

**Enabling Factors of Knowledge Management:
A Study in the context of a Fast Reactor
Research and Development Organization**

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*For Countries in the vanguard of the world economy, the balance between knowledge and resources has shifted so far towards the former that **knowledge** has become perhaps the most important factor determining the **standard of living** more than land, than tools, than labor.*

-World Development Report 1998

Nuclear Knowledge Management

- Nuclear Technology
 - Highly Technical endeavor
 - Innovative Creation, Storage and Dissemination
 - Long time scales & technological excellence
- Early Nuclear Reactors: 20 years
 - Life extension
- Current reactors : 40 - 60 years
- Decommissioning & Decontamination : Few decades
- Total life span of more than 100 years
 - Challenge of retaining knowledge for 3 generations.

Nuclear KM contd.

- It is essential to preserve scientific knowledge & historical perspective of the developments of more than 60 years of nuclear power history.
- Many innovations were made.
 - Some are successful.
 - Some have to be tested. (Thorium fuel, heavy metal coolant).
 - Some are abandoned (Carbonic acid, gaseous coolants)
- This knowledge & history is essential for future designers so that they need not reinvent.

Mission of IGCAR

- ✓ *To conduct a broad based multidisciplinary programme of scientific research and advanced engineering development, directed towards the establishment of the technology of Sodium Cooled Fast Breeder Reactors (FBR) and associated fuel cycle facilities in the Country.*
- ✓ *The mission includes the development and applications of new and improved materials, techniques, equipment and systems for FBRs.*
- ✓ *Pursue basic research to achieve breakthroughs in fast reactor technology.*

Vision Statement

To be a global leader in sodium cooled fast breeder reactors and associated fuel cycle technologies by the year 2020 AD

Steps involved in Developing Knowledge Management System

- Create, Capture, Store and Share Knowledge.



- Locate relevant Knowledge.



- Provide an environment for knowledge exchange.



- Connect people of common interest.



- Facilitate and support intelligent Problem solving.



Source : Tusi 2003

Information & Communication Technology is an important enabling factor in each of the steps.

