Global Knowledge Management

Process Integration of Business, Learning, and Knowledge Processes

Jan M. Pawlowski
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The Challenge
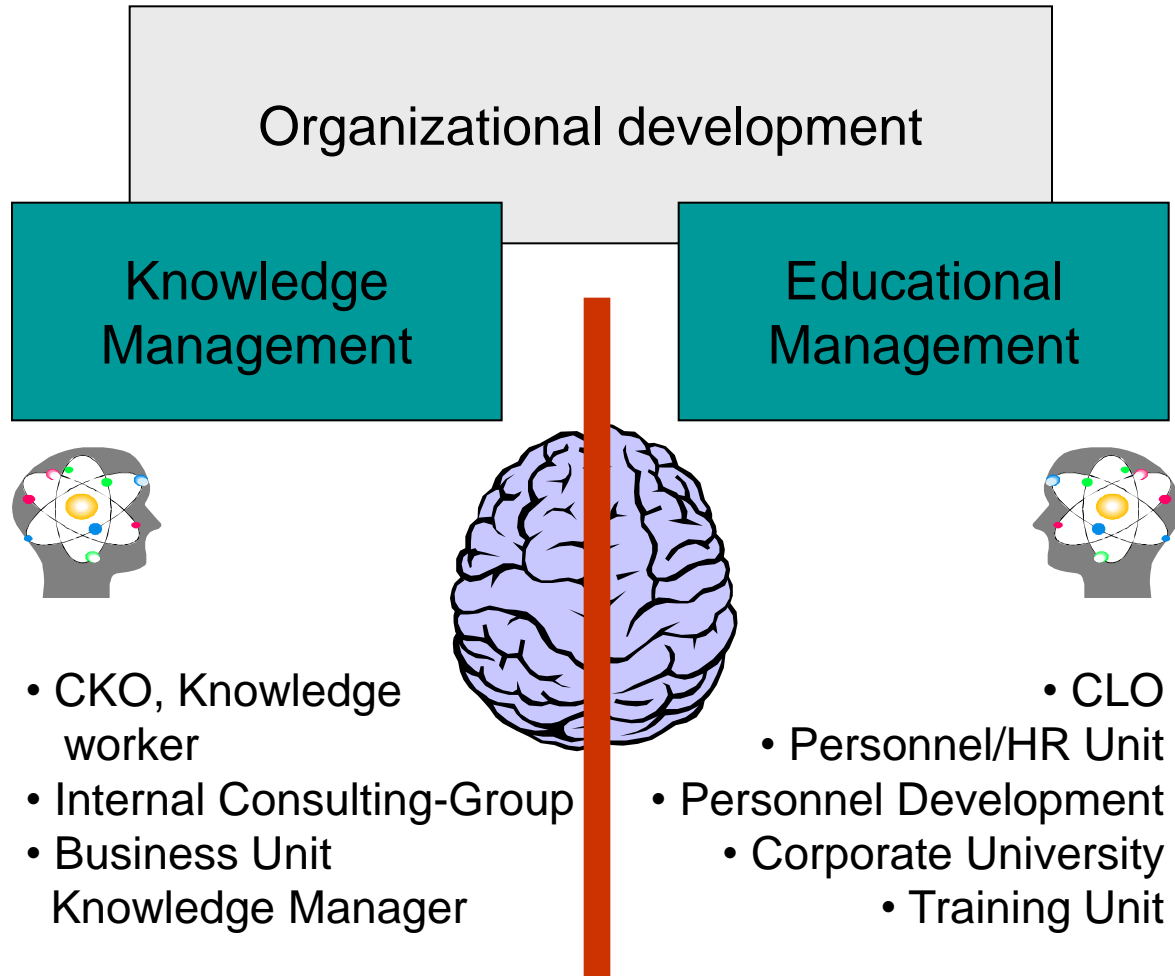
- Going one step further: Re-Design of Knowledge, Learning and Business Processes -> fostering synergies

