

---

# Knowledge Preservation and Transfer: Issues and Terminology

---

**Tom Mazour**

(t.mazour@iaea.org)

**IAEA**

**Division of Nuclear Power**

1

International Atomic Energy Agency



## Contents

---

- **Knowledge: definition and implications for the preservation of knowledge**
- **Challenges to the knowledge of knowledge**
- **knowledge preservation strategies: personalization versus codification**
- **Means of tacit knowledge preservation**
- **Conclusions**

2

International Atomic Energy Agency



---

## Practical Definitions

---

**Information** is data that has been organized within a context and translated into a form that has structure and meaning.

**Knowledge** is the capacity for effective action; acquiring, understanding and interpreting of information.



## Practical Definitions

---

**Explicit knowledge** is embedded in documents, drawings, calculations, designs, databases, procedures or manuals.

**Tacit knowledge** is held in a person's mind and has typically not been captured or transferred in any formal way (if it was it would then be explicit knowledge).



---

## Practical Definitions

---

**Knowledge preservation** is a process for maintaining knowledge important to an organization's mission that stores knowledge/information over time and provides the possibility of recall for the future.

**Knowledge transfer** The transfer of knowledge in a broad array of settings: between individuals, groups of individuals, communities, organizations, or industries.



## Glossary of Knowledge Management Terms

---

**Draft provided in your materials. Your comments and suggestions are welcome!**



---

## How much is Tacit Knowledge?

---

**Up to 42% of the knowledge that professionals need to do their jobs comes from other people's brains—in the form of advice, opinions, judgment or answers. (Source: Delphi Group).**



## Some tacit knowledge can be articulated

---

- **It is important to distinguish between tacit knowledge that can be expressed/ articulated, and tacit knowledge that cannot be demonstrated and so is very difficult to transfer.**
- **Examples of each?**



---

**Steinway finds out that it has forgotten how to  
manufacture a piano.**

- **When piano manufacturer Steinway decided to resume the production of a model it had discontinued some time ago, the company discovered that it did not have any records or blueprints about how to produce the piano again, nor did it have anyone who had built this model.**



---

## **Challenges to Knowledge Preservation and Transfer**



---

## **Knowledge: An individual's perspective**

---

- **A person's capacity to act can be seen as the result of a five-fold integration process by which several kinds of knowledge are integrated:**
  - **technical expertise**
  - **methodological knowledge**
  - **social competence (getting along with others)**
  - **meta-knowledge (knowing where)**
  - **experience.**



## **Experience as a major threat to knowledge transfer and preservation**

---

- **Experience in a certain activity means that a person develops routines that allow him/her to solve problems better than people without the corresponding experience.**
- **Based on experience we do things we cannot easily articulate (sometimes not at all).**
- **Such knowledge is tacit knowledge that is personal, hard to transfer and difficult to preserve.**



---

## **Knowledge: An Individual's Perspective**

---

- **All knowledge an individual has is the result of a personal learning history.**
- **Learning is always shaped by the context in which a person's learning takes place.**
- **Learning and knowledge accumulated in a certain context may not be actionable in a different context.**
- **Thus, organizational context always has to be considered as a variable in knowledge transfer and preservation activities.**

13

International Atomic Energy Agency



## **The Loss of Experts Poses a Fivefold Challenge**

---

- **Preservation of technical expertise**
- **Preservation of methodological knowledge**
- **Preservation of social competence**
- **Preservation of experience**
- **Preservation of meta-knowledge**

14

International Atomic Energy Agency



---

# Knowledge Preservation and Transfer Strategies

15

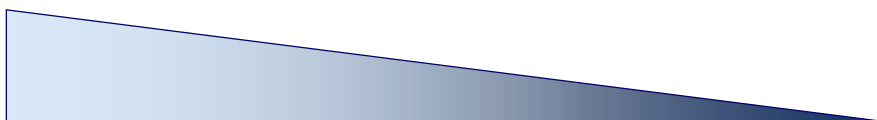
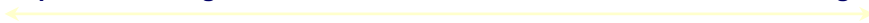
International Atomic Energy Agency



