrain of Mongolia, where the energy and mining sectors are important pillars of the national economy, the pursuit of productivity and innovation is paramount. Yet, even with the rich land and mineral resources, challenges such as infrastructure limitations and environmental concerns underscore the need for strategic management of knowledge assets due to huge amounts of data and knowledge accumulated over a long history of development.

Since the publication of the APO Knowledge Management Facilitators' Guide (KMFG) in 2009, the APO has been promoting KM tools and fostering a culture of knowledge sharing. A project on Development of Demonstration Companies on Productivity Improvement in Energy and Mining Sectors through Knowledge Management (KM) was initiated by the APO and Mongolian Productivity Organization (MPO) in 2023 to harness the power of KM.

Based on the results of that project, Knowledge Management Case Studies in Mongolian Energy and Mining Sectors, Dr. Ida binti Md Yasin, Associate Professor, Putra Business School, Malaysia shares how three selected companies, Erdenet Mining Corporation, Thermal Power Plant No. 3, and Cable Utilization and Maintenance Centre, embraced KM tools to resolve problems and overcome challenges with her guidance. It is a narrative of resilience and innovation, showcasing tangible results in productivity enhancement and organizational efficiency.

The APO hopes that this publication transcends its role as a repository of case studies to catalyze change, acting as a blueprint for other organizations to utilize the transformative power of KM. The lessons in its pages point to new horizons of possibility for productivity and innovation within Mongolia's energy and mining sectors and beyond.

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KNOWLEDGE MANAGEMENT CASE STUDIES IN MONGOLIAN ENERGY AND MINING SECTORS

Introduction

Background

Knowledge Management (KM) is an integrated approach to create, share, and apply knowledge to enhance organizational productivity, innovation, and growth. To help companies improve their productivity and innovation, the "Development of Demonstration Companies on Productivity Improvement in Energy and Mining Sectors through Knowledge Management (KM)" project was implemented in Mongolia in 2023.

The purpose of KM is to integrate internal and external knowledge continuously to adapt to environmental changes within and outside the organization, solve existing problems, and innovate for business efficiency and productivity. While explicit knowledge can be formally documented and shared, tacit knowledge exists inside the minds of employees. It comes from job experience and can be difficult to articulate or express. It takes the form of personal wisdom, intuition, and insights.

Managing both tacit and explicit knowledge is crucial for energy and mining companies for several key reasons:

i) **Innovation and problem-solving:** Energy and mining companies operate in a rapidly evolving industry with complex challenges. Tacit knowledge, which is often deeply rooted in individuals' experiences and insights, can be pivotal for innovative solutions and effective problem-solving. By managing tacit knowledge, companies can tap into employees' expertise, creativity, and intuition to address new challenges and develop breakthrough technologies.

ii) **Operational efficiency:** Explicit knowledge, such as documented processes, technical specifications, and best practices, is essential for maintaining operational efficiency. Proper management of explicit knowledge ensures that employees have access to accurate and up-to-date information, reducing errors, and improving workflow. This is particularly important in energy and mining companies where precision and safety are paramount.

iii) **Knowledge retention and continuity:** Energy and mining companies often face turnover and retirement of experienced personnel, resulting in potential loss of critical tacit knowledge. By actively managing tacit knowledge through methods, like mentoring, knowledge transfer programs, or communities of practice, organizations can preserve valuable insights and prevent disruptions to operations.

iv) **Risk management and compliance:** Compliance requirements in the energy and mining sectors demand adherence to specific standards and regulations. Explicit KM plays a key role in ensuring that employees are aware of and compliant with these standards. Similarly, tacit knowledge can inform decision-making regarding risk management strategies and response protocols.

v) **Customer satisfaction and market adaptation:** Understanding customer needs and adapting to market demands are essential for the success of energy and mining companies. Tacit knowledge

about customer preferences and market trends enables companies to tailor their products and services effectively. Explicit knowledge, on the other hand, facilitates the dissemination of market intelligence across the organization.

vi) **Continuous learning and development:** Both tacit and explicit KM support continuous learning and development within energy and mining companies. By encouraging a culture of knowledge sharing and learning, organizations can foster employee growth and adaptability, ensuring they remain competitive in a dynamic industry.

vii) **Informed decision-making:** Effective decision-making in energy and mining companies requires access to comprehensive and reliable information. Combining tacit insights with explicit data allows for a more holistic understanding of complex issues that facilitate informed and strategic decision-making at all levels of the organization.

In summary, managing both tacit and explicit knowledge is instrumental for energy and mining companies to enhance productivity and innovation, improve operational efficiency, mitigate risks, adapt to market changes, and foster continuous learning and development. By leveraging these types of knowledge effectively, organizations can optimize performance and drive sustainable growth in a highly competitive industry.

The implications for energy and mining companies not implementing KM can be profound and wide-ranging, affecting various aspects of their operations, competitiveness, and sustainability. Several instances are comprehensively identified, but not limited to:

i) **Missed opportunities for innovation:** KM fosters innovation by leveraging employees' insights, experiences, and ideas. Without a structured approach to capture and share knowledge, energy and mining companies may miss out on innovative solutions to operational challenges, technological advancements, and market opportunities.

ii) **Loss of critical knowledge:** Energy and mining companies operate in complex environments with unique technical requirements and safety considerations. Failure to implement KM can result in the loss of critical knowledge held by experienced employees. This includes tacit knowledge about equipment maintenance, safety protocols, and troubleshooting techniques, which is essential for operational continuity and risk management.

iii) **Reduced operational efficiency:** Effective KM streamlines workflows by providing employees with easy access to relevant information and best practices. Without it, employees may spend unnecessary time searching for information, duplicating efforts, or making decisions based on incomplete or outdated data. This can lead to inefficiencies and increased operational costs.

iv) **Higher risk exposure:** Energy and mining companies are subject to stringent regulatory requirements and safety standards. Inadequate KM can compromise compliance efforts, increasing the risk of accidents, environmental incidents, and regulatory penalties. Lack of access to critical information about regulations and standards can also hinder proactive risk management.

v) **Limited employee development and retention:** KM contributes to employee development by facilitating continuous learning and skill enhancement. Without a culture of knowledge sharing and development, employees may feel undervalued and lack opportunities for professional growth. This can impact morale, job satisfaction, and ultimately, employee retention.

vi) **Ineffective decision-making:** Knowledge-driven decision-making is essential for strategic planning and resource allocation in energy and mining companies. Without comprehensive KM practices, decision-makers may lack access to timely and accurate data, leading to suboptimal decisions and missed opportunities.

vii) **Difficulty in succession planning:** Energy and mining companies face challenges related to an aging workforce and potential knowledge gaps due to retirements. Without KM processes in place, there is a risk of losing critical expertise when experienced employees leave the organization. This can disrupt operations and complicate succession planning efforts.

viii) **Lack of customer focus and market adaptation:** Knowledge about customer preferences, market trends, and competitive landscapes is essential for adapting products and services to changing market demands. Without effective KM, energy and mining companies may struggle to anticipate market shifts and align their offerings with customer needs that result in lost market share and reduced competitiveness.

ix) **Inefficient collaboration and communication:** KM promotes collaboration and information sharing across departments and teams. Without it, silos can form within the organization, hindering communication and collaboration on cross-functional projects. This can impede innovation and limit the organization's ability to leverage collective expertise.

x) **Missed opportunities for continuous improvement:** KM is a cornerstone of continuous improvement initiatives in energy and mining companies. Without a systematic approach to capturing lessons learned and implementing feedback, organizations may miss opportunities to optimize processes, enhance performance, and drive sustainable growth.

In summary, the implications of not implementing KM in energy and mining companies extend beyond operational inefficiencies to encompass risks related to safety, compliance, innovation, employee development, and market competitiveness. To thrive in a rapidly evolving industry, energy and mining companies must prioritize KM as a strategic imperative to harness their collective intelligence and drive long-term success.

FIGURE 1

MAP OF MONGOLIA

Source: Worldometer.org [1].

The APO's project "Development of Demonstration Companies on Productivity Improvement in Energy and Mining Sectors through KM" was implemented in Mongolia from April to November 2023. Three companies from the energy and mining sectors participated, namely, Erdenet Mining Corporation (EMC), Cable Utilization and Maintenance Centre (CUMC), and Thermal Power Plant No. 3 (TPP3). These organizations have been involved in charting the productivity activity in Mongolia for 15–20 years with Mongolian Productivity Organization (MPO). All of the companies have mastered basic productivity tools and certified with quality standards. They are planning to move on to implement KM for innovation and productivity growth.

Cable Utilization and Maintenance Company (CUMC) and Thermal Power Plant No. 3 (TPP3) are both located in the Mongolian capital city of Ulaanbaatar while Erdenet Mining Corporation (EMC) is located in Erdenet, about 245 km from the capital.

Timeline of KM Implementation

There are four phases of KM implementation in Mongolia, from April to November 2023. Prior to the first meeting in April 2023, an online meeting was held with all three companies, attended by the management team and staff of the companies. The big picture was for the staff or heads of departments to realize they can be productivity champions of the organizations.

The objective of phase one was to convince the leaders and staff to understand the importance of KM and embark on its journey. For example, addressing the questions of "What, Why, When, Where, and How?" may involve the principles of change management. In change management, focusing on soft issues, such as culture, leadership, and motivation, are crucial. These elements are important for success, but managing them alone is not sufficient to implement KM projects. Soft factors do not directly influence the outcomes of KM programs. For instance, visionary leadership is often vital for transformation projects, but not always. The same can be said about communication with employees. Moreover, it is not easy to change attitudes or relationships because they are deeply ingrained in organizations and people. And although changes in culture or motivation levels can be indirectly gauged through surveys and interviews, it is tough to get reliable data on soft factors.

Change management is defined as the methods and manners in which a company describes and implements change within both its internal and external processes. This includes preparing and supporting employees, establishing the necessary steps for change, and monitoring pre- and post-change activities to ensure successful implementation.

Significant organizational change can be challenging. It often requires many levels of cooperation and may involve different independent entities within an organization. Developing a structured approach to change is critical to help ensure a beneficial transition while mitigating disruption.

Changes usually fail for human reasons: the promoters of the change failed to address the healthy, real, and predictable reactions of normal people to disturbances in their routines. Effective communication is one of the most important success factors in effective change management. All involved individuals must understand the progress through the various stages and see results as the change cascades.

At the first stage, creating awareness on what KM is, its importance, and how KM can positively impact the organization is very important.

The MPO has created an online KM assessment tool based on the APO KM assessment tool, which has been translated into Mongolian language. The companies are required to create an account, and they can use the KM assessment tool to conduct surveys in their respective organizations (Figure 2).

Following the meeting in April 2023, the results were collected and analyzed. Then, KM teams discussed the KM projects which can be divided into three categories, short-term, medium-term and long-term projects.

The KM implementation timeline can be summarized in Figure 3.

FIGURE 2

MONGOLIAN PRODUCTIVITY ORGANIZATION LOGIN PAGE

Source: Mongolian Productivity Organization [2].

FIGURE 3

THE KM IMPLEMENTATION TIMELINE

Source: Prepared by the author [3].

Overview Of KM

APO KM Framework

The APO Knowledge Management Facilitators' Guide (KMFG) was first published in September 2009. After 10 years, several major developments in KM took place worldwide, along with changes in how the APO views productivity and related issues. To reflect those developments, several aspects of the APO KM Framework had to be updated.

The latest edition of the APO KMFG, published in 2020, aims to provide trainers and consultants in National Productivity Organizations (NPOs) and elsewhere with a better understanding of KM so they can guide others in its implementation. The guide is accompanied by a file of ready-to-use presentation

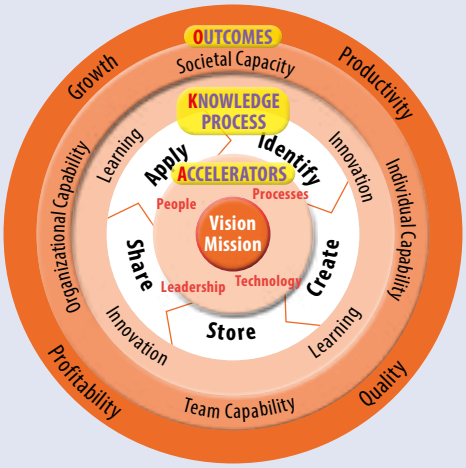
slides for KM facilitators which can be customized to meet specific needs. It contains easy-to-follow instructions on delivering training under the APO KM Framework, including detailed notes on the key messages of each slide, trainers' notes, and transitioning smoothly to the next slide with suggestions on timing. The aim of this edition of the guide is to reach a wide audience in the Asia-Pacific region and beyond to spread the KM message.

KM is a discipline focused on how organizations create and use knowledge. The expected outcome of KM initiatives is to enhance individual, team, and organizational capability and thereby increase social capacity. Together, these outcomes will spur overall productivity, improve the quality of products and services, and contribute to profitability and growth.

