The concept of Belarusian portal of practical nuclear knowledge
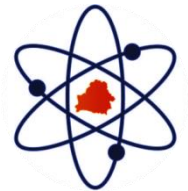
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Workshop
Minsk
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What is nuclear knowledge management?

Atomic, Molecular and Condensed Matter Physics 10%
Nuclear Physics 11%
Life Sciences 18%
Safeguards 0,4%
Isotopes 1%
Non-Nuclear Energy 1%
Nuclear Materials 9%
Economic, Legal & Social 2%
Environmental & Earth Sciences 3%
Engineering & Instrumentation 9%
Fusion Research and Technology 7%
Elementary Particle Physics 16%
Nuclear Fuel Cycle & Radioactive Waste 3%
Nuclear Power & Safety 6%
Chemistry 4%

Subject area of nuclear knowledge

Nuclear knowledge (NK) base stems from both research and development and the industrial application of nuclear technologies, and includes both energy and nonenergy applications.

Knowledge management (KM) to be an integrated, systematic approach to identifying, acquiring, transforming, developing, disseminating, using, sharing, and preserving knowledge, relevant to achieving specified objectives.

IAEA actively develops methodologies and guidance documents for planning, designing and implementing *nuclear knowledge management (NKM)* programs and facilitates nuclear education, providing support, networking opportunities and experience exchange.

Development of NKM by IAEA

https://www.iaea.org/topics/nuclear-knowledge-management
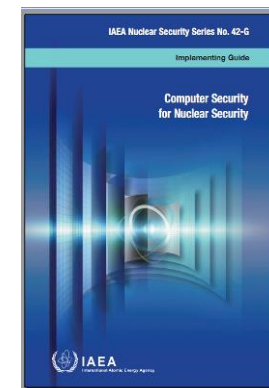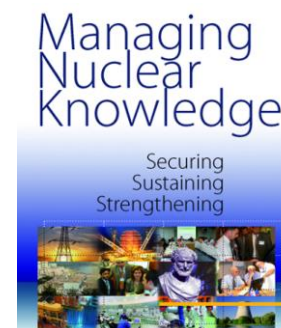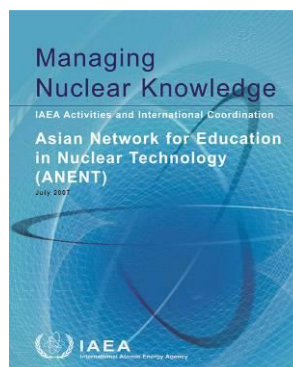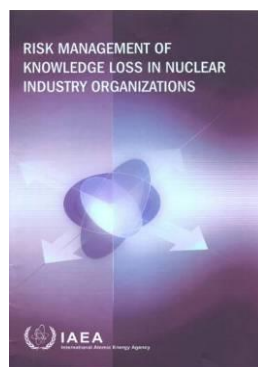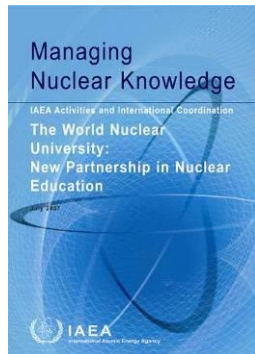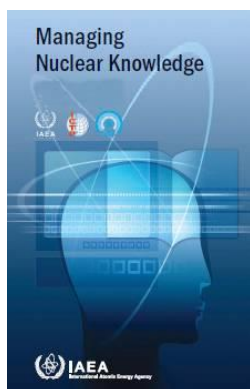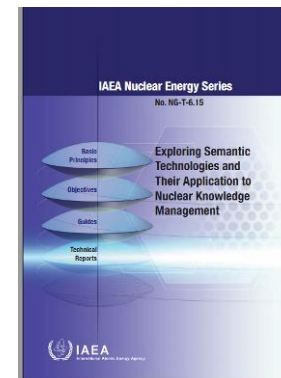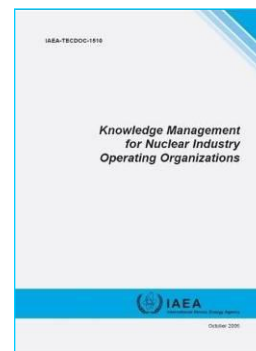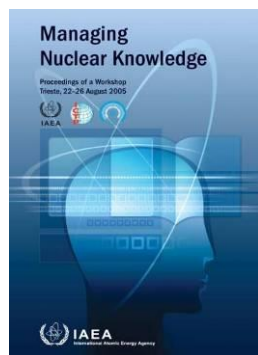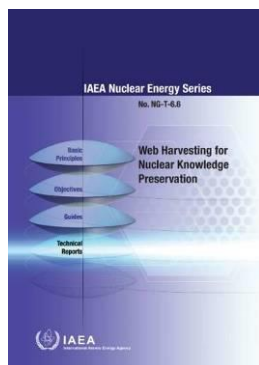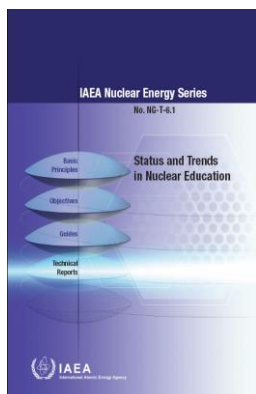
NKM system in Belarus