- 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

Educational Management

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

- 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

happens in a work environment…

- 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

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
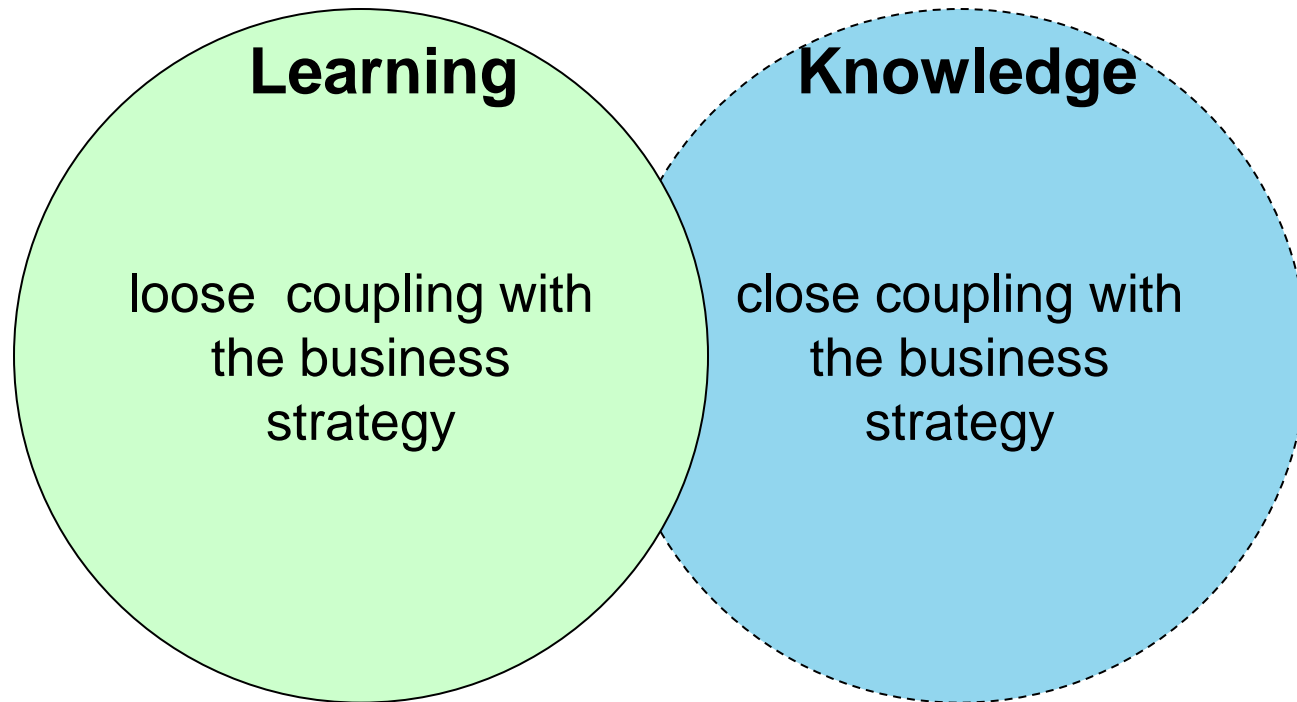
Strategy Integration

The relationship between the business strategy & eLearning and the business strategy & Knowledge Management ?

