Interregional Knowledge Management
Workshop on Life Cycle Management of Design Basis Information
Issues, Challenges, Approaches

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Introduction and objective

- It is evident that the design basis area is from the point of view of knowledge sharing extremely complicated.

- Time is changing and puts on us ever greater demands.

- We have to analyze the near and remote surroundings and have to simplified the problem of knowledge sharing in that area.

- I believe that it is graspable task for knowledge management and I will try to outline some possible context and approaches.
Contents of the presentation

- Work with data
- External influences
- The concept of remote and near surrounding areas
- Methods and tools of knowledge management
Work with data

- Stakeholders and communication
- Limiting factors
- Data, meta data and data to the data
- Data acquisition
- Specifics of data systems lifecycle
- Data integration
- Changes in time
- ...

- **Ensuring resources - people, time and finance**
Stakeholders

- Programmer
- Designer
- Manufacturer
- Investor
- General contractor
- Regulatory bodies, state and local authorities
- Operator
  - Operation and maintenance, especially outage management
  - Engineering
  - Long term operation
  - Decommissioning
  - ...

- Communications management
Communication

Formula for Number of Communication Channels

\[ N = \frac{n(n-1)}{2} \]

\( n \) = the number of communications stakeholders
Limiting factors

- Structure and number of limiting factors
- Legislation
- Capacity of data systems
- Portability of data and information
- Baud rate
- Formats normalization
- Displaying data
- Stability of networks and data warehouses
- External requirements
- ...

- Technical solutions
Data, meta data and data to the data

- Quantity of data
- Data structure
- Data format
- Work with data - processes and methods
- Speed of works with data (transmition, calculations, display, interaction, command execution)
- Data storage and data transmition
- ...

- Data management system
Data acquisition

- Intellectual property
- Restrictive measures (non-proliferation)
- Required attributes
- Measures, weights and units
- Data structures
- Language interface
- ...

- Standardization and Quality assurance
Specifics of data systems lifecycle

- Fast moving goods (SW a HW, Eprom cards)
  - Requirement for stabilization
- Long-term components (cabling)
  - Greater mobility requirement
- Operation after the end of lifecycle
  - The requirement to supply beyond the LC
  - Frontloading, reinstallation of production
- Live data and archiving
- ...

- Data lifecycle management
Data integration

- Excel, Word, PowerPoint
- Oracle, PassPort, SAP
- Plant Schama, AutoCad
- Primavera
- Data interface, graphical interface, MMI
- Document management systems and archiving
- Alphanumeric data integrators
- Graphical data integrator (EDU NPP MNT Graf)
- Multi D systems
- ...

- Configuration management systems
Changes in time

- Pre-design preparation - data selection, validation and verification
- Designing
- Design and production equipment
- The approval process
- Control of technology, innovation and changes
- Decommissioning and Disposal
  - Aging data
  - Aging equipment
  - Aging staff
- Updating IT systems a changes data requests in time
- ...

- Change management processes a systems
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External influences

- Social acceptability
- Technological innovation
- Changes in market of primary energy sources
- Investors environment
- Strategic priorities

**STEEP factors analysis**
Social acceptability

"JsteVy osobně pro rozvoj jaderné energetiky v naší republice?"

Source: MIT, Czech Republic
Technological innovation

Total installed capacity of VTE and installed capacity lower 10MW

Source: ERU, Czech Republic
Changes in market of primary energy sources

Development of gas prices in the U.S. and EU

Source: Bloomberg
Investors environment

Countries according to the relationship of the budget deficit to government debt

Data source: International Monetary Fund
Strategic priorities
World in Crisis?

Data source: International Monetary Fund
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Near and remote surrounding

Company
- Information: Secret, Patents, Tacit, Implicit, Explicit, Etc ...
- Investor
- Investors supplier
- Regulatory body
- Etc ...

Remote surrounding
- Competition in the industry
- Competition between the industries
- Etc ...