Therefore, a systematic, well-developed approach is required to achieve the desired purpose and it should integrate two components as part of the process, namely, identifying KM gaps and implementing KM initiatives. There is no standard format for this; rather, a developed framework that suits the organization's purpose is needed. Hence, organizations can refer to the APO KMFG to implement KM projects. The framework is depicted in Figure 4.

FIGURE 4

APO KM FRAMEWORK



Source: APO [4].

Outlining Your KM Implementation Strategy

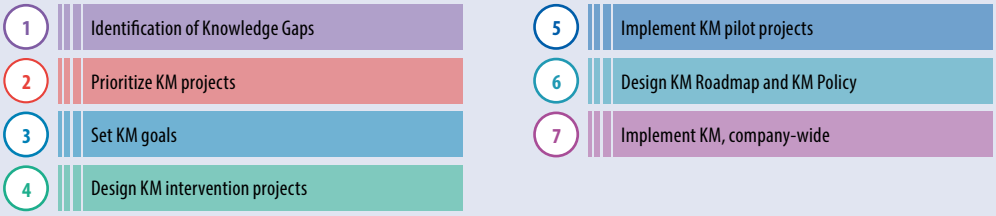
This is where the project management aspect comes into play, detailing delivery dates and milestones, success metrics, and expected changes to business processes. Several questions can be internally raised and explored. Will you roll out to different teams at different times? Will you have a pilot program? Will you be porting or syncing knowledge from a previous KM system? Will the organizational culture need to change? Should individuals expect the overall KM process to change? What is your long-term roadmap?

Steps for KM Implementation

There are seven steps that can be followed as a guide to implement KM in an organization, which are demonstrated in Figure 5.

FIGURE 5

STEPS TO IMPLEMENT KM



Source: APO [4].

Step 1: APO KM Assessment Tool for KM Readiness Assessment

The APO KM Readiness Assessment Tool survey questionnaire is designed to help the organization perform an initial and rapid self-appraisal of its readiness for KM.

The objectives of the KM Readiness Assessment Tool are to determine if KM practices are already being carried out in the organization in some form or another, and to what degree they are being applied. It also aims to identify the organization's strengths and opportunities for improvement in managing knowledge.

The questions are divided into seven categories (Cat) based on the APO KM Framework:

Accelerators:

- Cat 1.0: KM Leadership
- Cat 2.0: Process
- Cat 3.0: People
- Cat 4.0: Technology
- Cat 5.0: Knowledge Process
- Cat 6.0: Learning and Innovation
- Cat 7.0: KM Outcomes

Process to be followed

For each question, participants will (initially individually and then as a group) identify practices aligned with the question. These are recorded as "Strengths". If the organization lacks a program or process, for any of the questions, it can be recorded as an "Opportunity for Improvement." If a program exists but it is not carried out regularly, it can also be recorded as an "Opportunity for Improvement."

Step 2: Organizational Culture Assessment

In KM implementation, company culture is recognized as a driving force and a defining factor of successful KM application. Organizational culture supports two important areas: readiness to collaborate and trust between employees.

In order to improve KM implementation, the organization must be able to focus on empowering employees, stimulating transformational leadership skills, providing an environment for knowledge

transfer, learning from best practices and mistakes, offering effective rewards, and enhancing employee participation and engagement.

Knowledge culture in KM is a topic that managers need to discuss more. Despite the significant contributions that information technology has made to organizational success, the key to KM lies with humans, not computers. The collective "know-how" that supports major business decisions and ongoing business processes are referred to as organizational skills. These competencies ultimately determine competitiveness as they are required for establishing and executing market-winning strategies. Organizations must first identify and then develop the appropriate set of competencies.

Organization should assess employees' knowledge culture, such as common behavior patterns, positive and negative attitudes, or dysfunctional behaviors. The assessment should then provide some information about cultural issues affecting innovation, change, learning, information, and KM. How can an organization obtain these information? Conduct interviews with the employees, or send questionnaires related to knowledge culture in the organization.

Organizations may also visit the Straits Knowledge website for culture cards that can assist in conducting culture assessment [5] (https://www.straitsknowledge.com/store_new/km_diagnostic_cards/).

Step 3: Analyze the Results

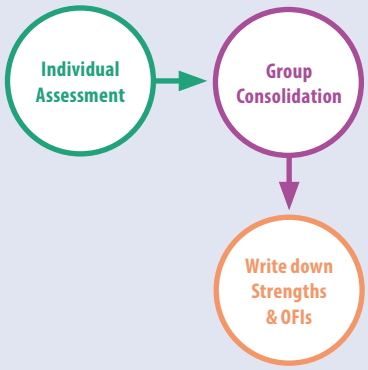
The KM Readiness Assessment is based on the APO KM Framework. It evaluates the organization on the Accelerators, Knowledge Processes, Learning and Innovation, and Outcomes. Organizations might not have a formal KM policy or process in place at the time of the assessment, but will demonstrate their KM readiness through existing programs, elements, or structures. The readiness assessment helps us identify these practices so we can build on them rather than reinventing the wheel.

Some organizations may not yet have an articulated KM policy or KM platform, yet knowledge sharing may already be happening in some form. This could include scheduled program designed for knowledge sharing, such as monthly talks, expert sessions, and external speaker sessions. The objective is to look at a broader picture and not be limited to a formal KM process or platform.

For example, the assessment can start at the individual level, followed by the group or department level. Each group will post a summary of Strengths and Opportunities for Improvement (OFIs) for each criterion category. The more convergence there is on the Strengths, the better it is for participants to understand that they have a solid base on which to launch a KM Initiative.

FIGURE 6

KM ASSESSMENT FLOW



Source: APO [4].

The OFIs will reveal the actions, competencies or skills building, or processes that the company needs to develop to enable individuals and teams to effectively share knowledge and deliver their promise to the customer. As there are overlapping questions across the categories, the group may want to revise their earlier responses, which is acceptable. In the end, a consolidated version will be generated for each criterion, containing both qualitative and quantitative scores. This is a key outcome of this exercise: assessing the KM readiness of the organization.

Organizational culture assessment

The Organizational Culture Cards map patterns of behavior in organizations related to change management, developing innovation, becoming a learning organization, or implementing information and KM initiatives.

There are 12 possible uses for these cards:

i) Diagnosing culture

ii) Communicating values

iii) Evaluating culture change

iv) Personas to anticipate user needs

v) Designing change messages

vi) Change poker

vii) Supporting teamwork

viii) Leadership development

ix) Problem solving

x) Narrative sharing and capture

xi) Competency management

xii) Personal development

The deck is split into three types of behavior patterns: negative attitudes, dysfunctional behaviors, and positive attitudes. These cards are used to diagnose problems before they arise in the workplace [5].

Step 4: Identify Knowledge Gaps

Knowledge gaps are discrepancies between what employees know and what a company needs them to know. If a company does not have a reliable process for identifying these gaps, they can impede productivity, hinder cross-team communication, and negatively impact the employee experience, and harm the organization's bottom line.

After conducting the organization’s KM Readiness Assessment and identifying the Strengths and OFIs, the organization is now better positioned to develop the business case for KM.

Review the Group Significant Findings Matrix by category. For each category, participants should distill the Strengths into four or five key points and do the same for the OFIs. This is basically to summarize the findings into manageable lots.

Some consultants prefer to rank the OFIs. While this is a good idea, it often generates too much debate as participants have different perspectives. Additionally, organizational considerations may influence what should become a priority, so this must be observed during the consolidation.

FIGURE 7

STRENGTHS AND OPPORTUNITIES FOR IMPROVEMENT MATRIX

CATEGORY	STRENGTHS	OPPORTUNITIES FOR IMPROVEMENT
CAT 1.0 KM LEADERSHIP		
CAT 2.0 PROCESSES		
CAT 3.0 PEOPLE		
CAT 4.0 TECHNOLOGY		
CAT 5.0 KNOWLEDGE PROCESS		
CAT 6.0 LEARN & INNOVATION		
CAT 7.0 KM OUTCOMES		

Source: APO [4].

Before building the significant impact project for KM, it is important to consider the views of the leadership team. They may have some constraints, irritants, or crucial business needs that they want KM to focus on. As the leadership team sponsors any KM effort, it is important to take their concerns on board when proposing KM projects. This also strengthens the support given to KM. Once the leadership team has provided their input, it is easier to use the ABC Model to put together a coherent KM Plan.

Step 5: Prioritize KM Projects

Two "Golden Questions" are used to prioritize KM projects:

1. What is the key issue (business goal, organizational climate, societal impact, productivity, profitability, growth, etc.) that you want KM to address?
    - KM needs to align with the key organizational challenges
    - By aligning with the organization's strategy, KM is also seen as a must-have function
2. When will you say that implementation of KM has met your expectations? What are the indicators that will signal it has succeeded?
    - The answers will provide the focus areas for developing the KM Strategy

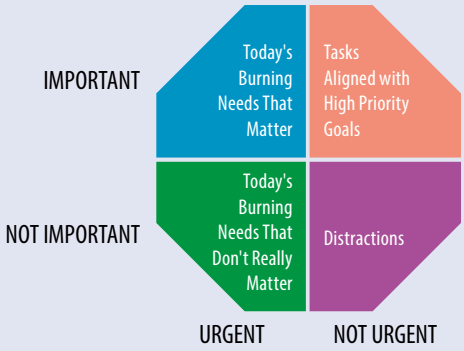
This tool can be as simple as a quad chart proposed by Stephen Covey [6] (Figure 8).

Four criteria are used for prioritizing projects:

- Impact on and importance to the business
- Demonstrable results from successful implementation
- Availability of a champion with resources
- Maximum opportunity for learning

FIGURE 8

QUAD CHART



Source: Covey [6].

Step 6: Set KM Goals

In general, the goal of KM is to improve a company's efficiency and retain knowledge within the organization. It involves sharing perspectives, ideas, experiences, and information; to ensure that these are available in the right place at the right time to enable informed decisions; and to improve efficiency by reducing the need to rediscover knowledge.

FIGURE 9

SETTING KM GOALS

Source: APO [4].

The following is an example for the aspect of benefit:

Benefit potential - What results can be achieved? What are the potential returns?

- **Information and knowledge benefits:** Faster retrieval of vital information, getting access to expertise, and centralized access to all required information, such as in a portal
- **Intermediate benefits:** Minimizing duplication, sharing knowledge across the organization, and getting new hires up to speed faster

- **Organizational benefits:** Reducing costs, increasing productivity, and fostering innovation
- **Customer and stakeholder benefits:** Better products and services, higher quality, and better value

FIGURE 10

EXAMPLE MATRIX DIAGRAM FOR PRIORITIZING KM PROGRAMS

1	2	3	4	5	6	7
KM Program	**Criteria for Prioritizing Programs**				**Total Points**	**Rank**
	Impact on business 1–10	*Demonstrable results 1–10*	*Availability of resources 1–10*	*Maximum opportunity for learning 1–10*		

Source: APO [4].

Step 7: Design KM Intervention Projects

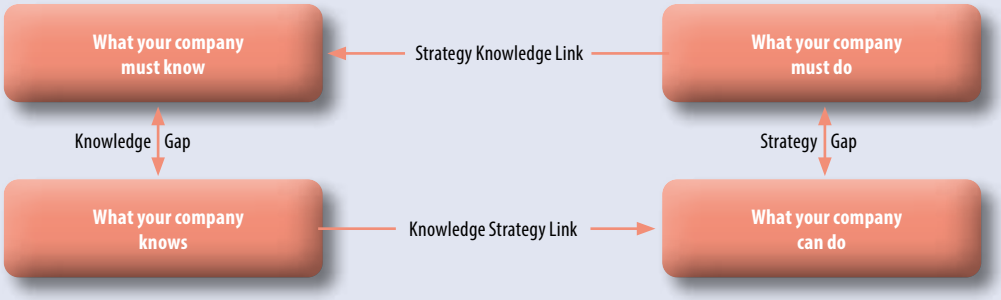
The KM intervention projects can be carried out with the following steps:

1. Develop a KM strategy

A KM strategy is a plan that describes how an organization will manage its knowledge better for the benefit of the organization and its stakeholders. A good KM strategy is closely aligned with the organization's overall strategy and objectives.

FIGURE 11

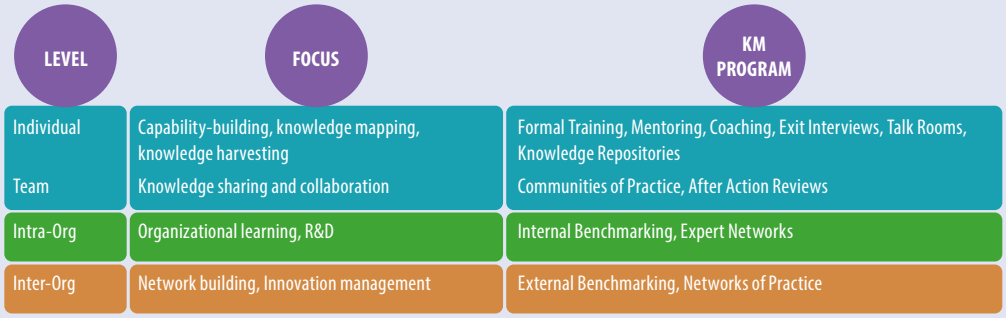
STRATEGIC KNOWLEDGE GAP ANALYSIS



Source: APO [4].