Learning

loose coupling with the business strategy
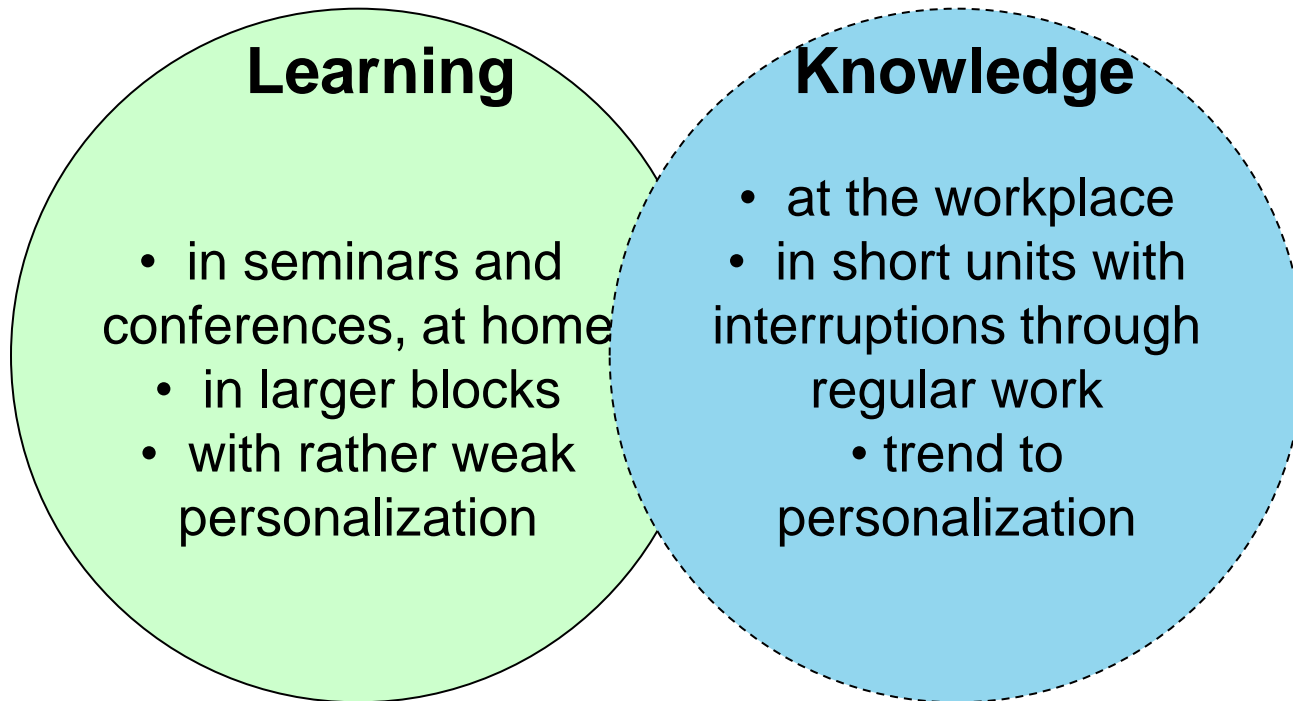
Knowledge

close coupling with the business strategy

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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

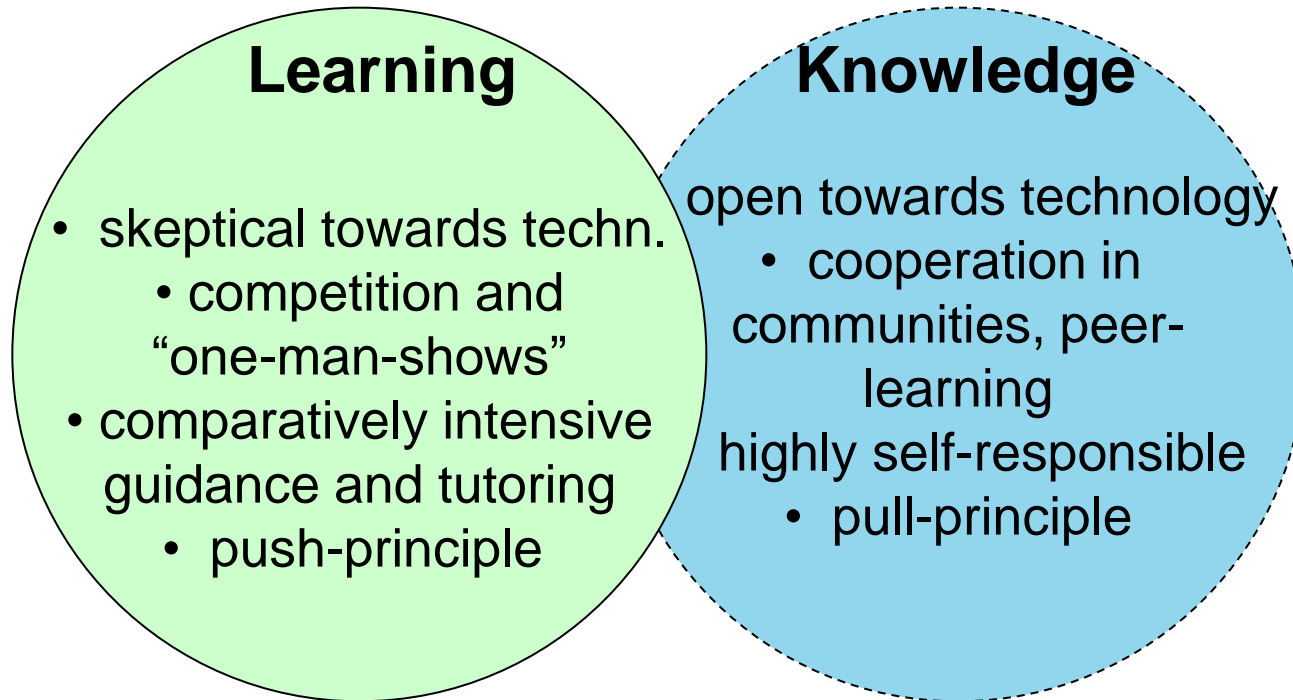- in seminars and conferences, at home
- in larger blocks
- with rather weak personalization

