MS242:

Specification of the EURAD p-KMS (prototype)

Work Package 11 State-of-Knowledge

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Disclaimer

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Executive Summary

Milestone (MS) 242 is an outcome of Task 1 of the EURAD WP 11 (State-of-Knowledge) which has been devoted to the screening and review of existing Knowledge Management (KM) approaches and KM tools currently used in radioactive waste management (RWM) organizations [2]. These approaches and tools were evaluated in respect to their possible benefit for the EURAD KM requirements, see deliverable D11.9 [4] for details. Based on the outcome of this assessment/analysis this MS242 is using the results of the above mentioned screening and review exercise to come up with a detailed plan for the set-up of a EURAD portal-KM system (p-KMS).

Hence, the aim of this document is to describe the implementation steps for the development of a EURAD p-KMS. This includes a list of recommended documents, listed in [ANNEX A], which contains required supportive actions that are expected to be delivered from associated EURAD information technology (IT) experts and that should be generated during the implementation phase to ensure transparency of the process to set up the p-KMS for the EURAD community.

The objective of MS242 is to assist the PMO in the decision making process by selecting the best and most feasible way for a EURAD p-KMS development.

Taking into account that the portal development is closely associated with IT, it has been recommended to establish a EURAD IT expert's group. The tasks of this group are defined as follows: monitoring, evaluation and assessment, estimation to expand the capabilities of the portal in future, content management. This group should be the first contact point for portal developers and for all monitoring, assessment and approval issues. One important aspect of this IT expert's group will be to discuss and decide on who (which users) should get access to the EURAD knowledge inventory and at which level. Also it must be decided at an early stage of the development process of who will deliver the p-KMS product and where such a repository will be hosted (external or remote server).

It is also suggested that the processes required for the portal development have to be monitored by the EURAD IT expert's group and that these processes have to be discussed within WP 11 State of Knowledge. For the latter several meetings are planned [ANNEX B].

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Glossary

The following are common terms to be used globally in the context of the EURAD Roadmap. They are specifically adapted for and directly linked to EURAD Knowledge Management and might thus deviate from definitions used in other communities. Please consider this list not as final and comprehensive. It will be extended if new expressions emerge during the progress of EURAD.

Communities of Practice (CoP)

A voluntary group of peer practitioners who share lessons learnt methods, and best practices in a given discipline or for specialized work. The term also refers to a network of people who work on similar processes or in similar disciplines, and who come together to develop and share their knowledge in that field for the benefit of both, themselves and their and other organization(s).

Concept maps

Tools for organizing and representing knowledge.

Content

The interactive and non-interactive object containing information represented by text, image, video, sound or other media.

Content management

The processes and workflows involved in organizing, categorizing and structuring information resources so that they can be stored, published and reused in multiple ways.

Critical knowledge

Knowledge established in the context of a particular position that is deemed imperative for incumbents of said position to possess before being allowed to perform associated duties and tasks independently.

Document management

Systems and processes for managing documents including the creation, editing, production, storage, indexing and disposal of documents. This often refers to electronic documents and uses specific document management software.

Domain

An area of activity, interest, or knowledge, especially one that a particular person, organization etc. deals with RWM. It represents the lowest level (Level 3) of the EURAD Roadmap Goals Breakdown Structure.

Domain Insight (DI) Documents

Context documents that provide direct links for each knowledge domain to safety and implementation goals related to DGR requirements.

EURAD

The European Joint Programme on Radioactive Waste Management (EURAD). Also referred to as the ‘Joint Programme’.

Expert

Someone widely recognized as a reliable source of knowledge, technique or skill whose faculty for judging or deciding rightly, justly, or wisely is accorded authority and status by their peers or the public in a specific well-distinguished domain.

Features

The functional or non-functional distinguishing characteristic of a system.

Goal Breakdown Structure (GBS)

The EURAD goal breakdown structure is a functional-oriented breakdown of knowledge essential for implementing radioactive waste management, leading to geological disposal. Currently the updated Strategic Research Agenda of the established EURAD programme comprises a hierarchy of Themes (Level 1), Sub-themes (Level 2) and Domains (Level 3) containing Domain Insight, SoK and SoTA documents.

Information management

The management of an organization's information resources with the aim of improving the performance of the organization. Information management underpins knowledge management, as knowledge is derived from information.

Knowledge

Knowledge is the acquisition, understanding and interpretation of information. It is often used to refer to bodies of facts and principles accumulated by humankind over the course of time. Knowledge and information each consists of true statements, but knowledge serves a purpose: knowledge confers a capacity for effective action.