FIGURE 12

POTENTIAL KM PROGRAMS



Source: India Innovation Index 2021.

2. Identify potential programs

Depending on the focus of the KM Program and the level of implementation, there are many KM programs, initiatives, and practices that can be adopted by an organization, either individually or in combination.

Some additional information or definitions of the above KM programs are as follows:

- Capability building includes training which can take the form of formal classroom training, on-the-job (OJT) training, or mentoring and coaching
- Knowledge mapping involves taking an inventory of the organization's knowledge assets, identifying who has the knowledge, where it is located, and how this knowledge flows from the source to the receiver
- Knowledge harvesting captures and codifies knowledge, especially tacit knowledge, from people who are about to leave the organization, be promoted to another position, or be detailed/assigned/seconded to another post in the organization. This ensures that knowledge transfer takes place to minimize loss of knowledge
- Talk rooms are venues for socializing, especially among R&D staff. These random conversations are expected to create value for the organization
- After Action Reviews (AARs) have already been discussed in previous modules. Other names for this are Lessons Learned Meetings and Debriefing. AARs review an activity after its completion and use the results to improve the succeeding activity or next implementation of that activity
- Internal Benchmarking involves comparisons made within the same organization, such as other departments, factories, or plants at other sites, or other companies within the same group or conglomerate. Benchmarked are common areas of interest, including implementation of 5S, Quality Circles, ISO 9000, TQM, and other quality management programs as well as human resource development and financial management
- In Expert Networks, an organization should be part of a network where it can access experts for help. It is crucial to know who knows what and where they can be found, especially when you need them most

- External Benchmarking compares the performance of a process with other organizations, not necessarily just from the same industry or sector, but more from those outside of the determined industry or sector. This is where breakthroughs occur and where the organization can focus on achieving innovation
- Networks of Practice are like Community of Practices (CoPs), but the membership is interorganizational. Members are people with similar functions from different organizations within the same industry or sector. They share experiences and exchange best practices on a benchmark topic to gain useful knowledge that will help them improve their organizational performance or achieve exceptional performance. For example, CUMC is implementing a KM project on electrical cables specifications, whereby the members are from different companies whose work processes are related to each other in the energy industry in Mongolia

Case Studies

Cable Utilization and Maintenance Centre (CUMC)

Company Overview

CUMC is responsible for managing and ensuring the operation of electrical power cables throughout the entire power distribution process. As the safety of cables directly impacts people's lives, properties, and businesses, it is vital to have KM projects for the operation and maintenance of electrical power cable. The company is currently undergoing a merger in its operations.

The entity is a part of Ulaanbaatar Electricity Distribution Network, a state-owned joint-stock company, which is one of the leading players in the domestic energy market, providing individuals and businesses with highly efficient solutions across eight districts of Ulaanbaatar and 16 soums (subdivisions) of Tuv provinces. The company serves nearly half of Mongolia's population, or 260,000 targeted customers, including businesses and the general public.

Background

CUMC, established on 1 October 2021, faces some issues on sharing knowledge and different understanding of the work procedures because employees are combined from four different units. Based on the survey, lack of trust and teamwork among employees was apparent. The main reason could be due to the fact they do not know each other. Hence, it faces challenges in aligning organizational culture among employees, especially knowledge culture, aligning work procedures, and expediting knowledge sharing to retain institutional knowledge.

Project Implementation and Achievements

Eight KM projects were identified: (i) mentor-mentee program; (ii) podcast project; (iii) learning innovation project; (iv) socialization project; (v) establishing an information channel, (vi) developing CUMC operational procedures; (vii) updating existing procedures; and (viii) knowledge sharing with external organizations.

A culture survey was conducted before and after the KM programs. Results show that 85% of employees now have a positive attitude toward knowledge sharing and better working relationships. Consequently, this environment improved the company's productivity.

KM projects have shown achievements in various forms, such as developing standards for cable installation and utilization works, whereby the new technical standards are to be followed throughout Mongolia. CUMC has prepared 10 technical requirement specifications, updated 13 documents applicable to the companies, and five communication channels for internal information dissemination that have been created to make it easier for employees to access job-related information and procedures, even when they are at remote sites.

For example, implementing a mentor-mentee program can significantly enhance knowledge sharing, particularly for tacit knowledge in the cable utilization industry. Tacit knowledge, which is often difficult to articulate and codify, can be effectively transferred through mentorship. The mentor-mentee program facilitates the transfer of tacit knowledge, specifically through experiential transfer. In industries like cable utilization, experienced employees possess valuable tacit knowledge gained through years of practice. Mentors, who are typically senior or seasoned professionals, can share their insights, techniques, and nuanced understanding of cable design, installation, maintenance, and troubleshooting with mentees. This experiential knowledge is difficult to capture in manuals or documents, but is crucial for success in the field.

Tacit knowledge often relates to specific skills and competencies required in cable utilization, such as problem-solving during installations or diagnosing faults in cable networks. Through mentorship, mentees can observe and learn these skills firsthand from mentors who have mastered them over time. This hands-on learning accelerates skill development and proficiency.

CUMC has implemented KM beyond their company, which can be referred to as interorganizational knowledge transfer. Interorganizational knowledge transfer involves sharing of knowledge and information between different organizations within the cable utilization industry and is crucial for several reasons, such as access to specialized expertise. Interorganizational knowledge transfer allows companies to tap into specialized expertise that may not exist internally. This could include accessing knowledge from industry associations, research institutions, or other companies with unique skills or experience in specific aspects of cable design, manufacturing, or installation. Moreover, it fosters innovation and technological advancement. Knowledge sharing between organizations exposes companies to new ideas, technologies, and emerging trends in the cable industry. Collaborative research and development initiatives can lead to breakthrough solutions that benefit the entire industry.

In CUMC, the knowledge management programs include supplier knowledge development and supplier communication. CUMC invited the suppliers to join their knowledge sharing programs. Hence, the organizations achieve greater benefits in managing quality and productivity. Especially, in a turbulent environment, effective supplier communication plays an important role to ensure a positive impact on quality performance and innovation.

Key Takeaways

Lessons learned from KM implementation in CUMC are as follows:

i) **Capture and consolidation of knowledge:** KM facilitates the systematic capture of knowledge from both companies, including processes, procedures, best practices, and lessons learned. This ensures that valuable knowledge from each organization is not lost during the integration process.

ii) **Knowledge sharing and collaboration:** By implementing knowledge-sharing platforms and tools, employees from both companies can easily collaborate and share their expertise, fostering a culture of learning and encouraging employees to contribute their knowledge to the collective pool.

iii) **Standardization of processes:** KM helps identify redundant or inefficient processes and standardizes them across the combined entity. This ensures consistency in operations and eliminates confusion among employees who may be accustomed to different ways of working.

iv) **Training and onboarding:** KM systems can develop training materials and resources for employees transitioning to the combined company. This helps in familiarizing them with new processes and procedures, reducing the learning curve, and improving productivity.

v) **Continuous improvement:** Through KM, organizations can continuously evaluate and improve their work processes based on feedback, performance data, and emerging best practices. This allows the combined company to adapt to changing market conditions and maintain a competitive edge.

vi) **Cultural integration:** KM plays a vital role in cultural integration by promoting transparency, open communication, and collaboration among employees from different backgrounds. This helps in building trust and fostering a sense of unity within the combined organization.

vii) **Risk management:** By centralizing knowledge related to compliance requirements, regulatory standards, and risk management protocols, KM helps mitigate risks associated with the integration process.

In essence, KM serves as a strategic enabler for harmonizing work processes during the consolidation of two companies. It facilitates the seamless transfer of knowledge, fosters collaboration, standardizes processes, supports employee training and onboarding, promotes continuous improvement, and enhances risk management.

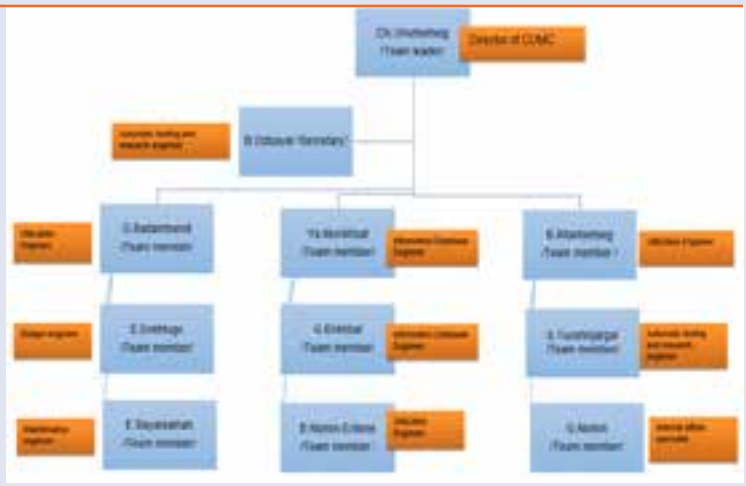
FIGURE 13

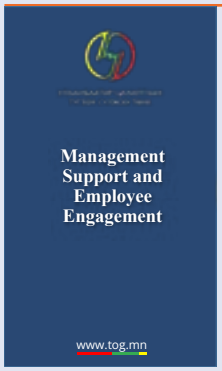
PROJECT SUMMARY OF CUMC

Project rationale, objective importance

- To share the knowledge among employees gathered from different units so they can learn from each other, to convey the theoretical and practical knowledge of technical engineers to employees, and provide apprenticeships
- Dissemination of knowledge created at CUMC to external organizations
- Keep knowledge accessible to people by storing, documenting, digitizing and storing it in the cloud system

Project management team





From the cable maintenance management team, Head of the utilization and maintenance unit and the technical engineers joined the knowledge management team. From CUMC, the management team participated with 100% support.

The employees actively and evenly participated in the tasks, research works and activities organized by the KM team. KM team was able to engage 95 percent of the employees in the events organized by the team. Total of 60 employees in duplicated number took part in the KM events.

Information about the start of the project implementation at CUMC was published on the public media of the UBEDN /HQ/ and disseminated through the telegram group and social media used by all employees.

Information about the Mentor and mentee program and other general information was delivered to employees of UBEDN through the company's Able page. During the implementation of the project, the employees of other centers/units of the company expressed their interest in participating in the project.

The company's management has positive expectations towards the implementation of the project.

Work to be done within the company:

- Include KM-related responsibilities in the employee's job description
- Appoint the person in charge of KM operations within CUMC
- Organize best practice sharing activities with other units which requested, or interested in the KM project
- Include the KM project in the mid-level organizational development planning
- Train new staff members to always formally sign a mentor-mentee contract
- Organize podcasts and tik tok contests to promote mentors at regular intervals to engage more people

Work outside the company:

- Regularize the training course for cable couplers, aiming to have as many professional couplers at companies as possible
- Publicly disclose all technical specification requirements necessary for cable maintenance and installation, convert them to electronic format and publish on our website and facebook page
- Regularly organize an information and knowledge exchange day at the beginning of every year to inform the installation and design organizations about newly introduced technology. Set a standard of inviting teachers and scientists from Energy school of Mongolian University of Science and Technology, and other universities

- The employees from the 4 different units that came under one center were able to understand and accept each other in a short timeframe
- At the initial stage of the project, the cultural card survey was conducted at each section of CUMC and the results showed the issue in the relationship between the staff of the two sections, therefore more focus was made on those sections. At the end of the project, when the survey was conducted again, the indicators showed the improvement from the previous results, and 85% of the organization's employees are now have a good attitude and relationship
- According to the results of the survey, it is perceived that the remaining 15% of employees lack good communication and knowledge and information is unclear, and it can be seen that a plan to improve the relationship between these employees needs to be developed and pay more attention to them

- Basic works have been carried out to make unified standards for cable installation and utilization works, to embed new technical and technological information into organizational standard, and make it as IEC standard to be followed throughout Mongolia
  - Organizational standard
  - 10 technical requirement specifications
  - Update 13 documents applicable to the company
  - 3 procedures to be followed by CUMC is now being amended
- 5 communication channels for internal information dissemination have been created. Job and other related information can be retrieved now from these channels
- In order to make all information related to the cable maintenance, installation, and utilization of the UBEDN JSC available to users, suppliers, and other license holders, the above-mentioned documents are stored and distributed on the web page, able program, and other electronic forms

- First steps are taken to disseminate knowledge to external organizations, which in turn attracted the attention from other units, thus creating conditions to attain knowledge management concept
- Discussions began about the possibilities of delivering trainings via online platforms to employees from many professional organizations
- Suggestions received to translate the video lessons and make our own video lessons as well
- Training course topics and teaching staff have been created to prepare professional couplers

23 mentees who would like to be mentored were identified by asking 16 teachers' opinions. These instructors will provide their students with about 30 types of skills.

Mentor and mentee took the oath of allegiance on the official "Mentor mentee contract ", which reflects the work and duration of the study. The mentor-mentee contract signing and organizing open day were regulated.