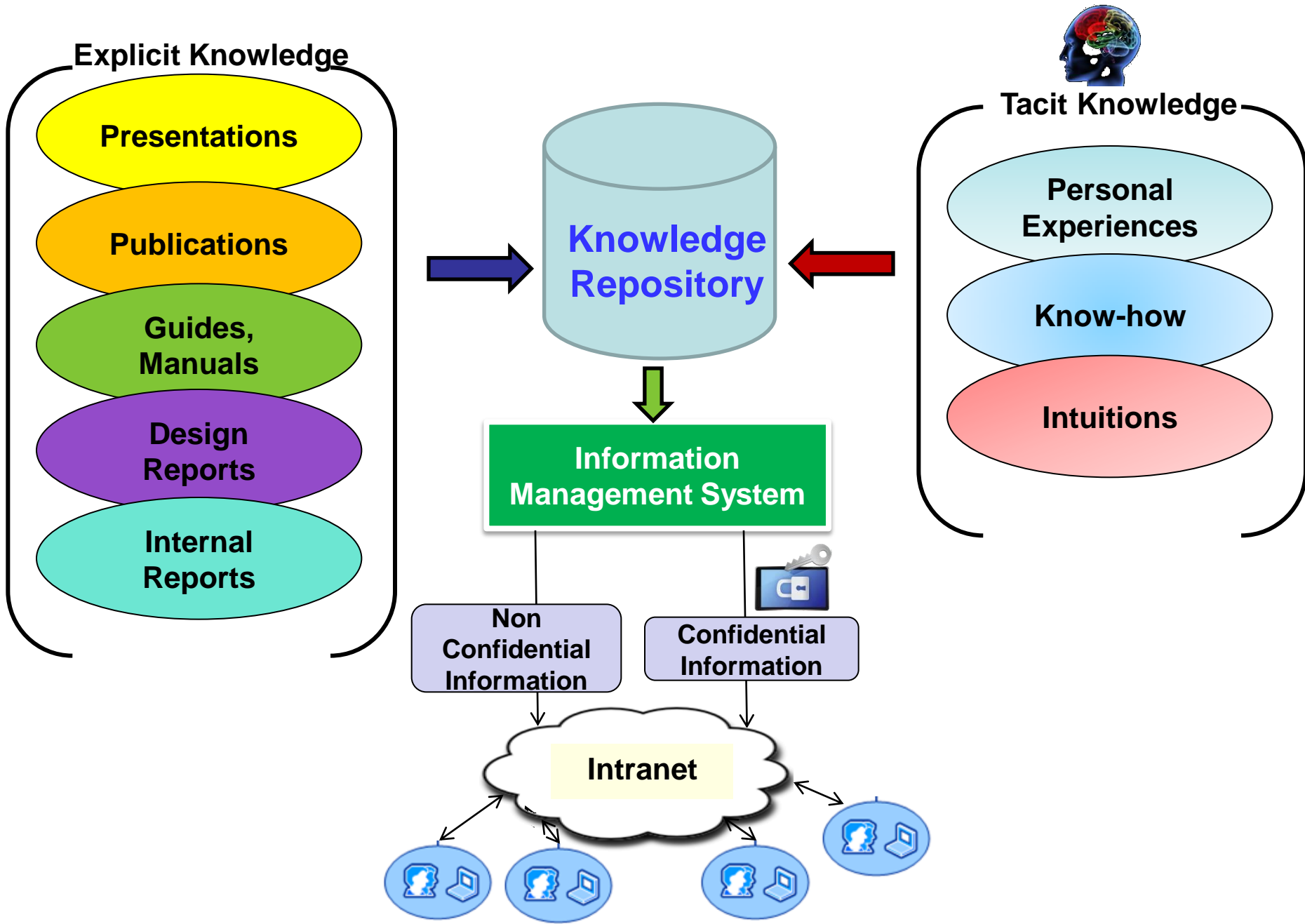
KM @ IGCAR

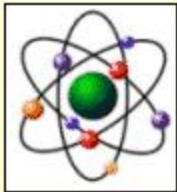
- We have High performance computers and Advanced CAD Packages for generating the Knowledge.
- Information Management Web Servers with high storage capacity and NAS devices for storage.
- High Speed Internet and Intranet Connectivity (1 Gbps) connecting all the PCs for dissemination.
- Scanners for digitization.
- Audio Visual Systems.
- Video Conference System.

Implementation of KM at IGCAR

- Written KM Policy and road map.
- Web based Information Management Server
- Explicit knowledge is ported to the server.
- Old design reports, System Manuals, training manuals of FBTR are digitized.
- Tacit Knowledge of retiring employees through exit interviews, serving employees through periodic lectures, internal reports.
- Access control mechanism

Knowledge Bank of IGCAR





IGAR INFORMATION & KNOWLEDGE MANAGEMENT SYSTEM

- [DIRECTOR'S DESK](#)
- [IGCIMS](#)
- [ORGANISATION](#)
- [BENCHMARKS](#)
- [KM POLICY](#)
- [KM AWARENESS](#)
- [TACIT KNOWLEDGE](#)
- [TEL &E-MAIL DIR](#)
- [ISO](#)

- ACCOUNTS
- ADMINISTRATION
- CG
- EIRSG
- ESG
- FRFCF
- FRTG
- MMG
- MSG
- RDG
- RMG
- ROMG
- RPG

Our Primary Mission....



To conduct a broad based multidisciplinary programme of scientific research and advanced engineering development, directed towards the establishment of the technology of Sodium Cooled Fast Breeder Reactors (FBR) in the Country. The mission includes the development and applications of new and improved materials, techniques, equipment and systems for FBRs.

Dr. P.R. Vasudeva Rao
Director, IGAR



- Webstracts
- India's Reactors
- Annual Report 2008-DAE

FAST REACTORS FOR ENERGY SECURITY

You are Visitor No: 1686
From 04-04-2011

ENABLING FACTORS

- Organizational Culture
- Organizational Processes
- Management Support
- Technology Infrastructure

STUDY

- Survey Method
- Twenty one Enabling Factors

ORGANIZATION

| Sl.No. | Inhibiting Factors | Mean | SD | PR |
|--------|---|------|------|-------|
| 1 | User friendly technology infrastructure | 4.10 | 0.81 | 77.55 |
| 2 | Integration of the process of contribution with day-today work | 4.08 | 0.85 | 78.36 |
| 3 | Awareness of knowledge requirements | 4.03 | 0.87 | 82.04 |
| 4 | Awareness on the significance of the contribution to the organization | 4.01 | 0.99 | 75.10 |
| 5 | Feedback | 4.00 | 0.85 | 77.95 |
| 6 | Awareness of the process of contribution | 3.89 | 0.80 | 73.77 |
| 7 | Adequate time | 3.72 | 1.00 | 68.16 |
| 8 | Assurance against negative reverse impact | 3.71 | 1.02 | 64.08 |
| 9 | Expertise in organizing the available Knowledge | 3.71 | 0.92 | 64.89 |
| 10 | Awareness of the utility of the contributions | 3.68 | 0.95 | 64.48 |