Knowledge base

A collection of knowledge in the form of subject-problem-solution information that pertains to a specific topic or subject of interest. A knowledge base is a special kind of database for knowledge management.

Knowledge champions

People in different business units, divisions and functions, who support the central KM team in implementing various KM initiatives.

Knowledge Management (KM)

An integrated, systematic approach of identifying, managing and sharing an organization's knowledge and enabling groups of people to create new knowledge collectively to help in achieving the organization's objectives.

Knowledge Management System (KMS)

Knowledge Management System is a system for applying and using knowledge management principles to typically enable to create, share and find relevant information & knowledge quickly.

Knowledge portal

A comprehensive access structure to resources that are suitable to support the fundamental activities of knowledge management in a given knowledge domain to communicate, study and do research.

Knowledge preservation

A process of maintaining an organizational system of knowledge and capabilities that preserves and stores perceptions, actions and experiences over time and secures the possibility of recall for the future.

Metadata

Descriptors which define and describe the data and the circumstances of their creation (date, persons, locations, institutions, treaties, liabilities, storages, access modes etc.).

Ontology

An ontology is a formal description of knowledge as a set of concepts within a domain and the relationships that hold between them, which enable users to link multiple concepts to other concepts in a variety of ways.

Portal

A portal is a tool to integrate many existing systems within an organization as well as to provide a solid platform to develop other knowledge management initiatives, enhancing the efficiency of communication and of organizational processes. A portal greatly facilitates the production, accessibility, sharing and effective use of valuable information. It also guarantees generation and usage of information at different times or across different locations and teams.

Portal-Knowledge Management System (p-KMS)

Portal-KMS is a comprehensive access structure to resources that are suitable to support the fundamental activities of knowledge management of to communicate, study and do research.

Radioactive Waste Management (RWM)

All activities, administrative and operational, that are involved in the handling, pre-treatment, treatment, conditioning, transport, storage and disposal of radioactive waste.

Roadmap

A generic RWM framework to organise different typical scientific and technical domains and sub-domains in a logical manner against different phases of a RWM programme.

Records management

Processes relating to the generation, receipt, processing, storage, retrieval, distribution, usage and retirement of an organization's records.

State-of-Knowledge (SoK)

Experts' view of the most relevant knowledge and associated uncertainties in a specific domain/sub-domain applied in the context of a radioactive waste management programme. Activities consisting of developing a systematic approach of establishing the state-of-knowledge in the field of RWM research.

State-of-the-Art (SotA)

Reports about most recent scientific facts underpinning specific areas of the knowledge base.

Strategic Research Agenda (SRA)

Describes the scientific and technical domains (and sub-domains) and knowledge management needs of common interest between EURAD participant organisations.

Taxonomy

A hierarchical structure in which a body of information or knowledge is categorized, allowing an understanding of how that body of knowledge can be broken down into parts, and how its various parts relate to each other. Taxonomies are used to organize information in systems, thereby helping users to find it.

Text mining

Text mining, also known as text data mining, is the process of transforming unstructured text into a structured format to identify meaningful patterns and new insights.

Themes

Themes are large groupings of related Knowledge Domains typical in RWM. They are the highest level of the EURAD Roadmap work breakdown structure.

Vocabulary

Vocabulary is designed to support consistent indexing and end user navigation, browsing and searching. It gathers synonyms, acronyms, variant spellings, relation etc.

Work Package (WP)

A work package is a group of related tasks established within EURAD. Because they look like projects themselves, they are often thought of as sub-projects within the Joint Programme.

1. Introduction

The State-of-Knowledge WP of the EURAD joint program on RWM strongly contributes to EURAD KM "Preservation and capitalisation" [14]. There, EURAD as a joint programming provides:

1. a platform for interaction to find out what is most useful to investigate and what should be done in KM for RWM
2. resources to develop the identified KM issues
3. a pool of experts that make knowledge available
4. means to create networks for (face-to-face) interaction as part of KM
5. a network of representatives of Member States of different stages of national program developments and concomitant different needs and offers in KM
6. a community of different categories of actors representing national responsibilities in radioactive waste management, safety oversight and research