In CUMC, the beginning of Mentor mentee project implementation is announced through headquarters' information channels

The UBEDN provided mentor-mentee project information and other general information to the company's employees through the ABLE page. The company has a total of 1,900 employees and about 30% of them have computers. If the information reached 396 employees, it reached up to 70% of the company's executives.

All procedures in force in the company were studied and procedures related to distribution were distinguished. Out of the 27 procedures related to distribution activities, 14 regulations are the procedures applicable to CUMC.

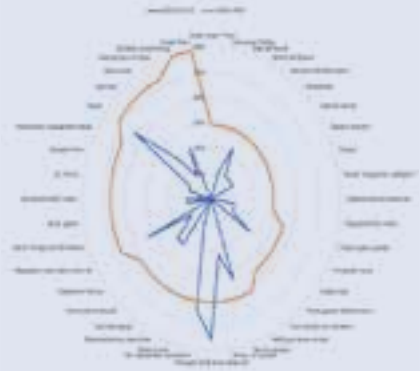
An official letter was submitted to the Distribution and policy planning department stating that 13 provisions of the 14 regulations to be followed by the CUMC need to be amended. The company is working on a reforming the rules.

11 pieces of Technical requirements are developed and prepared. (4x is a tool TRD.) The two cable regulations were converted into electronic versions and posted on the company web page, and the information was provided for employees and outside visitors.

Joint assembly instructions can be viewed from the Tog.mn-User Corner-Recommendation menu

UBEDN organized a career competition. All employees of the CUMC departments were divided into 5 teams and competed for 20 days.

The team that won the competition was rewarded by a headquarters with a cash prize. During 20 days, it worked very productively to restore 176 damages of 153 cables. Relations among employees have improved.

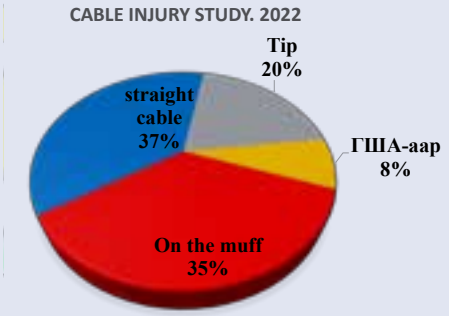


Socialization: Comparison of Cultural Research Study Results

- Looking at the graph of the cultural research results, the nature of the organization's staff at the beginning of the study was not fully recognized, While most employees were in a lost position in a maze, the latter study concludes that many behavioral patterns have been unlocked
- Although the behavior of the backstabbers have declined, the high percentage / 41%/ is not a good indicator, and it shows that in the future, we need to pay close attention to the social problems of employees
- The graph also shows that the team's performance, which has increased confidence in the management of employees, has improved

Cable injury

In 2022, a cable injury survey found that 35 percent of all injuries occurred on the muff during the assembly and repair. In other words, 35 percent of the injuries we are working on to recover are caused by our mistakes. Muff injury depends on a number of things, including the quality of the muffs, the skills of the employees who are assembling them, and the natural conditions, but there will be a condition to not cause defects if we make a qualitative muff.

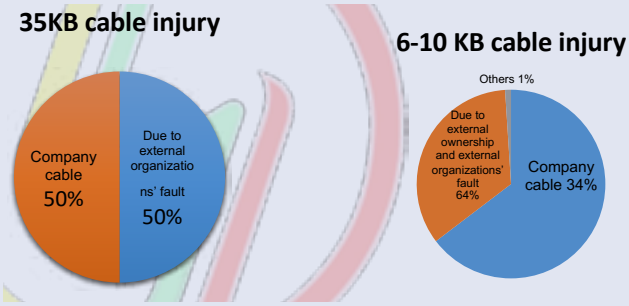


The next graph may explain the need for the licensee to assist other companies specializing in cable utilization and maintenance, and to provide them with a distribution of necessary manuals and technical requirements for the preparation of professional staff.

The graph shows the 2023 cable line rupture study:

50 percent of the total 35 kV rupture was damaged by an external organization's fault or the poor quality of their utilization.

35 percent of the 6-10 kV cable was also damaged for the same reason.



In 2023, the following training was provided to other UBEDNs and to the staff of the CUMC.

- Supply staff and design department engineers were invited to the cable training
- Introduction was made to the engineers of the Technical Policy Department and other relevant departments
- Information and training were provided to information and reference employees
- Muff's mentors are taught 11 types of specialties for cable muffles. There were three internships
- In the future, incomplete lessons need to be included and the training needs to be fixed

As part of the knowledge distribution project

In collaboration with energy design, training was provided to staff from external organizations. Other installation and drawing license holders involved 36 engineers and technicians from 25 organizations.

As part of the knowledge distribution project

In the future, lessons need to be prepared electronically and made available to the public, and cable usage textbook standards need to be enriched to store them in the cloud electronically.

Source: CUMC [7].

FIGURE 14

PURSUING KM IN CUMC

Source: CUMC [7].

Erdenet Mining Corporation (EMC)

Company Overview

EMC is located in Erdenet, a city built in 1974 to capitalize on Asia's largest copper ore deposit and home to the world's fourth-largest copper mine. The company is one of Mongolia's state-owned enterprises. EMC mines about 22.23 million tons of ore annually, producing 126,700 tons of copper and 1,954 tons of molybdenum. The mine accounts for 13.5% of Mongolia's GDP and 7% of its tax revenue while employing about 8,000 people.

EMC's mission is to ensure sustainable development, practice responsible mining, and create national wealth. The company values three pillars: its society, the economy, and the environment. EMC respects the rights of stakeholders, particularly those living in the region, without compromising the needs of future generations. Operations are based on knowledge and experience that safeguard the environment and human health, act lawfully and transparently, and bring development benefits to all.

Background

As a large corporation with thousands of employees, EMC faces challenges in preserving institutional knowledge, maintaining constant innovation, and improving productivity and product quality. EMC has proposed four KM projects based on the APO KM Assessment Tools [4] and culture assessment [5]. But for the purpose of this case study, only one project will be highlighted which is "Improving the Understanding of Technological Knowledge" from team Alfa PQC.

Project Implementation and Achievements

The objective of this KM project is to create a unified approach and instructions for adjusting the distance between crusher discharges. The team collected and analyzed data on crusher breakdowns and downtime. They discovered that productivity could be improved through practice, experience, knowledge, and proper equipment usage. EMC organized trainings, mentor-mentee programs, updated procedures, and provided easy access to standards with clear instructions.

For example, after five months of implementing the KM project, employee knowledge and skills in crushing activities improved. Clear instructions for adjusting the distance between the crushers are established, making the crushing process more efficient. As a result, the total amount of ore (the raw material) processed was reduced, client fulfillment plan was ensured, and a positive effect on grinding and enrichment.

Efficient communication in large companies like EMC plays a crucial role in supporting and enhancing KM initiatives. KM aims to capture, store, share, and leverage organizational knowledge effectively, and efficient communication is fundamental to achieve these objectives. For example, under knowledge sharing, efficient communication via e-office and other KM platform facilitates the sharing of tacit and explicit knowledge among employees, teams, and departments. By ensuring clear, timely, and open communication channels, employees are encouraged to share their expertise, experiences, and insights with others, enriching the organizational knowledge base.

In addition, effective communication fosters collaboration and cross-functional learning within companies. When teams from different departments communicate efficiently, they can leverage each other's expertise, solve complex problems, and share best practices, leading to continuous learning and knowledge creation.

Good communication practices also encourage innovation and idea generation by enabling employees to exchange ideas, provide feedback, and participate in brainstorming sessions. This collaborative environment promotes innovation by sharing diverse perspectives and insights, leading to new ideas and solutions.

Key Takeaways

Lessons learned for mining companies are as follows:

i) **Documenting best practices and lessons learned:** Encourage employees to document their experiences, best practices, and lessons learned in mining operations through reports, case studies, and/or knowledge-sharing sessions. A centralized repository for such information allows easy access and retrieval by employees.

ii) **Implementing KM systems:** Invest in KM systems that facilitate the organization, storage, and retrieval of institutional knowledge, such as databases, intranet portals, or specialized software tailored to the mining industry. Ensure these systems are user-friendly and accessible to all employees.

iii) **Cross-training and mentoring programs:** Establish cross-training initiatives where employees from different departments or levels of expertise share their knowledge and skills with others.

Additionally, implement mentoring programs where experienced employees mentor newcomers, passing on their knowledge and expertise.

iv) **Regular training and development programs:** Offer regular training and development programs to employees to enhance their skills and knowledge in various aspects of mining operations. This could include technical training on equipment, safety protocols, environmental regulations, or leadership and management skills.

v) **Encouraging collaboration and communication:** Foster a culture of collaboration and open communication within the organization. Encourage employees to share their ideas, experiences, and insights through team meetings, brainstorming sessions, or online collaboration platforms to harness collective intelligence of the workforce.

vi) **Capturing tacit knowledge:** Recognize that not all valuable knowledge is explicit and documentable. Encourage employees to share their tacit knowledge, which is often gained through years of experience and intuition, through informal conversations, storytelling sessions, or knowledge-sharing events.

vii) **Creating communities of practice:** Establish communities of practice within the organization, where employees with similar roles or interests can come together to exchange ideas, solve problems, and share knowledge. These communities provide a platform for peer learning and collaboration.

viii) **Incentivizing knowledge sharing:** Recognize and reward employees who actively contribute to the sharing and dissemination of institutional knowledge with incentives, such as bonuses, awards, or recognition programs.

ix) **Continuous improvement and feedback mechanisms:** Regularly review and update existing processes and procedures based on feedback from employees and stakeholders. Encourage employees to provide suggestions for improvement and incorporate these suggestions into organizational practices.

By implementing these strategies, mining companies can improve institutional knowledge, enhance operational efficiency, foster innovation, and maintain a competitive edge in the industry.

KM offers significant benefits to EMC. It positively impacts their operations through increased knowledge content, facilitating innovation, and organizational learning.

KM facilitates innovation by promoting collaboration, idea sharing, and cross-functional learning. KM enables EMC to leverage expertise across different departments and teams. Since the company has many employees, among the challenges is to identify the expertise and get them to work for higher productivity.

FIGURE 15

PROJECT SUMMARY OF EMC

PROJECT PERFORMANCE

AA total of 4 tasks were selected as part of the Lessons learnt project, but 2 of them were chosen to be continued for further implementation. It includes:

1. Creation of a unified standard for symbols and number fonts for all equipment used in the Concentrator
2. Since the bolts and nuts of the latest main and auxiliary equipment supplied to the concentrator are of non-standard sizes, implement the work of providing suitable special battery impact wrenches and keys and include them in the 2024 order.

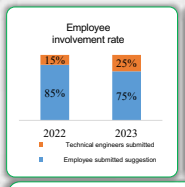
Project performance depends on the tasks of defining, creating, storing, and sharing the "knowledge process" phase.

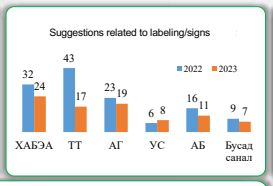
1. INCORPORATION IN UNIFORM STANDARDS

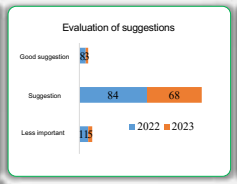
CURRENT SITUATION

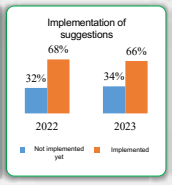
The ISO3098-6:2003 standard shall be used for addressing and numbering of main and auxiliary equipment.

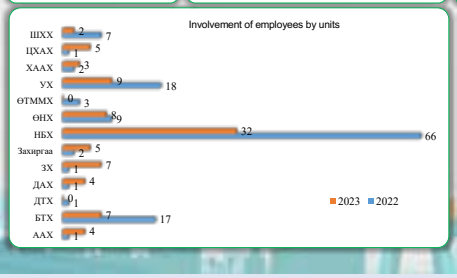
1. THE RESULTS OF THE RESEARCH OF INCORPORATION IN THE UNIFORM STANDARDS











In 2022, 85% of the proposals related to signs and markings were made by staff and 15% by Engineering technical workers, while in 2023 this ratio was 25:75.

In 2022, 7.5% of the total votes of concentrator employees and 6.1% of the total votes in the first 9 months of 2023 were related to signs, which is a decrease of 1.5%.

In terms of vote ratings, 84% were simple votes in 2022 and 68% were simple votes in 2023.

As of the first 9 months of 2023, the implementation of proposals related to workplace signs and markings is 66%.

The active participation of employees of Crusher concentrator Section in the proposal is high.