Objective of the project :
Create an efficiently functioning nuclear knowledge management system in the Republic of Belarus, taking into account national specifics, and develop information technologies for intellectual support of the information and analytical activities of Gosatomnadzor, create and maintain a national electronic nuclear knowledge portal of the Republic of Belarus under the aegis of Gosatomnadzor.

Stages of the project:
1. Development of regulatory, methodological and administrative documents regulating KM activities, formation of a policy in the field of NKM.
2. Creation of the necessary infrastructure (hardware, software).
3. International cooperation in the field of NKM (seminars, meetings, joint projects).
4. Training specialists for functioning of NKM system.
5. Inventory, systematization and description of critical NK.
6. Development of procedures and organization of knowledge exchange.
7. Creation of new knowledge; placement of all acquired knowledge in DB; monitoring of the activities of NKM system.

Concept of Portal of Practical Nuclear Knowledge

Portal

1. Presents scientific achievements and the accumulated post-Chernobyl experience of Belarus.
2. Be an information platform both for newcomer countries and for old residents of the nuclear club.
3. Is based on the IAEA NKM principles.
4. Uses modern information technologies, including semantic technologies and free software.
5. Is based on further development of belarusian software products –
   - Intellectual Information System of a Gosatomnadzor employee to ensure control (supervision) in the field of nuclear and radiation safety,
   - Electronic portal of nuclear knowledge of educational institutions
     of the Republic of Belarus BelNET https://belnet.bsu.by/.
6. Contains many materials in the public domain.
7. Involves to cooperation people from belarusian organizations, research institutes and universities.
8. Develops the best world and Belarusian practices in NKM.
9. Provides automation of processing of electronic appeals on administrative procedures.
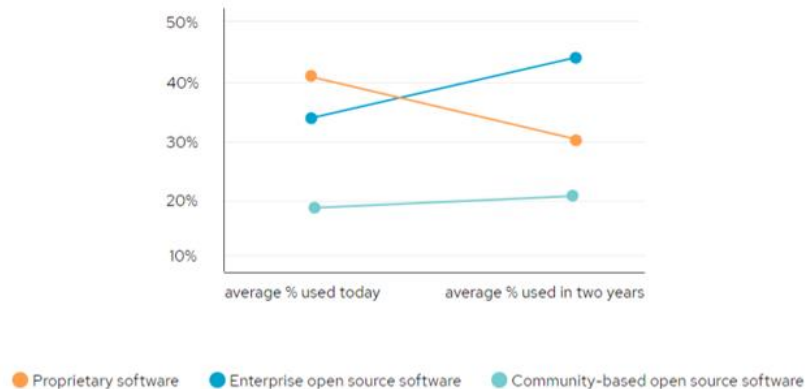
Free software

Free software (open source software, also libre software) is a software, the users of which have the rights ("freedom") to install, run, freely use, study, distribute and change (improve), and distribute copies and results of the change. If software has exclusive rights, then freedoms are declared through free licenses.

Proprietary software (_non-free software_) is a software that is the proprietary property of its authors or copyright holders and does not meet the criteria for free software.

Growth of open source software will come at the expense of proprietary software

- Proprietary software
- Enterprise open source software
- Community-based open source software

average % used today   average % used in two years

Using Free software

Advantages:

✓ Cheapness and anti-corruption.

✓ Safety. Many proprietary applications from well-known manufacturers contain undocumented features, which is a potential threat. Access to the source code of the program makes it possible to control this aspect.

✓ Adaptability. The large number of free applications available makes it easy to tailor them to the specific needs of users.

Our system (framework *eLab*) has a client-server architecture, running undo Windows and Linux operating systems, based on free software:

➢ Debian GNU / Linux,

➢ Apache web-server,

➢ Firebird database server,

➢ PHP application server.

It works through the Web interface in multi-user mode with shared access rights through any browsers.