All aspects of the Knowledge Management Program [1] of EURAD listed above will be made available on the p-KMS. The outcomes of a screening and review of existing and currently available KM approaches and/or tools, recently discussed within the KM breakout session of the EURAD 2nd Annual Event [5], the follow-up KM session and EURADWASTE '22 conference [6], have clearly shown the end users demand for unlimited and easy access to a sustainable KMS. The p-KMS will improve the performance of the organizations and individuals of the EURAD Community by providing them with knowledge and information, best practices and lesson learnt in the area of RWM and promises high added value to EURAD KM. The communication tool of the portal will create an additional channel for constant collaboration with the experts in this area. This EURAD p-KMS will reduce the risks of knowledge and information loss in the area of RWM and will ensure sustainable development of KM there for many decades. Thus, this Milestone MS242 "Specification of the EURAD KM platform (p-KM)" becomes a part of a series of reports describing different phases of the development of the EURAD Knowledge Management and Networking Programme 2020-2024, including Deliverable 11.10 [2], 11.1 [2] and 11.9 [4], which set the context for the construction of a EURAD p-KMS. The purpose of this document MS242 is to structure all phases and stages of the p-KMS development. MS242 describes a detailed plan for its development based on selected features, which are given in deliverable 11.9 [4]. This deliverable is directly related to the EURAD KM SoK "task 1 - Knowledge Platform: Specification" with the following document:

> Deliverable 11.9: "Specification of the EURAD KM platform (p-KMS)" as an initial proposal addressing basic SoK Platform functionalities.

In addition, a meeting of the PMO, WP11 and WP12 working groups devoted to "Portal-KMS development" was held on 27.06.2022 [APPENDIX A] in which various ideas on the implementation stages of the p-KMS development were discussed. During this meeting it became clear that there are two pathways to be considered for a p-KMS development within EURAD. One option considers involvement of EURAD internal resources, whereas the second option considers involvement of commercial products. The participants of the above mentioned meeting have discussed in detail their

possible involvement and provided recommendations, which should be addressed and considered by the PMO [APPENDIX A]

The communication and storage capabilities of the web-based systems make computational power an important assistant of effective KM. Thus, the portal has the potential to become a very popular and crucial instrument in KM by providing users with a single point access to the various knowledge repositories from different locations. The p-KMS will allow to gather, manage, share, and utilize information that has been generated within the various EURAD WPs and in addition by previous work both from EURATOM activities and from national and other international actions. The ultimate goal is to make this knowledge available for end users. The EURAD p-KMS will define a single point of immediate remote access to the invaluable set of EURAD documents and knowledge bases from disparate (Projectplace, WiKi, EURAD website etc.) information sources. The core task (main function) of the p-KMS is providing support in knowledge retrieval and its preservation for future needs.

It is well known that knowledge management portals have three main purposes. They act as an integrational[1] tool, as an access tool for the knowledge base and/or other information resources, and as a communication tool [7]. In this regard the EURAD p-KMS will provide users with unconstrained access to the EURAD KM documents (SotA, SoK, DIs, etc.) and will enhance collaboration between EURAD knowledge champions and WPs with end users via their active engagement within the EURAD KM Community of Practices (CoP).

There were detailed discussions with the surveyed RWM Organizations about the deliverable D11.1 [2] during the workshop on 30th November 2021 and subsequently later with many EURAD Community members during the EURAD Annual Event follow-up meeting on 29th June 2022. They contributed to a better understanding of the different kinds of services the knowledge portal should provide. Examples of various available p-KMS are listed in D11.9.

[1] Integration is the act of bringing together smaller components into a single system that functions as one. In an IT context, integration refers to the end result of a process that aims to stitch together different, often disparate, subsystems so that the data contained in each becomes part of a larger, more comprehensive system that, ideally, quickly and easily shares data when needed. https://www.techtarget.com/searchcustomerexperience/definition/integration

2. Portal lifecycle management

The development and management of a portal encompasses a whole portal lifecycle. This lifecycle contains four phases [8],

- ✓ Architecture
- ✓ Development
- ✓ Staging
- ✓ Production

which are divided into two parts (implementation and maintenance) and altogether are composed of the following 8 stages. Each of them are addressed in detail in separate sections below. These stages are:

- preparation,
- planning,
- frontend (user interface) development,
- content writing,
- coding,
- backend development,
- testing, refinement, launching,
- maintenance and updating [8].

During the preparation stage of the first phase, i.e. the architecture phase, the specific planning, including the design of a graphical user interface (GUI) can start. Security issues will already be taken into account at this stage. The features and functions are difficult to separate from each other because of their interrelations. Therefore, in the development stage (coding) the recommended core features of D11.9 will be analyzed and respective decisions for the set-up of the p-KMS will be made [4]. Here also the content filling is placed. The phase staging covers testing and configuration of the portal. The final stage of the portal development is the roll-out that covers any later modification and reconfiguration (maintenance and updating) of the content by administration. At this phase the portal will be presented to the users.