1. WORK RESULTS

By setting up labeling of concentrator equipment in a unified standard:

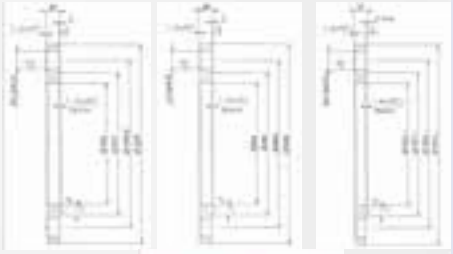
- Conforms to Mongolian MNS ISO 3098-6:2003 standard.
- By standardizing addressing, the foundation is laid for the organization to set subsequent standards.
- Conditions have been created to ensure that problems related to addressing will not occur again or be repeated.
- Addressing is done in a variety of ways, depending on the resources available to the bidders and the PQC. In this, it is arranged that the expenses are more than the bonus of PQC, the printing costs of the workshop, and the paint that is available in the warehouse at that time.
- In connection with the standard, it is possible to order the necessary materials.
- In the last 2 years, 2.6 million MNT bonus was given for this type of offer. In the future, this bonus can be spent on other types of initiatives and activations.
- One of the standards of address marking is becoming a new important knowledge of product and service.
- The appearance of the workplace has improved.
- Corporate culture has improved.
- A proposal for a subsequent or ASSESSED PROPOSAL EVALUATION process for the proposal system has been developed.

2. SUPPLY OF IMPACT WITH AN APPROPRIATE BATTERY AND WRENCH

Current Situation: Recently, the equipments supplied are hybrid bolted equipments which are not available in our factory. This makes maintenance difficult due to lack of matching keys.

Solution and implementation: The Bureau of Mechanics is preparing a technical drawing to change the valve flanges of 3 types (Ø150, Ø200, Ø250mm) corresponding to the pressure of the gas valves, and is working to order at the Repair Mechanic Factory.

Work results: We have included in the 2024 procurement plan for the purchase of battery-powered screwdrivers that match the specifications of the equipment.
- In this way, repair work will be facilitated, time will be saved, and there will be no need to carry many types of keys.
- The next major work is to propose a new proposal to make the mounting bolts of MillMax and SlurryMax pumps of the same type.



DIFFICULTIES FACED BY TEAM MEMBERS

1. Things learned from the project:

- It was interesting to see and discuss the problem from different perspectives because the team members have different professions.
- It was seen that equal participation of members is important in teamwork. For this reason, we consider that it appropriate to employ them in the project team, taking into account their interests.
- The participation, initiative and performance of all team members had a direct impact on the success of the project, so the need to further develop teamwork and creativity became visible.
- As a new employee, the opportunity to improve work performance by learning from the methods of colleagues were provided.



The things learned by team members

1. Things learned from KM project:

- Learned international project processes and requirements and how to implement the project from the mentors' advice and training.

2. Challenges occurred through the implementation of the project:

- As this project was carried out in addition to the main work, it was difficult to spend time when the workload was high.
- Since most of the team members were selected by official requirements rather than by choice, the effort did not exceed expectations.



PROJECT RESULTS

- Gained an understanding of knowledge management systems.
- Realized the potential of creating organizational important knowledge
- By having a single standard, it became possible to order ONLY NECESSARY inventory or to optimize inventory ordering, supply, and warehouse balance.

"Ensuring the integration of information" project

Implementor: Oyunlag team

Duration: May till November, 2023

Rationale (reason - requirements, project alignment with organizational strategy)

- There is no standard for communicating information and discussing common goals between employees/departments – 53.3%
- Due to the delay in information, there is still a lack of timely execution, the organization takes risks and loses opportunities.-36.7%
- Employees and departments take the attitude of "This is my priority" when dealing with other people's requests. – 36.7%
- People don't know what information is being stored, so they often duplicate or do unnecessary extra work. – 43.3%

Objectives (expected results)

- Improving the process of information transmission and ensuring the integrity of information

Process and project description (scope, planned activities)

1. Determining the current status of the internal information system of the CF
2. Determine the status of the e-office system of the factory
3. Conduct a comparative study of systems
4. Development of merger proposals

Project results

- Eliminate data outdate
- Ensure information security.
- Duplication of information will be eliminated.
- Information transmission and distribution will improve.
- Information transmission is guaranteed and will reach users through one source and channel.

Needs

- Since the integrated information system of the plant has been updated and the flow of information has become united, the internal system of the concentrator needs to be updated in line with the times.
- 82% of the 265 employees who participated in the survey felt that it is necessary to combine the 2 systems and have a single source of information.
- Out of f the 265 employees who participated in the survey, 140 employees or 52.8% considered the internal system of the concentrator to be difficult to use and outdated.

Challenges

- The internal network of the concentrator will reach all employees
- The internal structure is disorganized and there are too many steps to get information.
- Announcements and sources of information are sometimes unknown.
- Some unnecessary information (for example, overlap with factory information) adds to the system load.
- The concentrator's internal system is out of date, running Windows Server 2008 since 2008. The programmer who was in charge since 2020 was transferred to another workshop by the policy of the factory, which left the concentrator without an owner to take care of the internal system.

RESULTS OF THE RESEARCH ON INTEGRATION OF E-OFFICE AND INDUSTRIAL DEPARTMENT DIGITAL.ERDENETMC.MN SYSTEM /employees/

Needs to integrate **83.3%**

Needless to integrate **16.7%**

A total of 218 employees participated in the survey. Personnel involved in paperwork are granted access to the system. Access to the internal network of the production department is limited.

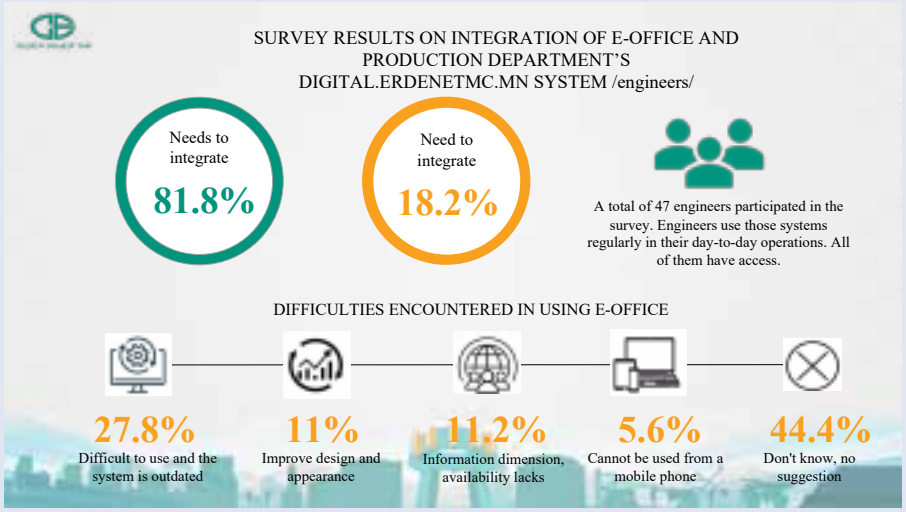
DIFFICULTIES ENCOUNTERED WHILE USING E-OFFICE

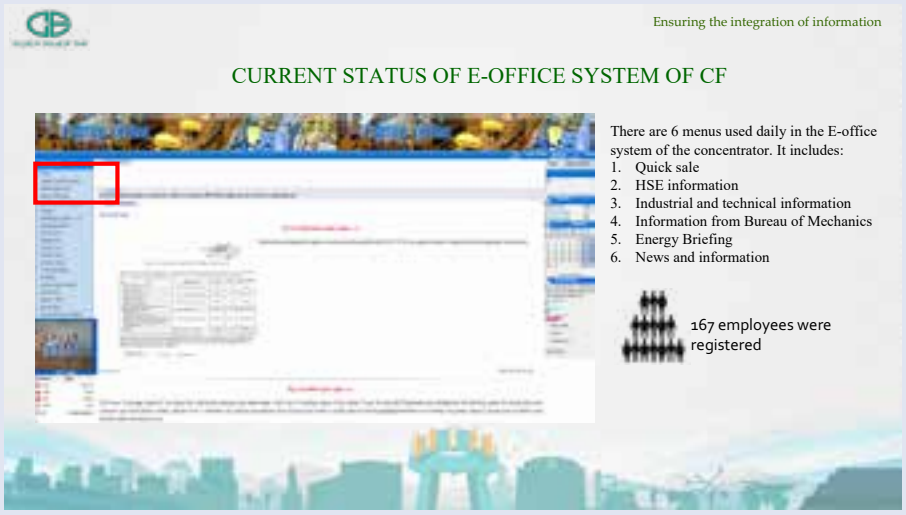
58.3% Difficult to use and the system is outdated

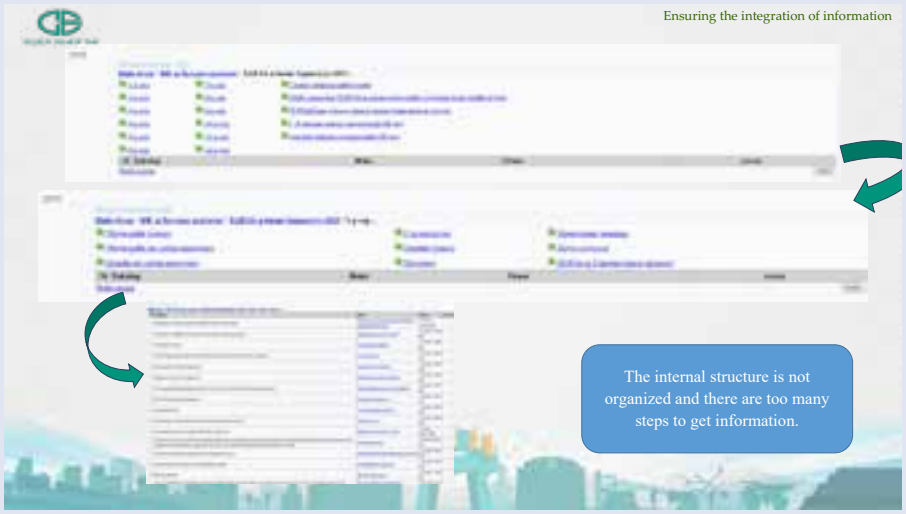
11.1% Not available to all employees

27.8% Cannot be used from a mobile phone

2.8% Don't know, no suggestion


SURVEY RESULTS ON INTEGRATION OF E-OFFICE AND PRODUCTION DEPARTMENT'S DIGITAL.ERDENETMC.MN SYSTEM /engineers/
Needs to integrate
81.8%
Need to integrate
18.2%
A total of 47 engineers participated in the survey. Engineers use those systems regularly in their day-to-day operations. All of them have access.
DIFFICULTIES ENCOUNTERED IN USING E-OFFICE
27.8%
Difficult to use and the system is outdated
11%
Improve design and appearance
11.2%
Information dimension, availability lacks
5.6%
Cannot be used from a mobile phone
44.4%
Don't know, no suggestion


Ensuring the integration of information
CURRENT STATUS OF E-OFFICE SYSTEM OF CF
There are 6 menus used daily in the E-office system of the concentrator. It includes:
1. Quick sale
2. HSE information
3. Industrial and technical information
4. Information from Bureau of Mechanics
5. Energy Briefing
6. News and information
167 employees were registered


Ensuring the integration of information
The internal structure is not organized and there are too many steps to get information.

Ensuring the integration of information

Project implementation progress information

In the framework of the project, the e-office system of the Concentrator and the current state of the plant's digital.erdenetmc.mn system were determined and compared. In conclusion, it was decided that it would be easier and time-saving for employees to get information from one source and access it from personal devices by combining the two systems.

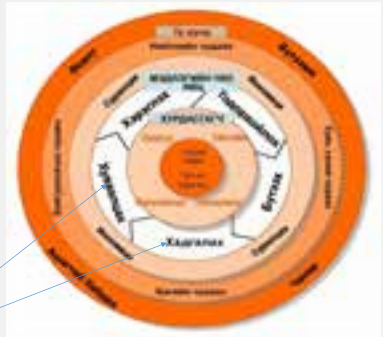
A software engineer is not available for this enhancement due to planned or incremental work. Also, there was a response that 1 person is insufficient to develop the system.

