Transferring Critical Knowledge To Maintain Competitiveness

APQC Knowledge Management Conference
May 2, 2013

Nanako Mura
Jean-Francois (Jef) Tendron
Competitive advantage is created by a company’s most skilled people
AGENDA

❖ Background
❖ Knowledge Capture/Transfer Strategy
❖ Approach
❖ Implementation- Knowledge Books
❖ Tracking and Lessons Learned
Events resulting in the need for knowledge capture and transfer

- Retirements
- Internal moves
- Attrition
- R&D center relocation
- Geographic expansion
- Re-structuring
- Spin-off/divestiture

Catalyst
SHARED KNOWLEDGE AREAS
Beverage
Cheese
Research & Nutrition
Packaging Research
The Challenge

Equip each company with the technical knowledge required to ensure business continuity, self-sufficiency and to preserve competitive position.
Intellectual Capital
Knowledge and assets that can be exploited to generate business value and maintain competitiveness

People
• Organizational skills and competencies
• Know How

Documents
• Specifications
• Technical and Project Reports

Intellectual Property
• Patents & Trademarks
• Trade secrets
Getting Started

- Strategy and Approach
- Linkage to Business Unit and Function VP’s
- Workplan and Readiness Assessment Templates
- Budget requirements
- Technology enablers
- Tracking and Reporting
- R&D wide communications
Defining Critical Knowledge at Risk

Key criteria for selection and prioritization:

✓ **Mission critical** - needed to support current and future business strategies and/or

✓ **Current core competency** that helps drive competitive advantage. Leader in the field

✓ **Not readily accessible** – difficult to find documentation, no cohorts to lever

✓ **Rare or unique**, resides with 1 expert at risk of losing and expertise not available externally

✓ **Stabilized**- knowledge area not likely to evolve and become obsolete or be replaced
Defining Critical Knowledge at Risk

Other considerations

✓ **History of the knowledge** built over long time and is it critical?

✓ **Adaptable**—can be applied to more than one category or business

✓ **Current experts depth of knowledge** – do they really have the knowledge needed?

✓ **Willingness of experts**– voluntary or involuntary departure?
Defining Critical Knowledge at Risk

Priority Areas for Knowledge Capture and Transfer:

- **Overlapping Businesses**
  - Cheese
  - Dairy Technology
  - Coffee
  - Powdered Beverages

- **Corporate Research and Quality**
  - Packaging technologies
  - Ingredient & process technologies
  - Nutrition research
  - Quality and Food Safety
Where possible, experiential knowledge transfer approaches were employed.
Various capture/transfer approaches were used

<table>
<thead>
<tr>
<th>Approach</th>
<th>Description</th>
<th>Best Used When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Shadowing/ Apprenticeship</td>
<td>Successor works on the job with expert</td>
<td>• Successor identified&lt;br&gt;• Time and resources can be freed up to work together for several months</td>
</tr>
<tr>
<td>Short Term Assignment</td>
<td>Successor spends 2-3 weeks intensively doing work w/expert</td>
<td>• Successor identified&lt;br&gt;• Time and funding available&lt;br&gt;• Clarity on knowledge areas to focus</td>
</tr>
<tr>
<td>Knowledge Books</td>
<td>Knowledge capture through in depth interviews. Champion uses and socializes knowledge</td>
<td>• Benefits multiple individuals&lt;br&gt;• Champion clearly identified&lt;br&gt;• Little documentation on critical knowledge exists</td>
</tr>
<tr>
<td>Job &amp; Knowledge Mapping</td>
<td>Detailed mapping of job responsibilities and knowledge needed to complete tasks/role</td>
<td>• Successor identified to review map with SME&lt;br&gt;• Limited time for 1:1 discussions&lt;br&gt;• Adequate supporting documentation exists or can be developed</td>
</tr>
<tr>
<td>Documentation</td>
<td>Required Tech Reports identified for documentation.</td>
<td>• Deep understanding of knowledge not required&lt;br&gt;• Experts remaining with some knowledge and experience on the topic with existing docs avail&lt;br&gt;• Complement to other methods above</td>
</tr>
</tbody>
</table>
But... there were many challenges to knowledge capture and transfer

- Highly valued experts tend to be very busy working on projects
  - Use methods that do not require experts to do a lot, take lots of their time

- Experts tend to keep their knowledge close in
  - Ensure recognition by senior leader, validation as technical expert.