It is strongly recommended to call a meeting of an ***IT Expert's group***[2] of the EURAD Community to stimulate a detailed discussion on how to monitor and control the progress of the portal development process [APPENDIX A] and also to organize the follow up actions. Since these selected IT experts already provide professional services within EURAD Member States organizations, they are familiar with organizational needs and external technological developments. Taking into account that the EURAD Community currently consists of 104 organizations [14] it is advised that the advanced RWM organizations (Andra, Posiva, SKB) or other large research institutions such as JRC should be contacted

[2] The IT Expert's Group is a group of experts and programmers specialized in information technology. The tasks for this group are defined as follow: monitoring, evaluation & assessment, estimation to expand the capabilities of the portal in future, content management.

first. Usually, these organizations have well established document management systems and enterprise information systems for many years. Hence, their experience will be highly appreciated and will help to define the technical parameters and will deliver advice on the planning stage. In any case, the IT Expert's group will play a vital role in the early detection of malfunctions or missing operational features, allowing to fix them during the portal development.

The essential and optional features and their associated major functions were identified and categorized in Deliverable 11.9 [4] and support the core functions of the p-KMS. The core functionalities were defined as follows: customization and personalization[3], advanced search, collaboration and community, extensibility, security and content management.

The practical development of the EURAD p-KMS can be done in two ways:

1. With internal resources of the EURAD Community [APPENDIX A]
    a. By one (for example Andra, JRC) selected organization of the EURAD Community, or
    b. By creating a group of IT Expert's that will set up a production team from different organizations (all belonging to the EURAD Community),
2. With external resources [APPENDIX C]
    a. By purchasing a commercially available product, (as an example: iFinder by IntraFind Software AG),
    b. By purchasing a commercially available product, with additional coding to expand the capabilities, or
    c. By purchasing the service of a company which would set up and develop such a portal for the needs of the EURAD Community

Both ways require, that PMO in cooperation with WP 11 SSTC NRS will provide guidance for the "Call for Tender", e.g. define requirements, declare concrete tasks and expectations for the portal developers and approve and define a respective budget. Beside the above mentioned general set of requirements, an evaluation and assessment protocol has to be designed at this stage, too. Assessment is a part of the evaluation process, which is the action of comparing a process or process output measurements against given criteria to determine the performance of the process or conformity of a process output. It is the declaration that a service or product complies with the given customer characteristics or requirements.

This protocol shall summarize and rank advantages and disadvantages of each option, taking into account not only financial issues but also timeliness, expertise, and support sustainability. The aim of the protocol is to support PMO in the decision making process [ANNEX A]. The deadlines for each intermediate steps, e.g. for the evaluation and assessment protocols, have to be set and confirmed with WP11 and the PMO. Appendix A and B can serve as an orientation.

[3] Customization and personalization is the action of creating or modifying an item using customer data to meet an individual's needs. Customization is when the customer manually makes changes to the item to meet their needs or requirements. [Acquire]

Meetings [ANNEX B] are planned to accompany this implementation process, as suggested in Appendices A and B. A first meeting has to be called for defining the implementation process and decide and confirm the subsequent actions plan. The following seven meetings will escort each step of the portal development. The last meeting has to be launched for developing a strategy for portal acceptance and to decide when, where and how to carry out the p-KMS announcement.

The various implementation stages of the p-KMS development were given in the above shown paragraph and are identical for both described ways [APPENDIX B or APPENDIX C]:

2.1 Preparation

This is a first stage of the architecture phase. At this stage the determination of all necessary requirements, e.g. domain (URL), storage capacity, of the portal are selected and confirmed by the EURAD IT Expert's group. This stage is already rather advanced due to the two documents (D11.1 and D11.9), which are specified below:

- ✓ The expectations from the p-KMS and recommendations on some functionalities were obtained via survey and questionnaire, D11.1 [2]
- ✓ Specification of the EURAD KM platform (p-KMS), namely the essential and additional functionalities, are outlined in D11.9 [4]

2.2 Planning

This is a second stage of the architecture phase and the following actions have to be planned:

- ✓ Confirmation of the selected features and technical parameters of the p-KMS that will guide the portal development. Participants: IT expert's group and WP11.
- ✓ The set of measures to be defined by participants: IT expert's group and WP11.