Ensuring the integration of information

We used the following knowledge management tools in this project

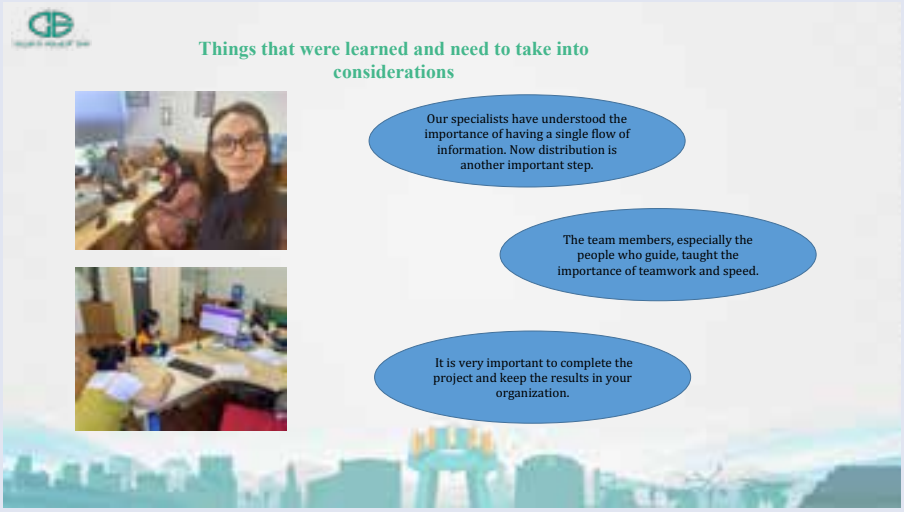
- Collaborative Physical Workspaces
- Communities of practice
- Knowledge base
- Learn from cases
- Collect new ideas and knowledge
- Video meeting and webinar
- Social network services
- After action review
- Documented information management and documentation

- We meet every Tuesday in the CF training hall to discuss the progress of the project.
- The project team involved users and developers.
- The project process compared the internal information network that has been in operation since 2005 in CF and the digital information network currently in use at EMC.
- Research has been done in reality.
- Researched ways to find new solutions and developed proposals.
- Digitization was used for team activities.
- Virtual forms of public information transmission of EMC
- .....
- The team members identified the aspects they learned from the project and the mistakes they made
- Documented information management and documentation

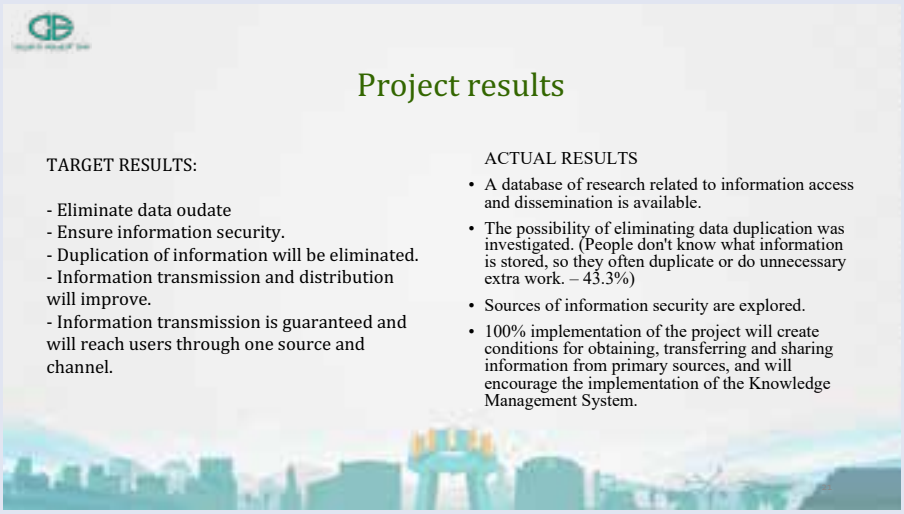


The implementation of the project is aimed at ensuring the stages of KNOWLEDGE KEEPING AND SHARING of the Knowledge Management System.

As a result of the project, there will be an opportunity to create, share, store, and use knowledge, and ensure the fulfillment of duties.


Things that were learned and need to take into considerations
Our specialists have understood the importance of having a single flow of information. Now distribution is another important step.
The team members, especially the people who guide, taught the importance of teamwork and speed.
It is very important to complete the project and keep the results in your organization.


Things that were learned and need to take into considerations
It took a lot of time due to the structure and hierarchy of "Erdenet Mining Corporation".
As the project team members have different careers, it was interesting to see how the same issue was discussed from the perspectives of many professionals.
As we continued to work on the project, we saw the need to develop teamwork and creativity.
I realized that it is very important to confirm the progress of the project.
There was a lot to learn from the team members.
Equal participation of team members in teamwork felt very important.


Project results
TARGET RESULTS:
- Eliminate data oudate
- Ensure information security.
- Duplication of information will be eliminated.
- Information transmission and distribution will improve.
- Information transmission is guaranteed and will reach users through one source and channel.
ACTUAL RESULTS
• A database of research related to information access and dissemination is available.
• The possibility of eliminating data duplication was investigated. (People don't know what information is stored, so they often duplicate or do unnecessary extra work. – 43.3%)
• Sources of information security are explored.
• 100% implementation of the project will create conditions for obtaining, transferring and sharing information from primary sources, and will encourage the implementation of the Knowledge Management System.

Source: EMC [8].

FIGURE 16

EMC'S MINING SITE AND EMPLOYEES' EVENT

Source: EMC [8].

Thermal Power Plant No. 3 (TPP3)

Company Overview

The Ulaanbaatar TPP3 is a coal-fired operating power station with a capacity of at least 50 megawatts (MW). TPP3 was established in 1968. It is the dominant type of electricity generation in Mongolia and also supplies heat during winter. Operating in the power plant industry for more than 50 years has its own set of challenges, especially when it comes to retaining institutional knowledge from the senior batch of employees. Further, innovation plays an important role in improving productivity, requiring constant initiatives and a readiness for employees and management to continue learning and innovating. Innovation can be in the form of processes, products, or business models.

Background

In Mongolia, thermal power plants are essential for meeting the country's electricity demand, particularly during extreme weather conditions when heating and energy consumption are high.

The reasons for TPP3 to embark on this project involve acknowledging the multifaceted benefits it offers across various aspects of plant operations. Firstly, the preservation of expertise and institutional knowledge is crucial, especially with the retirement of experienced workers. Capturing this knowledge

ensures a smooth transfer to newer employees, preventing loss, and aiding in operational continuity. Documenting historical data further enhances operational insights and optimization.

Operational efficiency and safety are significantly boosted through KM projects. Access to well-documented knowledge enhances decision-making processes and reduces errors by providing clear guidelines and learnings from past experiences. Maintenance and reliability are also improved as preventive maintenance and troubleshooting become more efficient through detailed records and resolutions.

Moreover, compliance and risk management are crucial aspects where KM plays a vital role. Well-documented knowledge related to regulatory compliance aids in meeting legal obligations and mitigating risks by learning from past incidents. Additionally, training and development benefit from structured KM systems, enhancing new employee onboarding, and fostering a culture of continuous learning.

Furthermore, innovation and continuous improvement thrive with effective knowledge management systems. Encouraging innovative solutions and best practices adoption fosters a culture of improvement and ensures benchmarking against industry standards. In conclusion, implementing a robust KM system not only preserves valuable information but also significantly boosts operational efficiency, safety, and innovation, ensuring continued productivity and compliance with modern standards for TPP3.

Project Implementation and Achievements

Knowledge portals, such as the Able Moments App introduced by TPP3, can significantly increase the productivity of power plants by facilitating efficient access to critical information, fostering collaboration among employees, and supporting continuous learning and improvement. Knowledge portals contribute to enhancing productivity by serving as centralized repositories of relevant information, including operating procedures, technical manuals, equipment specifications, maintenance schedules, safety guidelines, and best practices. By providing easy access to this information, power plant personnel can quickly find answers to questions and troubleshoot issues, reducing downtime, and improving operational efficiency.

Furthermore, knowledge portals enable power plants to establish and standardize operational practices across different shifts, teams, and locations. By documenting and sharing standardized procedures and protocols, knowledge portals ensure consistency in operations, leading to improved reliability and performance. Knowledge portals facilitate collaboration among different departments and disciplines within the power plant. Employees can share insights, lessons learned, and innovative ideas through discussion forums, wikis, and collaborative spaces. This collective knowledge sharing fosters a culture of continuous improvement and problem-solving.

At the same time, TPP3 has also improved the implementation procedure of training and onboarding. Knowledge portals support these processes by offering training materials, e-learning modules, and instructional videos. New employees can quickly get up to speed on plant operations and safety protocols while existing employees can access refresher courses and advanced training to enhance their skills.

Training and onboarding play a crucial role in KM within power plants. They are essential components that contribute to effective knowledge transfer, skill development, and operational readiness. Training and onboarding programs facilitate the transfer of critical knowledge and expertise from experienced employees to new hires or less experienced personnel. In this regard, TPP3 has introduced the mentor-mentee program that includes knowledge about plant operations, safety procedures, maintenance practices, troubleshooting techniques, and regulatory requirements. By systematically transferring knowledge through training, power plants ensure that essential information is passed on to the next generation of workers.

Onboarding programs organized by TPP3's Human Resource Department prepare new employees for their roles within the power plant, ensuring they have a solid understanding of their responsibilities, job expectations, and the overall operational environment. Well-planned onboarding processes accelerate the integration of new employees into the organization and minimize the time required for them to become productive contributors.

Safety and compliance training is crucial in the energy industry. Training programs emphasize safety protocols and regulatory compliance standards specific to power plant operations. By educating employees on safety practices and procedures, power plants reduce the risk of accidents and ensure compliance with industry regulations. Properly trained employees are better equipped to identify and mitigate safety hazards in the workplace.

Key Takeaways

Establishing effective knowledge sharing requires a combination of strategies, tools, and cultural practices. The lessons learned at TPP3 may guide readers to establish an effective knowledge sharing environment:

i) **Cultural emphasis:** Foster a culture that values knowledge sharing and collaboration. Encourage openness, transparency, and a willingness to learn from others. Recognize and reward individuals and teams that actively contribute to knowledge sharing efforts.

ii) **Leadership support:** Gain buy-in and support from top leadership. Leaders should demonstrate their commitment to knowledge sharing through their actions, communication, and resource allocation. Leadership endorsement helps set the tone and priorities for knowledge sharing initiatives.

iii) **Clear objectives:** Define clear objectives and goals for knowledge sharing efforts. Determine what knowledge needs to be shared, who needs to be involved, and what outcomes are expected to be achieved. Align these objectives with the organization's overall strategic priorities.

iv) **Technology infrastructure:** Invest in technology infrastructure to support knowledge sharing activities. Implement a KM system, collaboration tools, and communication platforms that facilitate seamless sharing, storage, and retrieval of information.

v) **Training and education:** Provide training and education to employees on the importance of knowledge sharing as well as on how to effectively share and access knowledge. Offer workshops, webinars, and tutorials on using KM tools and best practices.

vi) **Content management:** Develop processes and guidelines for managing and organizing knowledge content. Establish standards for documentation, categorization, tagging, and version control to ensure consistency and accessibility. Regularly review and update content to keep it relevant and up-to-date.

vii) **Community building:** Create communities of practice or interest groups around specific topics or areas of expertise. These communities provide a platform for like-minded individuals to share ideas, collaborate on projects, and exchange knowledge and experiences.

viii) **Recognition and incentives:** Recognize and reward individuals and teams that contribute valuable knowledge and insights. Provide incentives, such as bonuses, awards, or professional development opportunities to encourage active participation in knowledge sharing activities.

ix) **Feedback mechanisms:** Establish feedback mechanisms to gather input from users and continuously improve knowledge sharing processes. Solicit feedback through surveys, focus groups, and suggestion boxes. Act on feedback to address any issues or areas for improvement.

x) **Lead by example:** Encourage leaders and senior employees to lead by example and actively participate in knowledge sharing activities. Share their own experiences, expertise, and lessons learned to inspire others to do the same.

xi) **Continuous evaluation and improvement:** Regularly evaluate the effectiveness of knowledge sharing initiatives against predefined metrics and KPIs. Identify areas for improvement and make adjustments as needed to optimize the impact and value of knowledge sharing efforts.

By following these strategies, an effective knowledge sharing environment that promotes collaboration and innovation in TPP3 can be established.

Power plants are complex systems with various interconnected components (e.g., turbines, generators, boilers, control systems). KM ensures that critical knowledge about these components, maintenance procedures, and operational best practices is captured, organized, and accessible. Efficiently managing this knowledge streamlines daily operations, reduces downtime, and enhances overall plant performance.

Additionally, KM in TPP3 helps improve safety and compliance. Power plants operate under strict safety regulations and environmental standards.

KM helps plant managers and operators stay informed about safety protocols, emergency procedures, and compliance requirements. Therefore, TPP3 has improved access to up-to-date safety guidelines to ensure a safe working environment and minimize risks.

KM fosters innovation by encouraging collaboration among engineers, technicians, and operators. Sharing expertise and lessons learned enables the adoption of new technologies, process improvements, and energy-saving practices. Hence, TPP3 able to improve innovation and continuous learning.

Efficient Training and Succession Planning

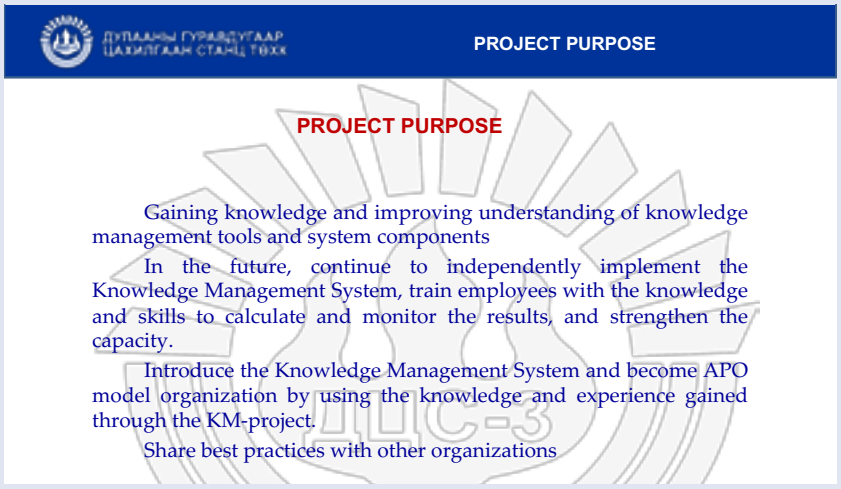
KM facilitates training programs for new employees and ensures a smooth transition during personnel changes.