Implementation of the concept – Intellectual Information system
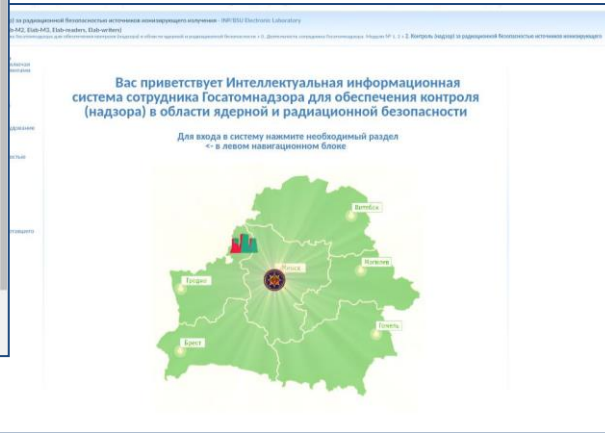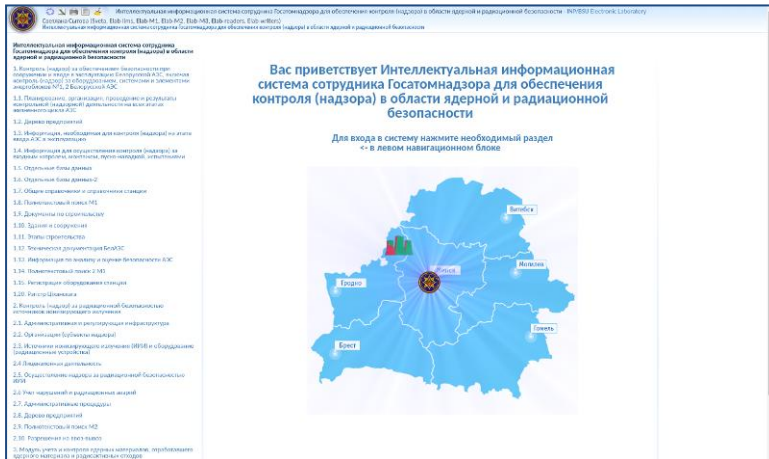
It is designed to automate the work of Gosatomnadzor employees in terms of control (supervision) of ensuring safety during the construction and commissioning of the Belarusian NPP, including control (supervision) of equipment, systems and elements of power units No. 1, 2 of the Belarusian NPP and control (supervision) of radiation safety sources of ionizing radiation, licensing of activities in the field of the use of atomic energy and IRS, licensing activities, accounting of IRS and nuclear materials for all MBAs of the country with reporting to the IAEA.
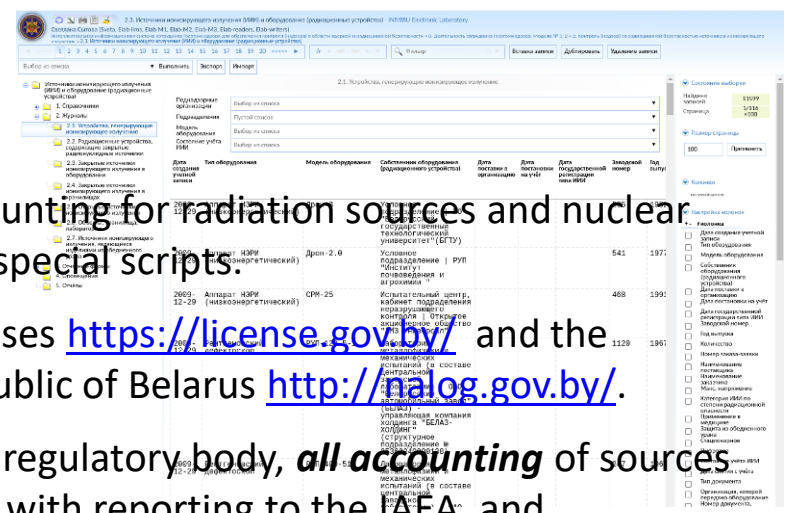
Implementation of the concept – Intellectual Information system

Data from the old databases of Gosatomnadzor on accounting for radiation sources and nuclear materials were loaded into the system with the help of special scripts

The system is connected to the Unified Register of Licenses https://license.gov.by/ and the database of the Ministry of Taxes and Duties of the Republic of Belarus http://nalog.gov.by/.

At present, in the Republic of Belarus at the level of the regulatory body, *all accounting* of sources of ionizing radiation, *all accounting* of nuclear material with reporting to the IAEA, and supervision of the construction of the Belarusian NPP are carried out with the help of the system.

