Global Knowledge Management

Process Integration of Business, Learning, and Knowledge Processes

Jan M. Pawlowski
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The Challenge

- Going one step further: Re-Design of Knowledge, Learning and Business Processes -> fostering synergies
- Understanding inter-departmental and inter-organizational processes and interdependencies
- Optimizing processes, utilizing synergies – process, service or data integration
Bridging the gap between KM and e-learning

Organizational development

Knowledge Management

- CKO, Knowledge worker
- Internal Consulting-Group
- Business Unit Knowledge Manager

Educational Management

- CLO
- Personnel/HR Unit
- Personnel Development
- Corporate University
- Training Unit
The role of technology
KM-focus vs. e-learning focus

- people-to-people
  - Problem solving by building learning communities
  - Supporting communication (synchronous and asynchronous)
  - Finding experts
- OL + meta-learning
- people-to-documents
  - Supports through documents, archives
  - Classification, searching, extraction

- teaching / training
  - Independent of time and location
  - Testing, examinations
  - Re-training
- Content and learning objects
- Supporting individual learning
- institutionalized, intentional
- Blended learning concepts
- Virtual classroom

happens in a work environment…

usually separation from work environment…
Possible convergence targets

• Shift the focus of KM initiatives from knowledge sharing to support actual learning from others and actual applying experiences of those other people.

• Change working environments to encourage knowledge sharing and workplace learning and to provide time, space and instruments to do so.

• Use of existing communities of practice instead of forming a community around a learning event. Promotion of learning communities after a course.
The relationship between the business strategy & eLearning and the business strategy & Knowledge Management?

Learning

- loose coupling with the business strategy

Knowledge

- close coupling with the business strategy
Place, time, and way of acquiring knowledge

Where is new knowledge acquired? How is this organized regarding work-time management and regarding individual needs?

**Learning**
- in seminars and conferences, at home
- in larger blocks
- with rather weak personalization

**Knowledge**
- at the workplace
- in short units with interruptions through regular work
- trend to personalization
Cultural Aspects

How about attitudes and behavior of the target groups of eL und KM measures when learning or acquiring new knowledge?

Learning
- skeptical towards techn.
- competition and “one-man-shows”
- comparatively intensive guidance and tutoring
- push-principle

Knowledge
- open towards technology
- cooperation in communities, peer-learning
- highly self-responsible
- pull-principle
Measurement of success

- institutionalized through assessments, exams, certificates

- rather weekly structured; often as part of regular employee assessment
Step 1: documentation of the business processes

Preperatory activities
Comparing knowledge demand / knowledge supply

Step 2: Implementation of a reference model
Integration into a knowledge life cycle

Step 3: Implementation of supporting IT systems

Step 4: Continuous process improvement
Integration: Questions

- Which processes and systems can be integrated?
- Which and how processes should be redesigned?
- Which information / data should be shared?
- Which actors should be involved in cooperative processes?
Integration of E-Learning and KM

Requirements analysis

Design

Implementation

Test

Roll Out

Business Process

Knowledge and competency requirements and needs

Problem descriptions and solution:
Context, sequences, experiences, actors

Scenario extraction:
sequences, contents

Learning experiences

Scenario extraction:
sequences, contents

Knowledge and competency requirements and needs

Context, sequences, experiences, actors

Knowledge Management

Learning Management

Knowledge Management
## Conceptual Integration

<table>
<thead>
<tr>
<th>Criterion</th>
<th>KM</th>
<th>E-Learning</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Group</td>
<td>Organizational</td>
<td>Individual</td>
<td>Reinmann-Rothmeier, 2000 (Munich Model)</td>
</tr>
<tr>
<td>Complexity</td>
<td>Knowledge as contextualized information</td>
<td>Learning as the process of assimilation</td>
<td>North, 1998</td>
</tr>
<tr>
<td>Time</td>
<td>On demand</td>
<td>On stock</td>
<td>Kraemer, Milius, 2000</td>
</tr>
<tr>
<td>Objective</td>
<td>Problem-oriented</td>
<td>Not specified</td>
<td>Mandl, Winkler, 2003</td>
</tr>
<tr>
<td>Formality</td>
<td>Non-formal / informal</td>
<td>Formal</td>
<td>Watkins, Marsick, 1992</td>
</tr>
</tbody>
</table>
## Sample Integration Approaches