2.3 Frontend (user interface) development

The portal GUI will be shaped at the third stage of the architecture phase. The main function of the layout is the presentation of the information structure, the visualisation of the content (audio and video elements) and the comprehensible presentation of the basic functions as well as easy handling for the users. Layouts contain labelling of buttons, toolbars, workflows with feedback messages for the users, both in cases of success and failure, help function, user preferences and themes, customizations etc. and can outline a visual impression and general understanding of the future user interaction with the p-KMS. The frontend[4] will have to extract from replies from the system operational information and error information. The operation information is a current status of the service or whether the requested operation was successful. That basically covers the part where the system behaves as expected. Error

[4] Frontend refers to the user interface. https://it-service.network/it-lexikon/frontend#:~:text=Als%20Frontend%20wird%20die%20so,das%20Backend%20n%C3%A4her%20am%20System.

information can either be that the service was not accessible or that the service received an exception and failed to complete the request [15]. The list of the features has been given in D11.9 [3].

After the evaluation of the frontend and the correction of respective errors/dysfunctionalities, WP 11 should review the layout specifications and send their feedback (taking into consideration [9-11]) back to the IT expert's group.

2.4 Content writing

The content writing will be done at this step of the frontend development stage. Here, the text content, input areas (dialog boxes) will be created.

2.5 Coding

At this coding stage of the development phase, the portal will be programmed and a home (introduction) page with the GUI defined earlier will be created. The coding involves tasks such as analysis, generating algorithms, profiling algorithms' accuracy and resource consumption, and the implementation of algorithms in a chosen programming language. Tasks accompanying and related to coding include debugging[5], source code maintenance, implementation of build systems, etc. The upcoming action will be the set-up of the portal structure.

2.6 Backend development

This is the next stage in the staging phase of the portal development. The backend means the database, server and delivering information. The respective content of the p-KMS will be separated into primary purpose information (EURAD documents) and secondary purpose information (general information, links to other organizations, conferences and trainings). Thus, the content of the portal can be changed by authorized users. The authorization of rights has to be granted according to the previously worked out and defined authorization policy, which will be developed. The authorization policy has to be subsequently reviewed by WP11 and approved by PMO.

This stage also involves presentation to and validation by the EURAD Community. For this reason, at this stage the WP11 defines established standards for information collection, processing and presentation of selected information on the p-KMS [ANNEX A].

Attention: This content should not be mixed with the one discussed in chapter 2.4. Here the focus is on the RWM-related, scientific, engineering and regulatory content – the Knowledge Base - manifested in documents addressing Themes, DIs, SoTAs, and others. Detailed information about these EURAD documents can be found in the EURAD Roadmap guide [12] and the document/report «Capturing the State-of-Knowledge in EURAD Knowledge Management» [13]. The Knowledge Base of the portal is

[5]Debugging is the process of finding and resolving bugs (defects or problems that prevent correct operation) within computer programs, software, or systems. [Wikipedia]

already in preparation and temporarily placed on EURAD KM WIKI. Based on recommendations of the IT expert's group the knowledge base (KB) will be kept separately on a cloud or a stationary/local server and will be connected to the portal. This will be discussed during the kick-off meeting of the IT expert's group, with WP 11 and with the PMO.

2.7 Testing, Refinement & Launching

The launching of the portal on a selected host system, the testing of all service functionalities, measures and fixation of the defined uncertainties have to be done on this final stage of the staging phase. It is itself divided into several levels. A representative set of documents will be required at each level for testing purposes. The testing levels can be characterized as follows:

1. During coding, the programmers will already run regular internal tests to check the functionality and interactions of all code pieces.
2. After the prototype is ready, the IT expert's group will test it and compare the functionalities to the ones defined in the call for tender.
3. Then, a group of representative users (testing group[6]), to be selected by the IT expert's group, will test functionality with the focus on user interaction and system responses.
4. Eventually there will be a review of the implementation process and a test phase for the portal running. Here WP 11 will be actively involved.

An iterative refinement of the intermediate system states will be done before the subsequent test level. The metrics and measures have to be collected and analyzed at all test levels. The purpose is to achieve an optimal balance of functionality, performance and positive user experience. The evaluation method and acceptance criteria for approval of the portal has to be prepared by WP 11 SSTC and approved by the IT expert's Group [ANNEX A].