- Experts don’t realize everything that they know
  - Have someone else elicit knowledge
  - Use someone outside of expertise area

- Experts are not good at organizing their knowledge or eliciting their know-how
  - Lever an expert that knows how to model and structure knowledge
But... there were many challenges to knowledge capture and transfer (cont’d)

- Some experts leaving involuntarily did not agree to elicit knowledge
  - Proactively capture knowledge as a strategic priority BEFORE involuntary reductions
  - Engage manager to gain cooperation and to understand their concerns

- Experts don’t know what others need to know
  - Request feedback from recipients and their managers

- Recipients don’t always know what they need to ask for
  - Conduct job mapping exercise on expert
  - Institute “dry runs”
Knowledge Books employ the MASK method for knowledge capture

(`Method for Analyzing and Structuring Knowledge`)

- First developed for the French Atomic Energy Commission
- Later developed at academic institutions
- Further developed through applications in large companies
MASK METHOD
6 MODELS

Observation
Knowledge

- Phenomena
- Context
- History
- Task
- Sense
- Evolution

Information

Modeling fields
MASK METHOD
Knowledge modeling steps

- Scoping Interview
- Knowledge Conversation 1 (Immersion)
- Knowledge Conversation N
- Integration of relevant documents
- Validation
- Sharing

All interviews are recorded
KEY SUCCESS FACTORS

- The expert(s) must be available
- The requests of the future recipients must be taken into account
- The existing relevant documentation must be indexed by the knowledge book (this task should NOT be underestimated)
- The knowledge book must be a living object: a champion should be identified to own it and socialize it within the organization
- The basis of the knowledge must be stabilized (80 stabilized / 20 exploratory)
- Human factors
Scoping Interview

• Define the breadth and depth of knowledge areas
• Identify areas for focus
• Validate and obtain feedback from manager, recipients
• Non-exhaustive list
Content focused on starch know how in RTE desserts that could include:
- Performance of starch in pudding application
- Understanding of how, when and why a particular starch is used in dessert systems
- Differences in performance between plant lines
- Ingredient interactions
- Potential issues and watch outs
- Differences between starches on sensory characteristics
Process Step: A

- Knowledge of... link to reference

Hydrated ingredients

- Ingredient list

Tank

- Comments on potential watch outs, description of what might be happening within the food matrix in the tank, critical sensitive process parameters etc.

- Knowledge of... link to reference

Process Step C

- Description and picture of equipment
- Comments on the function of this step in impacting texture, flavor or other characteristics

- Ingredient
- Ingredient

- Equipment name
- Knowledge of

Process Step E

- Knowledge of...

In process product

Process Step F

- Comments about how the step might differ between plants

Final solution

- Comments about the process step that is not in the process operating guide
- Comment about the ingredient and why used

To Hold tank

Highlight/summary statement
Phenomenon Model

- Fat Kinetics
- Protein Separation
- Gelation

Influence

- Parameters in the environment (outside the phenomenon itself) that may influence (positively or not) the phenomenon (constraints, perturbations ...)

Source

- Location where we observe the activation of a flow
- Activation of one or several types of flows (source phenomena)

Flow

- Emission
- Propagation
- Reception

Target

- Location where we observe the action of the flow
- Effect(s) of the reception of the flow (target phenomena)

Comments and/or characteristics :
- C1
- C2

Triggering event coming from the environment:
- positive / negative
- causal / not causal
- random/ not random ...

Consequences due to the global phenomenon:
- positive/negative
- happy/unhappy
- wanted/unwanted
- ...
How to describe the history of the domain?