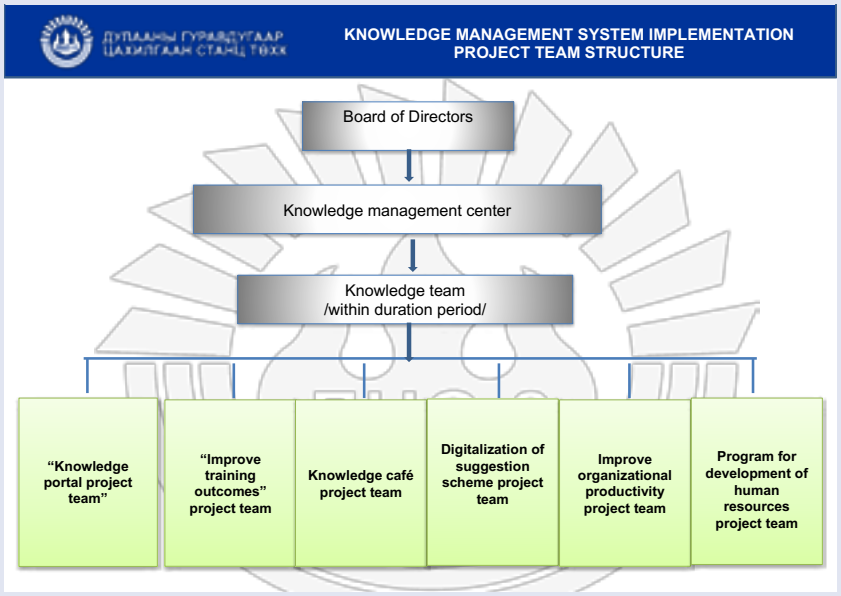
Documented procedures, training materials, and knowledge repositories effectively help onboard staff. Retaining institutional knowledge prevents disruptions and maintains operational continuity.

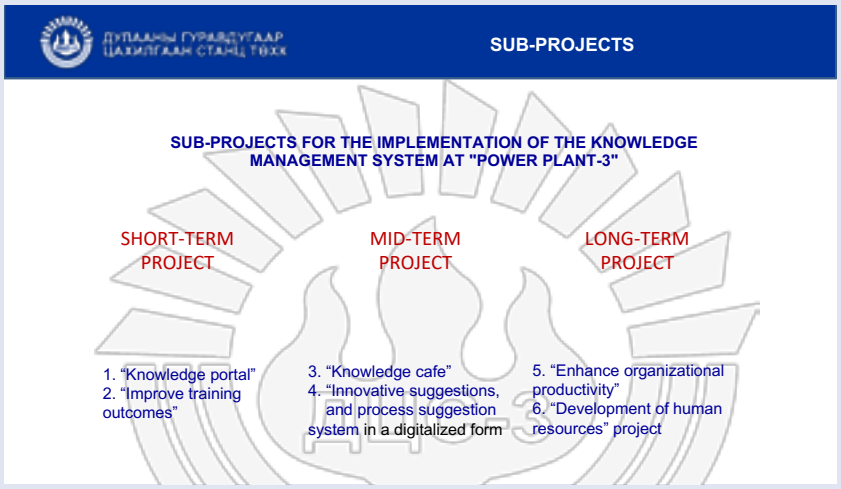
In summary, knowledge management in TPP3 enhances efficiency, safety, decision-making, innovation, and workforce development. It ensures critical knowledge is shared, preserved, and leveraged for sustainable energy production.

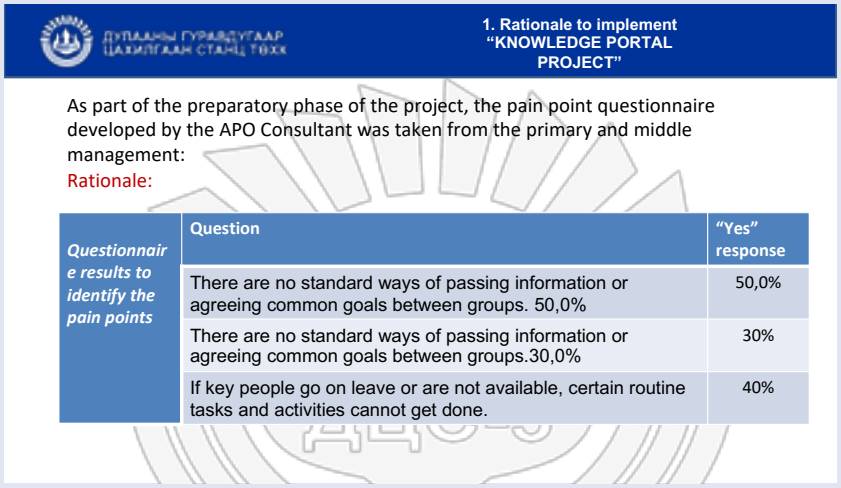
FIGURE 17

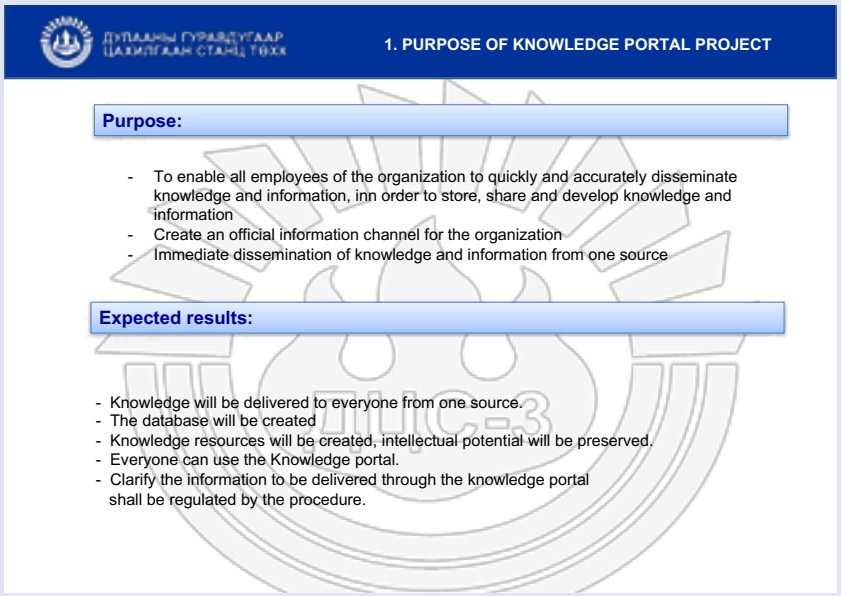
PROJECT SUMMARY OF TPP3






SUB-PROJECTS
SUB-PROJECTS FOR THE IMPLEMENTATION OF THE KNOWLEDGE MANAGEMENT SYSTEM AT "POWER PLANT-3"
SHORT-TERM PROJECT
MID-TERM PROJECT
LONG-TERM PROJECT
1. "Knowledge portal"
2. "Improve training outcomes"
3. "Knowledge cafe"
4. "Innovative suggestions, and process suggestion system in a digitalized form
5. "Enhance organizational productivity"
6. "Development of human resources" project

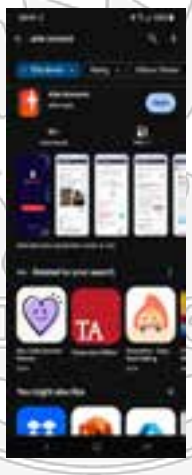

1. Rationale to implement "KNOWLEDGE PORTAL PROJECT"
As part of the preparatory phase of the project, the pain point questionnaire developed by the APO Consultant was taken from the primary and middle management:
Rationale:
Questionnaire results to identify the pain points
Question
"Yes" response
There are no standard ways of passing information or agreeing common goals between groups. 50,0%
50,0%
There are no standard ways of passing information or agreeing common goals between groups.30,0%
30%
If key people go on leave or are not available, certain routine tasks and activities cannot get done.
40%


1. PURPOSE OF KNOWLEDGE PORTAL PROJECT
Purpose:
- To enable all employees of the organization to quickly and accurately disseminate knowledge and information, inn order to store, share and develop knowledge and information
- Create an official information channel for the organization
- Immediate dissemination of knowledge and information from one source
Expected results:
- Knowledge will be delivered to everyone from one source.
- The database will be created
- Knowledge resources will be created, intellectual potential will be preserved.
- Everyone can use the Knowledge portal.
- Clarify the information to be delivered through the knowledge portal shall be regulated by the procedure.

1. IMPLEMENTATION OF KNOWLEDGE PORTAL PROJECT

"Able moments" app

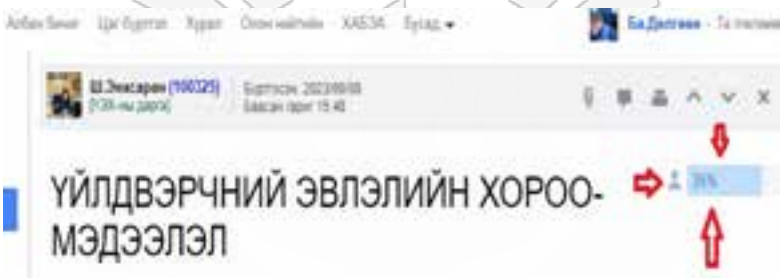
- The project team had several meetings after researching and calculating, and determined the official channel for the organization's information transmission.
- A video tutorial on how to install Able Moment App from Able Soft was distributed
- According to the study, the use of the Able app was 18-20%



"Able Moments" mobile app

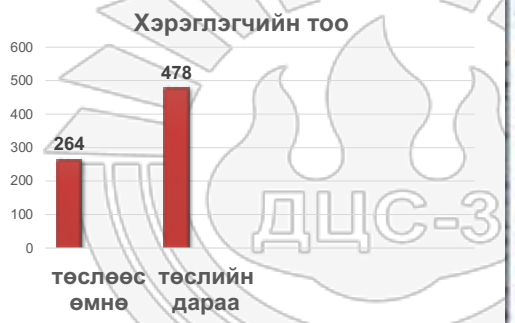
PROJECT RESULTS

"Able Moments" mobile app was reached to 35% of total number of employees



PROJECT RESULTS

- TOTAL REGISTERED– out of 998 employees
- “ABLE MOMENTS” – 478 employees are using it



3. Knowledge café project

Project 3: “Knowledge cafe”
Rationale: Questionnaire to Identify Pain points - Disagreements and misunderstandings between employees/departments are common. 46.7%

Purpose: To create a friendly environment that respects each other by learning about the misunderstandings or unknown informations between offices, departments, workshops, and units through this project.

Expected results: Expected results: Improved coordination of units and departments.
-.

3. IMPLEMENTATION OF THE OPEN DOOR PROJECT

A "Knowledge Cafe" room was created and decorated in the repair section

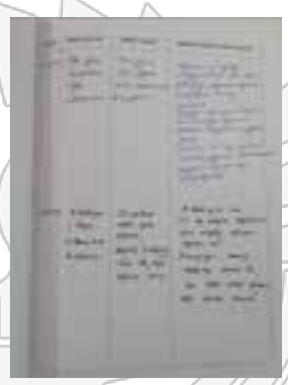
ДУЛААНЫ ГУРАВДУГААР ЦАХИЛГААН СТАНЦ ТӨХК

3. IMPLEMENTATION OF THE OPEN DOOR PROJECT

A comfortable environment was created for employees to informally sit down over coffee and discuss their issues.

ДУЛААНЫ ГУРАВДУГААР ЦАХИЛГААН СТАНЦ ТӨХК

3. IMPLEMENTATION OF THE KNOWLEDGE CAFÉ PROJECT



In the knowledge room, note-taking boards and log books were prepared and placed on the issues discussed during the meeting.

ДУЛААНЫ ГУРАВДУГААР ЦАХИЛГААН СТАНЦ ТӨХК

4. The basis of the project to digitalize the operation of the innovation and suggestion scheme

Rationale:

	Question	"Yes" response
Questionnaire results to identify the pain points	People are discouraged from contributing and sit back because ideas for improvement are forgotten or not implemented.	46,7%
	Even when there is room for improvement, people only use old methods in the organization get things done.	76,7%
	Learning, improvement, quality and innovation are often used as catchphrases, not the actual work of changing or improving the way things are done.	46,7%

Expected results:

- Provide opportunities for employees to receive information about innovation, creativity and ideas of the organization in a transparent and open manner
- Company-wide initiatives, quality circles, and innovation projects database will be created.

The implementation of digitalizing the suggestion system project

Results: Able has begun additional contracted development work to digitalize and add additional functionality to the Suggestion System.