| Sl.No. | Inhibiting Factors | Mean | SD | PR |
|--------|--|------|------|-------|
| 11 | Assurance on meeting the knowledge requirements by the organizational knowledge repository | 3.58 | 0.98 | 56.79 |
| 12 | Protection of intellectual property | 3.50 | 1.17 | 53.87 |
| 13 | Recognition | 3.35 | 1.12 | 48.57 |
| 14 | Weightage for contribution in performance appraisal | 3.34 | 1.19 | 51.42 |
| 15 | Assistance in contribution | 3.31 | 1.12 | 48.97 |
| 16 | Directive from the reporting officer | 3.27 | 0.98 | 40.00 |
| 17 | Gratefulness | 3.17 | 1.10 | 37.14 |
| 18 | Tangible reward | 3.12 | 1.14 | 36.32 |
| 19 | Mandatory organizational policy on contributions | 3.09 | 1.16 | 37.55 |
| 20 | Contributions from colleagues | 3.09 | 1.07 | 34.69 |
| 21 | Assurance against belittling by colleagues | 3.00 | 1.05 | 31.02 |

GROUPS

| Sl.No. | Predominant Inhibiting Factors | Mean | SD | PR |
|--------|---|------|------|-----|
| G1 | Feedback | 4.56 | 0.53 | 100 |
| G2 | Integration of the process of contribution with day-today work | 4.09 | 0.7 | 86 |
| G3 | Awareness of the process of contribution | 4.08 | 0.72 | 84 |
| G4 | Integration of the process of contribution with day-today work | 4.44 | 0.73 | 87 |
| G5 | Integration of the process of contribution with day-today work | 4.38 | 0.63 | 82 |
| G6 | Awareness on the significance of the contribution to the organization | 4.43 | 0.49 | 100 |
| G7 | Awareness of knowledge requirements | 4.28 | 0.67 | 88 |
| G8 | Awareness on the significance of the contribution to the organization | 4.32 | 0.98 | 82 |
| G9 | Awareness of the process of contribution | 4.14 | 0.53 | 93 |
| G10 | User friendly technology infrastructure | 4.23 | 0.6 | 91 |

Inhibiting Factors and action Taken

- User friendly technology infrastructure
 - ICT improved and made accessible to all employees.
- Integration of the process of contribution with day-to-day work
 - Dynamic Portal with work automation.
- Awareness of knowledge requirements
- Awareness on the significance of the contribution to the organization
 - Awareness lectures in all Groups.
- Feedback
 - Knowledge Quality index for documents
 - Facility for feedback/suggestions

Nuclear Work Force Succession Planning

- In many countries, large number of Nuclear work force is retiring.
- The Nuclear facilities can not function with out a “Critical Mass” of competent personnel.
- An effective succession planning is essential for the safe and continued operation of nuclear facilities.
- These new personnel have to be in place with an overlapping time along with the retiring people so that they can transfer their knowledge to their successors.

In IGCAR Succession Planning is inbuilt in to the system

Manpower Training & Mentoring

- A training school is established at IGCAR to impart specialized training in Fast Reactors and related domains.
- The classes are taken by practicing engineers and scientists. This enables successful transfer of tacit knowledge of the senior scientists/engineers to the trainees.
- Mentoring is a continuous process at IGCAR.
- Officials are encouraged to participate in various National and International Conferences etc.
- Collaborations with many reputed educational institutions and R&D labs of national & international repute.

This has been a great Enabling Factor in IGCAR for KM

Knowledge Loss Risk Assessment

- Every Organization has to periodically do Knowledge Loss Risk assessment.
- The total risk factor for each employee is based on the projected attrition date, the criticality of the knowledge and Skill (Position Risk factor) possessed by the employee.
- Once the Knowledge Risk assessment is done, the management has to device means by succession planning and by capturing the critical knowledge.
- The process has to be monitored and evaluated periodically.

Source: Risk Management of Knowledge Loss in Nuclear Industry Organizations : IAEA

Summary

- Knowledge Management is very important for every organization.
- Knowledge Management is more important for Nuclear Organizations because of long time scales involved.
- Effectiveness of KM Implementation shall be reviewed periodically.
- Training of new officials and succession planning are essential for successful KM implementation in any organization.

THANK YOU