1. **Time-line A**
   - **Product Development**
   - Generation 1 → Generation 2 → Generation 3
   - Objective

2. **Time-line B**
   - **Packaging Development**
   - Generation 1 → Generation 2
   - Objective 1 → Objective 2

3. **Time-line C**
   - **Product Launch**
   - Generation 1 → Generation 2
   - Milestone (date)
TABLE OF CONTENTS

Direct links to sections make it easy for the reader to find specific knowledge

Ingredients
- Main ingredients
- Ingredient category A
- Ingredient category B
- Ingredient category C

Process
- Process overview
- Sub process step S
- Unit operation X
- Unit operation Y
- Unit operation Z

Other Topics
- Suppliers
- Defects/Troubleshooting
- Packaging Materials
- Trials
- External Research
- Quality & Food Safety
The completed Knowledge Book is in editable power point form
Benefits

- User friendly
- Mirror effect for experts. Validation of their expertise.
- Recognition of experts by senior leaders
- Complements training efforts
- Sets foundation to build upon the knowledge

“I found it extremely enlightening because it highlighted and put structure on what we learn. Often we create knowledge in seemingly random efforts, but this exercise help organize our areas of expertise and even highlight areas that could use more attention in the future” – Kraft expert
## High Level Work Plan and Readiness Assessment

### Technology/Platform

<table>
<thead>
<tr>
<th>Area</th>
<th>Responsible</th>
<th>Work Plan</th>
<th>Recipient</th>
<th>Timing</th>
<th>Resource Needs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project A</td>
<td>Name</td>
<td>2 trips to Munich (pilot plant trials)</td>
<td>Name</td>
<td>Date</td>
<td>$$-Where Allocated</td>
<td>1 trip complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2\textsuperscript{nd} trip being scheduled</td>
</tr>
<tr>
<td>Project B</td>
<td></td>
<td>1 trip to Chicago</td>
<td></td>
<td></td>
<td>$$</td>
<td>complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>File Tech Report (s) on XYZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project C</td>
<td></td>
<td>1 trip to Chicago</td>
<td></td>
<td></td>
<td>$$</td>
<td>complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>File invention disclosure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topic Areas (eg. Dairy, flavor chemistry)</td>
<td></td>
<td>Short term assignment</td>
<td></td>
<td></td>
<td></td>
<td>Delayed</td>
</tr>
<tr>
<td>Knowledge Book–Technical area</td>
<td></td>
<td>SME name</td>
<td>Champion name</td>
<td></td>
<td></td>
<td>In progress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SME name</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Reports in R&amp;D Suite</td>
<td>Coordinator</td>
<td>List of critical tech reports</td>
<td>Various</td>
<td></td>
<td>NA</td>
<td>Tracking well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Separate tracker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharepoint Teamsites</td>
<td>Owner</td>
<td>Name of teamsites</td>
<td>Recipient site owner</td>
<td></td>
<td></td>
<td>In progress</td>
</tr>
</tbody>
</table>
# Documentation Tracking

## Department Manager Responsibility

<table>
<thead>
<tr>
<th>Department Name:</th>
<th>Storage Location</th>
<th>Complete (✓/✗)</th>
<th>Name</th>
<th>Name</th>
<th>Name</th>
<th>Name</th>
<th>Name</th>
<th>Name</th>
<th>Name</th>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOPIC AREA 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 1</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 2</td>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 3</td>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOPIC AREA 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 1</td>
<td>T</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 2</td>
<td>T</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 3</td>
<td>T</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 4</td>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOPIC AREA 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 1</td>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 2</td>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 3</td>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOPIC AREA 4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 1</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 2</td>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOPIC AREA 5</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 1</td>
<td>T</td>
<td>✗</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 2</td>
<td>T</td>
<td>✗</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 3</td>
<td>T</td>
<td>✗</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
R&D Suite is the key enabler for capture and reuse of explicit knowledge
Tech Reports Published 2005 to 2012

- 2005: 275
- 2006: 241
- 2007: 214
- 2008: 343
- 2009: 268
- 2010: 307
- 2011: 351
- 2012: 2368

- Downward trend
- Proactive advocacy
- R&D Suite Introduced
- Knowledge Capture Initiative
Summary & Lessons Learned

- Knowledge initiatives must be business driven
- Be proactive versus reactive
- Engage the organization up, down and across
- When identifying critical knowledge areas—ask, trust but verify if possible
- Create accountability through visibility
- Give knowledge holders recognition
- Keep track of your retirees
- Be good to your consultants. Knowledge capture is a tough job!
THANK YOU!!

Nanako Mura
nmura@kraftfoods.com

Jef Tendron
jf.tendron@kadrant.com