<table>
<thead>
<tr>
<th>Objective</th>
<th>Method</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration of collaborative knowledge and learning processes</td>
<td>Systems development based on empirical surveys</td>
<td>Kienle, 2003</td>
</tr>
<tr>
<td>Integration of strategy and processes</td>
<td>Conception and implementation of integrated processes</td>
<td>Sridharan &amp; Kinshuk, 2002</td>
</tr>
<tr>
<td>Architecture</td>
<td>Taxonomy of contents</td>
<td>Wilkinson, 2002</td>
</tr>
<tr>
<td>Integration / interoperability</td>
<td>IMS Learning Design</td>
<td>Benmahamed, Ermine, Tchounikine, 2005</td>
</tr>
<tr>
<td>Competency development</td>
<td>Framework for competency mapping and development</td>
<td>Ley, Lindstaedt, Albert, 2005</td>
</tr>
</tbody>
</table>
Types of Integration

- General integration types
  - Processes
  - Service
  - Data

- In details, this could be…
  - Data integration: Data is exchanged between and retrieved from several, usually heterogeneous sources.
  - Application interface integration: Well defined interfaces define the re-use of components and logic of programs.
  - Method integration: The method to handle a business process is re-used.
  - Portal integration: Portals can integrate components of heterogeneous applications.
  - Process integration: Processes are re-designed, re-organized and integrated.
Integration levels (1)

- **Process Overlaps**
  - Identifying processes with similar objectives, tasks and outcomes
  - Combining processes towards a connected, inter-related process
  - Example: Experience sharing as part of all business processes

- **Shared Services and Systems**
  - Identifying common services and systems
  - Example: “staff administration” is a service which is used by different departments or systems
Integration levels (2)

**Information / Data Integration**
- Identifying overlaps in information / data models of an organization
- Example: Actor data is used by different departments / systems

**Cooperation process**
- Identifying interdependencies between actors and organizational units
- Defining modes of cooperation in
  - the integration processes
  - daily operations
Integration support

- Use reference models and standards
- Develop services and information
- Integrate knowledge processes…
Step by step integration

1. Awareness building and context setting
2. Process analysis and redesign
3. Shared services’ and systems’ design
4. Information and data integration
5. Evaluation and validation
Awareness Building and Context Setting

- Integration is a major organizational change
- Barriers
  - Fear of change
  - Loss of responsibilities / power
  - Time
  - …
- Preparing actors for change processes
- Ensuring involvement and participation
- Developing a common vision
Process analysis and redesign

- Objectives
  - Identifying relevant processes for consideration
  - Forecasting synergy effects
  - Understanding the organization

- Phases
  - Process Modeling
  - Process Analysis
  - Process Redesign

- Outcomes
  - Process Models
  - Process Re-Design
  - Implementation Plan
Process analysis and redesign

- **Process Identification and Modeling**
  - Processes in the relevant departments are modeled
  - Including actors involved and systems used
  - Use of reference models should be considered

- **Tools**
  - ISO/IEC 19796-1 for Learning Processes
  - Knowledge Management Processes
  - ebXML for Business Processes
## Analysis Grid

<table>
<thead>
<tr>
<th></th>
<th>Manufacturing</th>
<th>Human Resources</th>
<th>Customer Service</th>
<th>Knowledge Identification</th>
<th>Knowledge Sharing</th>
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<th>Learning: Authoring</th>
<th>Learning Process</th>
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<tr>
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<td>SS</td>
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<td>ID^2</td>
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<td>SS</td>
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<td>PO</td>
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<td>PO</td>
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<td>PO</td>
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<tr>
<td>Learning: Authoring</td>
<td>PO^4</td>
<td>SS^5</td>
<td>SS</td>
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<td>Learning Process</td>
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<td>PO</td>
<td></td>
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<td>SS^6</td>
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</tr>
</tbody>
</table>

PO Process Overlap (includes SS and ID)
SS Shared Service (includes ID)
ID Information / Data Integration

[Source: Pawlowski, Bick, 2008]

* note: not subject to this analysis
Process Integration

- Requirements analysis
- Design
- Implementation
- Test
- Roll Out

Knowledge and competency requirements and needs

Problem descriptions and solution:
Context, sequences, experiences, actors

Scenario extraction:
sequences, contents

Scenario extraction:
sequences, contents

Sample Integration Processes:
- Knowledge gap analysis
- Staff development planning
- Experience sharing

Knowledge and competency requirements and needs

Knowledge identification

Knowledge development

Knowledge sharing

Knowledge maintenance and distribution
Reference Framework for the Description of Quality Approaches: ISO/IEC 19796-1

- **FA** Framework Analysis
- **CD** Conception/Design
- **DP** Development/Production
- **IM** Implementation
- **NA** Needs Analysis
- **EO** Evaluation/Optimization
- **LP** Learning Process/Realization
Process Integration: Knowledge Processes (Maier, 2004)
## Process Integration: ebXML