2.8 Maintenance & updating

Sustainable management of the portal has to be provided to ensure constant updating of information, continuous improvement of knowledge and documents as well as continuous filling of the KMS and the corresponding validation of the documents. Moreover, the user feedback with respect to p-KMS functionalities/interaction also has to be collected and utilized to improve the p-KMS itself, not only its Knowledge Base. The roles and responsibilities for validating the content of the portal, checking its usability and conducting performance testing, have to be clearly settled beforehand. For this reason, the

[6] Testing group here means a group of people (not involved into the portal development) interested to test a portal from end user perspectives and share their feedback for further improvement.

appointment of separate knowledge and content managers[7] for a p-KMS is strongly recommended. The following tasks will be addressed during this stage of the production phase:

- ✓ Design of a strategy for portal content publication, including updating.
- ✓ Guidance on the portal usage via written manuals and tutorial videos (WP11 & WP13).
- ✓ Feedback collection and quality assessment of the portal functionality (WP11) [**Erreur ! Source du renvoi introuvable.**].
- ✓ Promotion of the portal has to be provided continuously (PMO, WP11, KM Ambassadors).

[7] The tasks of the knowledge manager are to validate, update and revise the documents and information. The tasks of the content manager are to keep a secondary purpose information [see the paragraph **Erreur ! Source du renvoi introuvable.**] up to date, to check the external links, notification system and to monitor functionality of the portal.

3. Conclusions

The Milestone MS242 “Specification of the EURAD KM platform (p-KM)” has composed detailed instructions of the portal development. In this document the portal development phases and stages, their descriptions and consequences of the follow up actions have been incorporated into an implementation plan of a portal development, covering the whole lifecycle, see previous chapter. It is based on core features and functions of the portal as already given in Deliverable 11.9. The portal could either be developed by internal or external resources, for both ways (*cf.* APPENDIX B and APPENDIX C), however further differentiations are possible. An associated “Evaluation and Assessment protocol” shall illustrate advantages and disadvantages of each option, providing the PMO with additional support for decision making with respect to the p-KMS implementation way.

The development of the portal will require a list of documents for regulating the tasks as outlined in ANNEX A. As the development of the knowledge portal requires expertise and skills, WP11 and WP12 strongly suggest nominating an IT expert’s group composed of members of the EURAD Community. Various tasks of this group have been described in chapter “Portal lifecycle management”. This group can also advocate for the selection of the portal development implementation way and provide professional advice to the PMO, which will definitely assist the PMO in making decisions.

Independently on the chosen ways, the development of the portal should be done following the eight stages described in this document. The milestones for both options of the respective development processes are given in the Appendices. The monitoring of the development processes will be provided by a nominated EURAD IT expert’s group in cooperation with WP11.

The standards listed in the References have to be taken into account, too.

4. References

1. Knowledge Management & Networking Programme 2020-2024, “Supporting the capturing of knowledge and its transfer between organizations and Member States and generations” https://www.ejp-eurad.eu/publications/eurad-knowledge-management-and-networking-programme.
2. SSTC NRS (2022): Deliverable 11.10, Feedback mechanism for Domain Insights, SoK documents and KM Systems –Methods and results. (to be submitted)
3. Abbasova D., Arnold, T., Brendler, V., Franzen, C. (2021): Screening and review of existing/available knowledge management approaches and/or tools. Final version as of 08.03.2021 of deliverable D11.1 of the HORIZON 2020 project EURAD. EC Grant agreement no: 847593. https://www.ejp-eurad.eu/publications/eurad-deliverable-111-screening-and-review-existingavailable-knowledge-management.
4. Abbasova D., Arnold, T., Brendler, V., Franzen, C. (2022): Specification of the EURAD KM platform (p-KMS). Deliverable D11.9 of the HORIZON 2020 project EURAD. EC Grant agreement no: 847593. (under review)
5. Summary EURAD second annual event, https://www.ejp-eurad.eu/publications/summary-eurad-second-annual-event.
6. https://www.sfen.org/evenement/fisa-2022-euradwaste-22/
7. “Development of knowledge portals for nuclear power plants.” Vienna: International Atomic Energy Agency, 2009, ISSN 1995-7807, NG-T-6.2.
8. BeaWebLogic Portal, Portal development guide, ver.10.2, 2008.
9. ISO/IEC/IEEE 23026:2015(en) Systems and software’s engineering-Engineering and management of websites for systems, software, and service information.
10. ISO/IEC 270027:2013 Information technology – Security techniques-Code of practice for information security control.
11. SSTC NRS (2022): Feedback mechanism for Domain Insights, SoK documents and KM Systems –Methods and results. Final version as of .09.2022 of deliverable D11.10 of the HORIZON 2020 project EURAD. EC Grant agreement no: 847593.
12. EURAD Roadmap - A generic framework to organise typical scientific and technical domains/ sub-domains in a logical manner against different phases of a RWM programme. https://www.ejp-eurad.eu/roadmap.
13. Knuuti T., Tatomir, A., Göbel, A., Franzen, C., Abbasova, D., Arnold, T., Brendler, V., Fuzik, K. (EURADWASTE22) (2022): Capturing the State-of-Knowledge in EURAD Knowledge Management. EPJ Nuclear Sciences & Technologies 8:37. https://doi.org/10.1051/epjn/2022030
14. Theodon L., Introduction to the EUROPEAN JOINT Programme on Radioactive Waste Management – EURAD, 14.09.2020 https://www.ejp-eurad.eu/publications/louise-theodon-introduction-eurad.
15. George Younan, “Backend for an End User Portal - Creating a flexible and dynamic portal and investigating how to provide richer interaction with the home”. Master thesis, TRITA-ICT-EX-2009:194