Radek Šula, IAEA, Vienna, 30-10-2013
Knowledge sharing

Source: Presentation: Znalosti a jejich řízení, Prof. Ing. Zdeněk Molnár, CSc, WEB, October 17, 2013, 17:17, https://www.google.cz/#q=Znalosti+a+jejich+%C5%99%C3%ADzen%C3%AD+Moln%C3%A1r+ppt
DATA > INFORMATION > KNOWLEDGE

- Traditional data
- Focus on results
- Data are collected traditional database techniques (eg SQL)

Select the name and age of the customers file, where the price of car > 100 000 € a type of car = sports

Source: Presentation: Znalosti a jejich řízení, Prof. Ing. Zdeněk Molnár, CSc, WEB, October 17, 2013, 17:17, https://www.google.cz/#q=Znalosti+a+jejich+C5%99%C3%ADzen%C3%AD+Moln%C3%A1r+ppt
DATA > INFORMATION > KNOWLEDGE

42% more expensive sports cars than 100,000 € buy men aged between 40-50 years

- Often necessary data
- Focus on aggregate data and calculated values
- Special software Products
DSS = Decision Support System

Source: Presentation: Znalosti a jejich řízení, Prof. Ing. Zdeněk Molnár, CSc, WEB, October 17, 2013, 17:17, https://www.google.cz/#q=Znalosti+a+jejich+%C5%99%C3%ADzen%C3%AD+Moln%C3%A1r+ppt
DATA > INFORMATION > KNOWLEDGE

To sales support of more expensive sports cars should be focus on middle-aged men.

- Generalized data and information
- Data mining discovers knowledge
- Technology includes deductive / inductive derivation
- Associative rules

Source: Presentation: Znalosti a jejich řízení, Prof. Ing. Zdeněk Molnár, CSc, WEB, October 17, 2013, 17:17, https://www.google.cz/#q= znalosti+a+jejich+%C5%99%C3%ADzen%C3%AD+Moln%C3%A1r+ppt
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KM roles, session, processes

Source: KM koncept, ČEZ, a.s. and Proneos GmbH

Radek Šula, IAEA, Vienna, 30-10-2013
Temelin KM koncept Summary

EXPERTS AND EXPERIENCE ON TEMELIN NPP

- Experience report
- Debriefing
- Experts profile
- Experts
- Plant management
- Knowledge manager
- Motivation
- Communication
- Information processing

After finalization role nomination, KM processes model and edition from tenderness fluent directorial documentation are create necessary conditions to operating Knowledge management in frames of standard management line

Next suitable significant task is preparation and realization subsidiary KM SW tools

Source: Author, ČEZ, a.s., 2010
Problem is in detail

- In designing we also need to reverse the process from the experience and knowledge to create information and data.
- It is important to be able to find the necessary level of knowledge sharing.

Source: Presentation: Znalosti a jejich řízení. Prof. Ing. Zdeněk Molnár, CSc. WEB, October 17, 2013, 17:17, https://www.google.cz/#q=Znalosti+a+jejich+%C5%99%C3%ADzen%C3%AD+Moln%C3%A1r+ppt
Development of knowledge
Public policies coordination
Development of knowledge

Tacit

Implicit

Explicit

Implicit

Tacit

Photo: Shutterstock
Barriers of Knowledge management culture

20% of cultural barriers is obvious
80% is hidden below the surface...

Five frequent obstacles for KM

1. I do not have time for other tasks!
2. Why do I have to do something extra?
3. Why risk the penalties that I will deal with sensitive topics?
4. Why should I share my knowledge?
5. Why should I add to it to be expendable in the long run?

These obstacles threaten the development of KM
They will not disappear by themselves.
We have to removed they actively!
By using persuasion and motivation.
Something KM positive to the end

Among the 300 oldest breweries are also representatives from the Czech Republic

<table>
<thead>
<tr>
<th>Year</th>
<th>Brewery Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1348</td>
<td>Klášterní pivovar Broumov</td>
</tr>
<tr>
<td>1499</td>
<td>Pivovar u Fleků (Praha)</td>
</tr>
<tr>
<td>1506</td>
<td>Zámecký pivovar Herold (Březnice)</td>
</tr>
<tr>
<td>1517</td>
<td>Měštanský pivovar v Poličce</td>
</tr>
<tr>
<td>1533</td>
<td>Hotel Zvon (České Budějovice)</td>
</tr>
<tr>
<td>1564</td>
<td>Svíjany, Soukromy pivovar</td>
</tr>
<tr>
<td>1570</td>
<td>Klašter, panství Jířího Labouňského z Laboně</td>
</tr>
<tr>
<td>1573</td>
<td>Pivovar Kutná Hora, součást tvrze Lorec</td>
</tr>
<tr>
<td>1581</td>
<td>Královský pivovar Krušovice</td>
</tr>
<tr>
<td>1582</td>
<td>Městský pivovar v Trutnově Krakonoš</td>
</tr>
</tbody>
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Thank you for your attention