<table>
<thead>
<tr>
<th>Category</th>
<th>Sample Processes / Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement</td>
<td>Bid Submission, Contract Negotiation, Purchase Order Preparation, Receiving</td>
</tr>
<tr>
<td>Human resources</td>
<td>Hiring, Training, Payroll Management, Personnel Deployment</td>
</tr>
<tr>
<td>Transportation</td>
<td>Loading, Shipping, Packaging</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Product Development, Product Design, Assembly, Quality control</td>
</tr>
<tr>
<td>Marketing &amp; sales</td>
<td>Advertising Use &amp; Campaigning, Marketing Management, Sales Calling, Customer Credit Management</td>
</tr>
<tr>
<td>Customer service</td>
<td>After Sales Service, Warranty Construction</td>
</tr>
<tr>
<td>Financing</td>
<td>Loan Management, Stock Subscriptions and Sales, Dividend Policy</td>
</tr>
<tr>
<td>Administration</td>
<td>Accounting, Financial Reporting, Executive Management</td>
</tr>
</tbody>
</table>
# Process description

<table>
<thead>
<tr>
<th>ID</th>
<th>Category</th>
<th>Process</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Career</td>
<td>Planning</td>
<td>Course Planning</td>
<td>Individual course planning and course acquisition</td>
</tr>
</tbody>
</table>

## Sub-processes / Sub-aspects

- Competency assessment
- Manager consultation
- Content selection
- Selection: Inhouse or external training / face-to-face or E-Learning
- Provider negotiation

## Objective

- To find, perform and evaluate adequate courses to develop the competencies of staff members
- To select cost-efficient training providers
- To continuously monitor staffs’ performance
- Knowledge: To share knowledge on didactic success scenarios
- **Barrier: Lack of communication**
- **Barrier: Lack of data integration / willingness to share data**
- **Barrier: Culture related didactic differences**

## Method

- Competency gap analysis
- Agreement / negotiation talks with managers and staff
- Human oriented instrument: Knowledge fair on didactics

## Systems

- HR Management System (competency profiles and learner data)
- Gap Analysis tool (excel)
- Tech-oriented instrument: Course catalogue with discussion and rating options

## Actors

- Manager, staff member, HRCS team member, training providers, internal trainers
Process analysis and redesign

**Process Analysis**
- Analyzing processes for integration potentials
- Forecasting effects: Cost of integration, improved data handling, improved communication, …
- Identification of re-design candidates
- Negotiation and evaluation with all stakeholders

**Process Redesign and Implementation**
- Design of changed processes
- Updated process and data models
- Change Specifications: Specifying changes for actors and systems involved
- Cooperation process to ensure participation
Shared services’ and systems’ design

- Systems and service identification
  - Identification of integration candidates
  - Defining a new systems’ architecture
  - Potential levels: Systems or services
  - Defining integration type (service / data / user interface / portal, …)
  - Implementation plan

- Tools
  - JISC Services
  - Knowledge Services
JISC E-Learning Framework

<table>
<thead>
<tr>
<th>Sequencing</th>
<th>Assessment</th>
<th>Course Management</th>
<th>Personal Development</th>
<th>Course Validation</th>
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<tbody>
<tr>
<td>Activity Management</td>
<td>Marking</td>
<td>Resource List</td>
<td>ePortfolio</td>
<td>Quality Assurance</td>
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<td>Learning Flow</td>
<td>Grading</td>
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<td>Reporting</td>
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<tr>
<td>Tracking</td>
<td>Competency</td>
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<td>Curriculum</td>
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<table>
<thead>
<tr>
<th>Authentication</th>
<th>Resolver</th>
<th>Mapping</th>
<th>Whiteboard</th>
<th>Calendaring</th>
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<tbody>
<tr>
<td>Authorisation</td>
<td>Metadata Schema Registry</td>
<td>Format Conversion</td>
<td>Chat</td>
<td>Scheduling</td>
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<tr>
<td>DRM</td>
<td>Metadata Management</td>
<td>Filing</td>
<td>AV Conferencing</td>
<td>Group</td>
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<td>Role</td>
<td>Harvesting</td>
<td>Logging</td>
<td>Context</td>
<td>Member</td>
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<td>Rules</td>
<td>Search</td>
<td>Workflow</td>
<td>Presence</td>
<td>Person</td>
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<td>Federated Search</td>
<td>Service Registry</td>
<td>E-mail Management</td>
<td>User Preferences</td>
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<td>Archiving</td>
<td>Identifier</td>
<td>Messaging</td>
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<td>Content Management</td>
<td>Packaging</td>
<td>Forum</td>
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<td>Rating / Annotation</td>
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<td>Alert</td>
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<td></td>
<td>Terminology</td>
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</tbody>
</table>