APPENDIX A: Summary of the first virtual meeting on "Implementation stages of the portal-KMS development"

Date: June 27, 2022

Host: HZDR

Participants:

Paul Carbol (PMO)

Alexandru Tatomir (WP11, leader)

Tobias Knuuti (WP11)

Dinara Abbasova (WP11)

Thuro Arnold (WP11)

Vinzenz Brendler (WP11)

Kateryna Fuzik (WP11)

Jiri Faltejsek (WP 12)

Jitka Miksova (WP12)

Discussion:

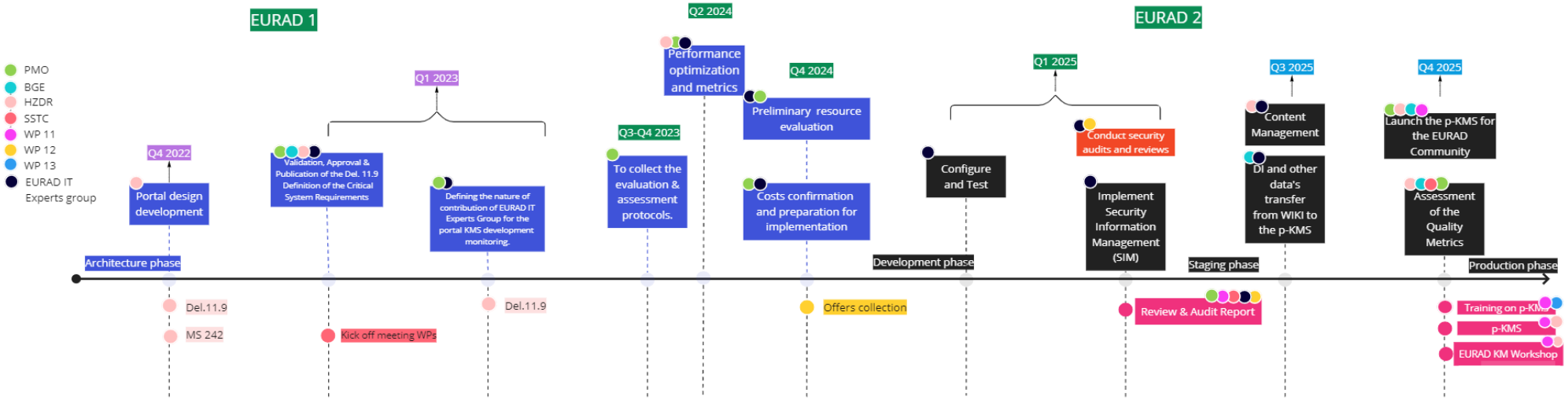
The potential role of the participants and WPs have been discussed. It became clear that for a professional monitoring and supervision of the p-KMS development an involvement of EURAD IT Experts will be needed. Thus, such a EURAD IT Experts Group should be created. The IT Experts from mandated actor organizations of the EURAD Community must be invited for participation in the development of the p-KMS. The monitoring, assessment, negotiation with portal developers and feedback is planned to be done by this IT Experts' group.

The QA/QC procedures will be implemented in cooperation with the IT Expert's group as marked in the APPENDIXES A and B implementation stages.