The mechanism for parsing emails and electronic documents is implemented in the Submodule "Import-Export Permits" to automate the process of preparing permits for the import and (or) export of ionizing radiation sources restricted for movement across the State Border of the Republic of Belarus. This instrument can be used for processing of all other administrative procedures under the aegis of Gosatomnadzor in the frame of created portal.

Implementation of the concept – Portal BelNET

Bel arusian ***N*** uclear ***E*** ducation and ***T*** raining https://belnet.bsu.by


An original content management system eLab-Science was developed. Here all the necessary functions of the portal have been implemented, including the ability to remotely edit the portal structure and enter documents, various sorting and filtering, as well as two levels of access to documents depending on user rights, an original testing mechanism when performing laboratory work.

# BelNET in 2021 using Google counters:
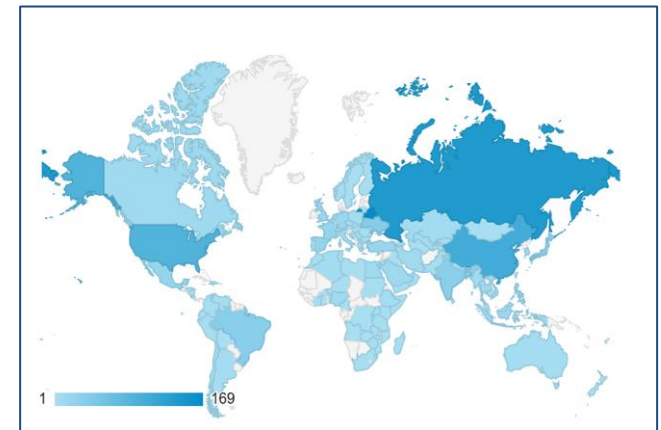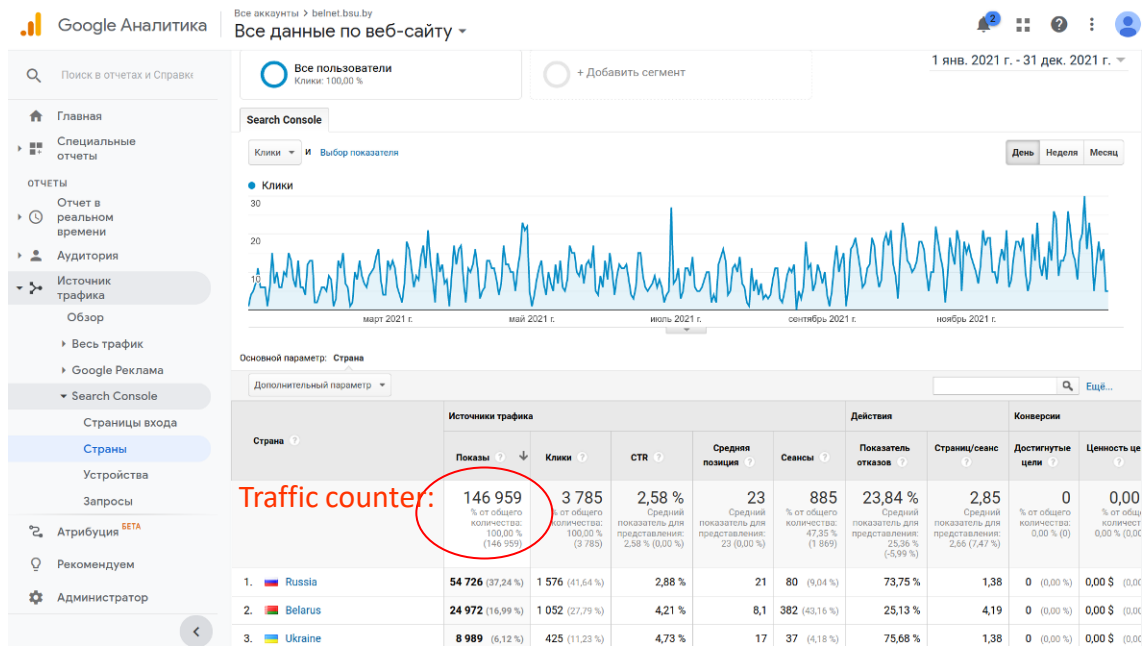
Transformation of BelNET