Source:
http://www.jisc.ac.uk/uploaded_documents/elf-summary7-04.doc
Knowledge Services (Maier, 2004, Bick, 2008)

Knowledge Management Tasks (Maier, 2004)
- creation, building, anticipation or generation
- acquisition, appropriation or adoption
- identification, capture, articulation or extraction
- collection, gathering or accumulation
- (legally) securing
- conversion
- organization, linking and embedding
- formalization
- storage
- refinement or development
- distribution, diffusion, transfer or sharing
- presentation or formatting
- application, deploying or exploiting
- review, revision or evolution of knowledge

Source: (Maier, 2004)

IT-Tools
- Document Management
- E-Mail
- CSCW
- Search
- Data Mining
- List-Server
- Multi-Point-Videoconference
- News-Channel / News-Feed
- Application Sharing
- Social Software
- etc.

Human- & Structure-oriented Tools
- Mentoring
- Open Space
- Job Rotation, Job Enlargement
- Career Planning
- Team Development
- Simulation Games
- Future Search Conference
- etc.
Information and data integration

- Identification of integration potentials
  - Loose coupling vs. integration
- Data definition
  - Defining common data classes
  - Determining necessary extensions
- Choice of specifications
  - Choosing / considering standards or existing specifications as a basis
- Data mapping
  - Heterogeneous data descriptions
  - Mapping to define relations between the different entities
- Data synchronization
  - Data should be stored consistent and without redundancies
  - Examples: Single repository, data warehouse
  - For distributed environments: Defining synchronization mechanisms
- Tools
  - Learning Technology Standard Specifications
Process Integration

Knowledge Management

- Knowledge and competency requirements and needs
- Problem descriptions and solution: Context, sequences, experiences, actors
- Scenario extraction: sequences, contents
- Learning experiences
- Sample Integration Data:
  - Actor Profiles
  - Activity descriptions
  - Experience profile

Business Process

- Requirements analysis
- Design
- Implementation
- Test
- Roll Out

Knowledge Management

- Knowledge identification
- Knowledge development
- Knowledge sharing
- Knowledge maintenance and distribution
## Data Integration

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Specification</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenarios</td>
<td>DIN Didactical Object Model / IMS Learning Design</td>
<td>Both specifications can be recommended to describe scenarios as a basis for knowledge identification and learning environments. They cover aspects such as activities, context, and services which are used in many contexts: software development, problem or situation descriptions, learning scenarios.</td>
</tr>
<tr>
<td>Contents / documents</td>
<td>Learning Object Metadata</td>
<td>Learning Object Metadata cover a variety of aspects of contents (such as documents, learning modules, knowledge bits). Each can be described and related to each other.</td>
</tr>
<tr>
<td>Users</td>
<td>Learner Information Package</td>
<td>This specification describes a variety of aspects on user data. It covers all necessary basic data as well as specific data for the fields of knowledge management and learning.</td>
</tr>
<tr>
<td>Experiences</td>
<td>DIN Didactical Object Model</td>
<td>Experiences can be used in a variety of contexts, such as knowledge management. DIN DOM provides a format for structured description of experiences.</td>
</tr>
</tbody>
</table>

[Source: Pawlowski, Bick, 2008]
Evaluation and validation

- Cost-benefit analysis
- Validation of integration potentials
  - Improved communication
  - Process duration
  - Staff motivation
  - Staff involvement
- Analyzing strength and weaknesses
- Maturity analysis
- Planning the next integration cycle…
Evaluation and validation: KM Success Factors (Lehner, 2008)

Success at Business Level
- Cost reduction
- Quality improvements
- Time saving
- Increasing revenues

Success at KM Level
- Knowledge transfer
- Documentation of „best-practices“
- Reuse of Knowledge
- Internal Transparency
- Internal communication
- User Satisfaction
- Optimizing knowledge intensive processes
- Developing competences / Knowledge capital
- Establishing Communities

[Source: Lehner, F.: Knowledge Management Success Factors, Summer School, Jyväskylä, 2008.]
Summary

- Holistic planning of business, knowledge and learning processes
  - Focus: KM and E-Learning
  - Identifying similarities and common objectives

- Integration
  - Focus on reference models and standards to ease adaptation process
  - Process, service, data integration
  - Cooperation and participation
  - Tools for analysis and re-design

- Change and cooperation processes
So, how to integrate this into the overall KM design process?
Outlook

- New challenges and potentials
- Web 2.0 applications
- Internationalization of processes
- Open Source and Open Content
References and further readings


Contact Information

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