Call for action:

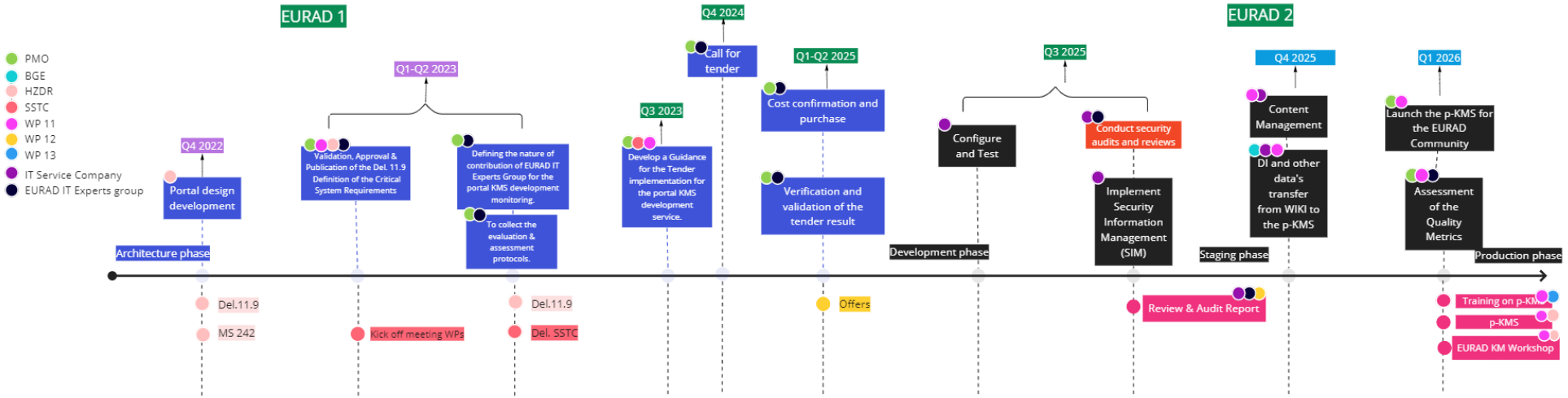
The participants of the meeting recommend the PMO to approach the EURAD Community to identify and nominate suitable candidates for such an IT Expert's group.

APPENDIX B: Milestones of the p-KMS development by EURAD IT Experts group



The diagram shows the implementation stages of the portal development carried out by EURAD IT expert's group. The colored circles on the left indicate the involvement of the listed groups or organizations at different stages of the p-KMS development process. The diagram is divided into 2 sub-areas. The processes and participations are shown in the upper part and the supporting documents and actions are listed on the lower side of the diagram.

APPENDIX C: Milestones of the p-KMS development by IT Company (commercial product)



The diagram shows the implementation stages of the portal development carried out by an IT company. The colored circles on the left indicate the involvement of the listed groups or organizations at different stages of the p-KMS development process. The diagram is divided into 2 sub-areas. On the upper part the processes and involvement are displayed and the supportive documents and actions are listed on the lower side of the diagram.

ANNEX A: List of the documents required for regulation for p-KMS development processes

- ✓ To create the “EURAD IT Expert’s Group”, define tasks and a scheduled activity plan for monitoring the progress of the p-KMS development.
- ✓ Guidance for the “Call for Tender”, e.g. to define requirements, declare concrete tasks and expectations for IT companies.
- ✓ Evaluation and assessment protocol of the suggested two ways of the p-KMS development
- ✓ Tender Evaluation Protocol with the evaluation processes and result on the EURAD website.
- ✓ Evaluation method and acceptance criteria for approval of the portal.
- ✓ Portal policy, to be published on the p-KMS, and additionally distributed within EURAD Community by WP11.
- ✓ Collection of feedback on the portal functionality.
- ✓ Documentation of the quality assessment of the portal functionality (modify the chapter in D11.10 - SSTC).
- ✓ Established standards for information collection, processing and presentation of selected information on the p-KMS.

ANNEX B List of tentative meetings promoting the p-KMS development

- ✓ 1st meeting: WP SoK & PMO
- ✓ 2nd meeting “Preparation”: EURAD IT Experts group & WP SoK & PMO
- ✓ 3rd meeting “Planning”: EURAD IT Experts group & IT Company
- ✓ 4th meeting “GUI Design”: EURAD IT Experts group & IT Company
- ✓ 5th meeting “Content Filling”: EURAD IT Experts group & IT Company & WP 11
- ✓ 6th meeting “Testing, Refinement & Launching”: EURAD IT Experts group & IT Company & WP SoK & PMO
- ✓ 7th meeting “Maintenance & Updating”: EURAD IT Experts group & IT Company & WP SoK
- ✓ 8th meeting “Announcement”: EURAD IT Experts group & WP SoK & PMO & EURAD WPs