Portal of practical nuclear knowledge
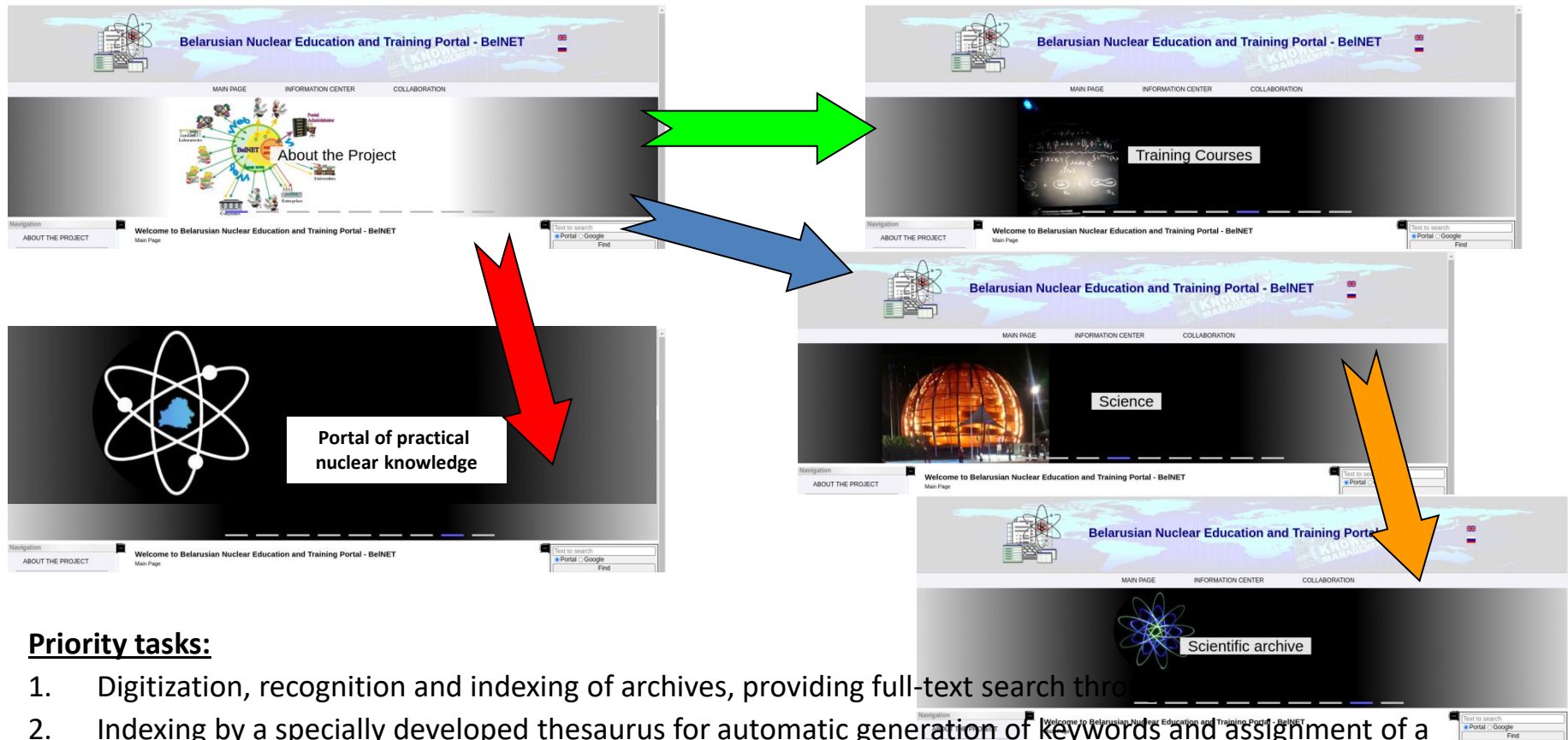
Priority tasks:

1. Digitization, recognition and indexing of archives, providing full-text search thro...
2. Indexing by a specially developed thesaurus for automatic generation of keywords and assignment of a resource to a particular section of the portal taxonomy.
3. Development of thematic ontologies (data structures with objects, links and rules). Data and ontologies together make up the knowledge base.
4. Development of a special English version of the portal.

What's in a name?   Nomen est omen…
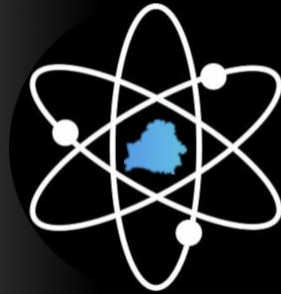
Portal of practical nuclear knowledge

It is planned to host the national portal of nuclear knowledge on Belarusian cloud platforms.

An Internet name can be fixed e.g. as https://nuclearportal.org.by/.

Developers are waiting for proposals for the name by e-mail: sytova@inp.bsu.by

"What's in a name? A rose by any other name would smell as sweet... "

Shakespeare

THANK YOU

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