Operation of suggestion system in the first 10 months:

- **Кайзен саналын тоотолцоо**

996 САЙН САНАЛ
996 САЙН АЖИЛ
996 ЭЕРЭГ УР ДҮН

565 САНАЛ

Хэрэгжсэн санал 228

The implementation of digitalizing the suggestion scheme project

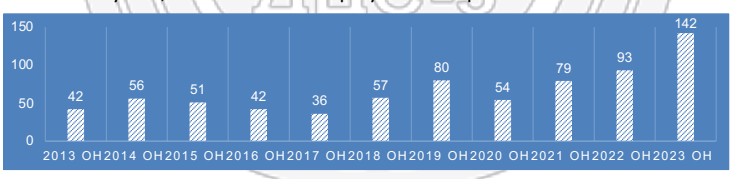
Result: Able-community added a new module "good suggestions" to the session. We have been testing the suggestions and making improvements on a case-by-case basis. By making the suggestion system electronic, the employee who submitted the suggestion will be able to see where, to whom, and at what stage suggestion is going. A good proposal team's process of receiving, sorting, discussing, and transferring reports can be done easily and quickly.

"5. Basis of the "Human Resource Development Package Program" project

- In May 2023, the pain point questionnaire developed by the Consultant was distributed from the primary and middle management:

	Question	"Yes" response
Questionnaire results to identify the pain points	When people with important knowledge and experience leave, knowledge leave with them.	43,3%
	A lot of experienced people are approaching retirement age, or there is a tendency to take away experienced people from our organization.	63,3%
	There are people who have important knowledge, but they are not appreciated.	40%

- In recent years, the number of employees who quit has increased dramatically:



"5. Basis of the "Human Resource Development Package Program" project

- "Objectives of the Human Resource Development Package Program: It is to quickly adapt the new employees of the company to work, to improve the performance of the mentor -mentee contract, to introduce the creativity of engineers and the culture of learning from one another, and to strengthen the bond between the young generation and the elders who have succeeded.
- This package consists of 3 parts:

1. New Employee Orientation Program
2. Veteran Mentor or Succession Program
3. Engineers Street Program

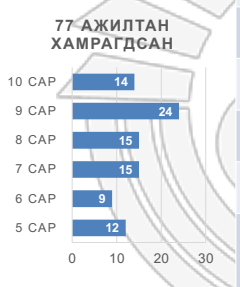
"5. Implementation of "Human Resource Development Package Program" project

In May 2023
The new employee orientation program was changed to an adjustment program.
In June 2023
The training on the topic of organizational pride and being a member of the community has been newly developed.
In August 2023
The contents of the teacher-student contract for new employees were amended and approved. After this program, a new evaluation sheet was created and used in evaluation.
In September 2023
As a result of the evaluation of the program, a work plan for further improvement was issued.

In June 2023
Mentors were selected from staff nearing retirement age. A mentee is selected for mentoring by mentors.
In August 2023
Changes were made during implementation. 2 out of 5 mentors and mentees were changed. An additional guide was appointed
In September 2023
Through the mentorship program, experience of "Erdenet Corporation" and the State General Prosecutor's Office were studied and an evaluation form was developed.
In October 2023
The performance of the employee contracts was reviewed and praised.

In May 2023
Engineers were selected to participate in the Coaching program.
In June 2023
The participants of the Program were trained in "About coaching and How to coach". /Dale Carnegie Learning Center Online Study Guide/
In September 2023
Monitored the progress of the work and advices were provided.
In October 2023
The report was received and the performance of the contract was evaluated and appraisal was carried out.

Adaptation of new employee program



Step	New employee orientation program	New employee adjustment program
1	New employee orientation training	Make an introduction to new workplace
2	OHS training	New employee orientation training
3	Make a mentor mentee contract	OHS training
4	Traineeship	Make a mentor mentee contract
5	Take an exam to become a full-time employee	Attend 2 moduled training
6		Use 70/20 method for traineeship
7		7 days before the end of the traineeship, mentor will meet the mentee and give the test form
8		Take an exam to become a full-time employee

“MENTOR MENTEE PROGRAM”




Mentor: Altanzaya U.
Automatic relay protection installer
Work experience: 35
Mentee: Dagvasuren M.
Automatic relay protection installer
Work experience: 26
Coordinator: Altanshagai B.
Relay protection automation engineer
Expected results: 4 new skills will be learnt

Mentor: Altangerel E.
Steam section welder
Work experience: 33
Mentee: Purevee. S.
Mechanic of repairing steam units and heat pipes
Work experience: 20/1
Coordinator: Boldsaikhan Kh.
Welding engineer
Expected results: 4 new skills will be learnt

Mentor: Dalaibileg D.
Excavator driver
Work experience: 26
Mentee: Bayarjargal N.
Excavator driver
Experience:4
Coordinator: Jargalsaikhan D.
Shift supervisor foreman
Expected results: 3 new skills will be learnt

Mentor: Bat-Ulzii B.
Turbine operator
Work experience: 32
Mentee: Erdenbaatar B.
Turbine operator
Work experience: 3
Coordinator: Bat-Erdene U.
Shift supervisor foreman
Expected results: 4 new skills will be learnt

“COACHING PROGRAM”




COACH: GANZORIG D.
Wagon oveturner master

STUDENT: MUNKHZORIG L.
Heavy mechanism department’s Mechanic engineer

COACH: MUNKHBAYAR U.
Mechanics department’s Turning gear repair master

STUDENT: TUGEEBAATAR
Design repairation repair master

COACH: NARANCHIMEG N.
Non destructive testing engineer

STUDENT: BOLDSAIKHAN KH.
Welding engineer

COACH: BAYARAA J.
Senior engineer

STUDENT: BATTUVSHIN B.
Shift engineer

CONCLUSION

First of all, we would like to express our deep gratitude to Ida Yasin, a consultant of APO and the directors and experts of MPO, who provided valuable advice, training and support in the implementation of the knowledge management project.

Implementation of the knowledge management project has given the following results to our organization. It includes:

- The company's knowledge and information channel has been defined to quickly deliver it to all employees from one source.
- "Organizational Knowledge Base" has been created to share the knowledge of senior employees and experienced engineers and technicians of the company.
- Employees of departments and units have knowledge workplaces where they can organize informal meetings and discuss their work and problems, without necessarily having a formal meeting.
- Learned how to create, define and share organizational knowledge.
- In the future, the knowledge management policy and objectives of the company will be determined and continuously improved as an integral part of the operation.
- Also, it will be pleasant to share the acquired knowledge and experience with other organizations and to learn from others.

FIGURE 18

A SESSION OF KNOWLEDGE SHARING IN TPP3

Source: TPP3 [9].

Challenges of KM Implementation

Challenges of KM Implementation from the Perspective of Management Team

The perception that KM is not important to a management team in an energy or mining company can stem from several misconceptions or challenges within the organization. Here are some possible reasons why a management team might undervalue KM:

i) **Short-term focus:** Management teams' focus primarily on short-term goals or immediate challenges may overlook the long-term benefits of KM. They may prioritize tangible outcomes, like cost reduction or production efficiency, over intangible benefits associated with knowledge sharing and organizational learning.

ii) **Lack of awareness or understanding:** Some management teams may not fully understand the concept and potential impact of KM. They might perceive it as an abstract or theoretical concept, rather than a practical tool for improving decision-making, innovation, and operational performance.

iii) **Misalignment with strategic objectives:** If KM initiatives are not aligned with the company's strategic objectives or business priorities, management teams may perceive them as peripheral or unnecessary. It is important for KM efforts to demonstrate clear alignment with organizational goals and value propositions.

iv) **Focus on traditional metrics:** Management teams often prioritize metrics related to financial performance, production targets, and operational efficiency. If KM outcomes are not measured or linked to these traditional metrics, they may be undervalued or deprioritized.

v) **Perceived complexity or cost:** Implementing effective KM requires investment in technology, training, and cultural change. Some management teams may view this as a complex and costly endeavor without clear visibility into the potential returns on investment.

vi) **Cultural barriers:** Organizational cultures that discourage knowledge sharing or collaboration can hinder the adoption of KM practices. If employees perceive knowledge as a source of

individual power or competitive advantage, they may resist efforts to formalize knowledge sharing processes.

vii) **Overreliance on individual expertise:** In industries like energy, where technical expertise is highly valued, management teams may overrely on the knowledge and experience of key individuals. This can create vulnerabilities if critical knowledge is not shared or documented effectively.

viii) **Lack of tangible results:** If previous KM initiatives failed to deliver tangible results or if the benefits were not clearly communicated, management teams may develop skepticism or reluctance toward future efforts.

Addressing these challenges requires proactive efforts to educate and engage management teams on the strategic importance of KM. Demonstrating concrete benefits, such as improved decision-making, enhanced innovation, and risk mitigation can help shift perceptions and secure leadership support for KM initiatives. Additionally, fostering a culture of knowledge sharing and aligning KM with core business objectives are essential for overcoming barriers and ensuring sustained organizational success.

APPENDIX

Consideration of Issues

In creating the KM project goals, some typical issues to consider are:

- Asset value: How will value be measured? For example, what is the value proposition that KM will bring to the organization? In the case of TPP3 and CUMC, it is to ensure efficient electricity generation and transmission service to the citizens of Mongolia. What is the risk of not performing?
- Benefit potential: What results can be achieved? For example, a bigger market share for EMC? What are the potential returns? For instance, more sales or profit for EMC, contributing to Mongolia's national income
- Cost effectiveness: What will it cost in time and money? What will be the cost saving to the organization in terms of time or effort? For example, replacement cost. Another way of looking at a knowledge asset is the cost to the organization if it had to be redone from scratch. If a disaster occurred (e.g., a technical team leaving or computer records destroyed by fire), what will it cost today to recover everything? Or, liability cost? How vulnerable would a company be to legal liability if the KM process were not in place? For example, repeat failures due to lack of knowledge; power cuts that stop manufacturing production, among others

Project Video

Following the KM implementation projects, the Mongolian Productivity Organization (MPO) had arranged for a video to be made for the KM projects. They are uploaded on YouTube, and the links are as follows:

- KM video project: https://www.youtube.com/watch?v=Z9Tu38kjMkk
- Link to the Dissemination conference live stream: https://www.youtube.com watch?v=EykRL3H0Q2Q

Knowledge Management Publications by the APO

Reflecting on the KM programs organized by the APO, the International Productivity Conference (IPC) was held in Bangkok, Thailand, in 2008. This conference adopted the theme "Knowledge Management – From Brain to Business", that showcased outstanding KM applications by globally renowned enterprises from Asia, Europe, and the United States of America.

Professor Ikujiro Nonaka was the keynote speaker of the conference. His presentation titled "Strategy as Distributed Phronesis: Knowledge Creation for the Common Good", emphasised the importance of KM as an essential tool to drive strategy for organizations. He highlighted that for a company to create value, it must possess the ability to determine and undertake the best actions in any specific situation to serve the common good.

In 2008, the APO published a book titled "KM in Asia: Experience and Lessons" with the aim of designing a more systematic and focused KM program. A survey was initiated on the status of KM in nine member economies and compiled about two dozen case studies of exemplary KM practices in the private sector, government, and NGOs in Asia.

The survey of good KM practices described in the book validated earlier concepts and yielded useful new insights that can help the APO improve its program to assist National Productivity Organizations (NPOs) in KM and to help member economies to move toward knowledge-based development (KBD).

Many leading organizations in KM practice in Asia are shifting their focus from excellence in operational productivity and quality management to excellence in strategic innovation and learning through KM. Thus the APO continues to encourage the replication or adaptation of best practices in quality improvement. But more importantly, it will increase efforts to stimulate the innovation of "next practices" to enhance the global competitiveness of Asian enterprises.

The "APO Knowledge Management Facilitators' Guide (KMFG)" was first published in September 2009. Ten years later, several major developments in KM have taken place globally as well as changes in the APO's view of productivity and related issues necessitated updates in the APO KM Framework.

The APO KMFG latest edition that was published in 2020 [4] aims to provide trainers and consultants in NPOs and elsewhere with a better understanding of KM so that they can guide others in its implementation. The guide includes ready-to-use presentation slides for KM facilitators which can be customized to meet specific needs. It contains easy-to-follow training instructions under the APO KM Framework, including detailed notes on the key messages of each slide, trainers' notes, and smooth slide transitions in the series, complete with suggestions on timing. It is hoped that this edition of the guide will spread the KM message across the Asia-Pacific and beyond.

The "APO Knowledge Management Tools and Techniques Manual" is the second publication and updated in 2020 [10]. It describes some key KM methods, tools, technologies, and techniques for selection within the KM implementation initiative, especially in small and medium enterprises (SMEs).

A key objective for the APO has been to develop a comprehensive training manual on KM Tools and Techniques to provide in-depth knowledge, assisting NPO trainers to make the leap and become KM educators and consultants. The manual accompanies the "APO Knowledge Management Facilitators' Guide", the "Practical Knowledge Management Guide for SME Owners/Managers [11], the "Knowledge Management: Case Studies for Small and Medium Enterprises" [12], and "Knowledge Productivity in the Public Sector" [13], and "Knowledge Management in Asia: Experience and Lessons" [14]. These publications are available at www.apo-tokyo.org.

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