## Knowledge Continuum

Explicit Knowledge

Tacit Knowledge



**Complete  
Articulability:**

**Limited  
Articulability:**

Strategy → Capture

Strategy → Connectivity,  
People as Knowledge Repositories

**CODIFICATION**

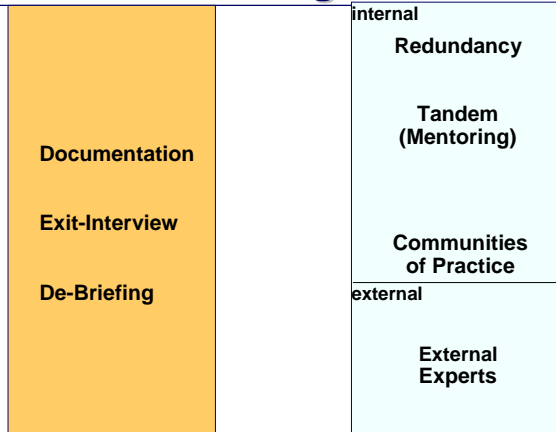
**PERSONALIZATION**

16

International Atomic Energy Agency



## Basic knowledge preservation and transfer strategies



CODIFICATION

PERSONALIZATION

17

International Atomic Energy Agency



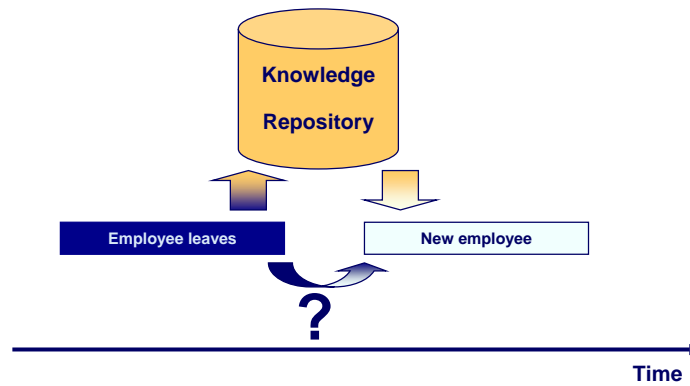
## Means of Knowledge Preservation and Transfer

18

International Atomic Energy Agency



## Codification: Creating a Knowledge Repository



19

International Atomic Energy Agency



## Documentation

- Often, employees declare not to have the time to document.
- Often enough, the lack of time is an excuse for not being interested in documenting.
- Documentation can be a good means to knowledge preservation for articulated knowledge.
- Documentation fails with tacit knowledge.
- Problem: documents are not always clear, they are interpreted by others (thus creating a source of errors)

20

International Atomic Energy Agency



---

## Exit Interview

---

- In a relaxed atmosphere the employee discusses what is important to his/her job
- What are the important documents, manuals and where can they be found?
- What problems are likely to appear? What is to do when this or that happens?
- Limits: People remember only 20 percent of what they really know, and remembering takes place related to the context.



## De-Briefing

---

- Very important for holders of critical knowledge.
- Objective: Make tacit knowledge explicit and available to other members of the organizations.
- De-briefing can take place in two modes: oral or video.
- High costs: several days of preparations for the debriefing team
- Duration of De-Briefing: depending of experts one to several days



## Redundancy

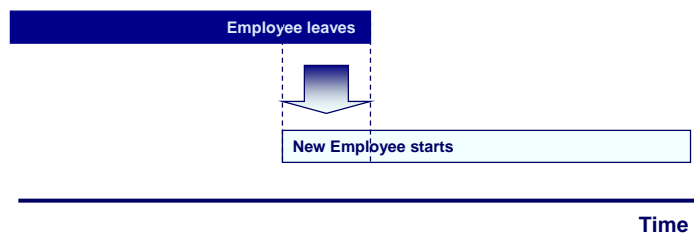
- Best possible solution for knowledge preservation and transfer.
- Works in all situations of knowledge loss (even unexpected ones)
- Is based on availability and motivation of personnel.

23

International Atomic Energy Agency



## Mentoring (Tandem)



24

International Atomic Energy Agency



## Mentoring

- **Second-best solution.**
- **The new employee's learning curve is compressed by the help of the mentor.**
- **The mentor serves as a model and allows the new employee (apprentice) to quickly develop his/her capacity to act.**
- **Example: Swiss Nuclear Power Plants**
- **Needs: Availability of skilled mentors and apprentices**

25

International Atomic Energy Agency



## People-Based Knowledge Repository: Community of Practice



26

International Atomic Energy Agency



---

## Community of Practice

---

- **Multiple redundancy**
- **Needs:**  
**Organizational, national or even supra-national coordination.**
- **Examples( national , international professional organizations, international knowledge preservation initiatives...)**



---

## Conclusions



---

## Conclusions

---

- **Tacit knowledge preservation and transfer are more difficult than explicit knowledge preservation. However, they get less focus and attention.**
- **Tacit knowledge preservation and transfer activities require a large amount of work.**
- **Face-to-face tacit knowledge transfer is preferable although often not possible.**