Knowledge

- at the workplace
- in short units with interruptions through regular work
- trend to personalization

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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

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Measurement of sucess

Learning

- institutionalized through assessments exams, certificates
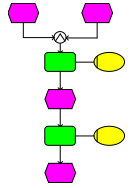
Knowledge

- rather weekly structured; often as part of regular employee assessment
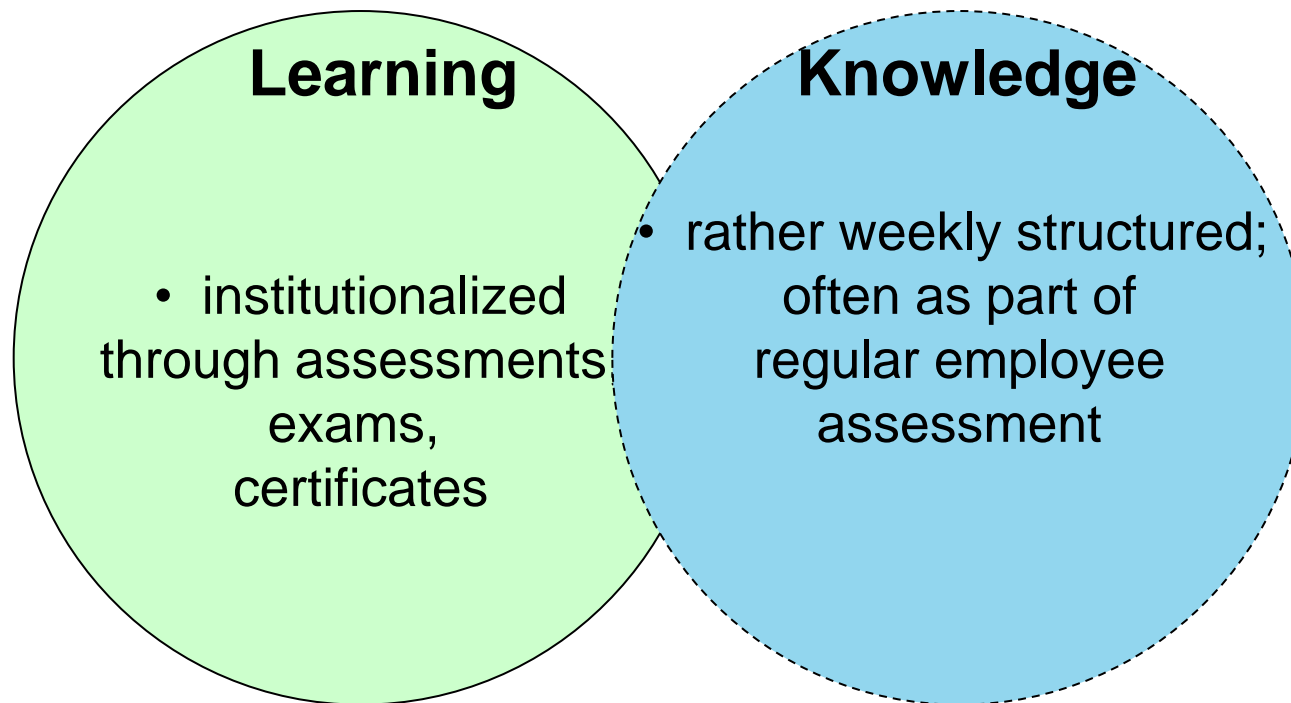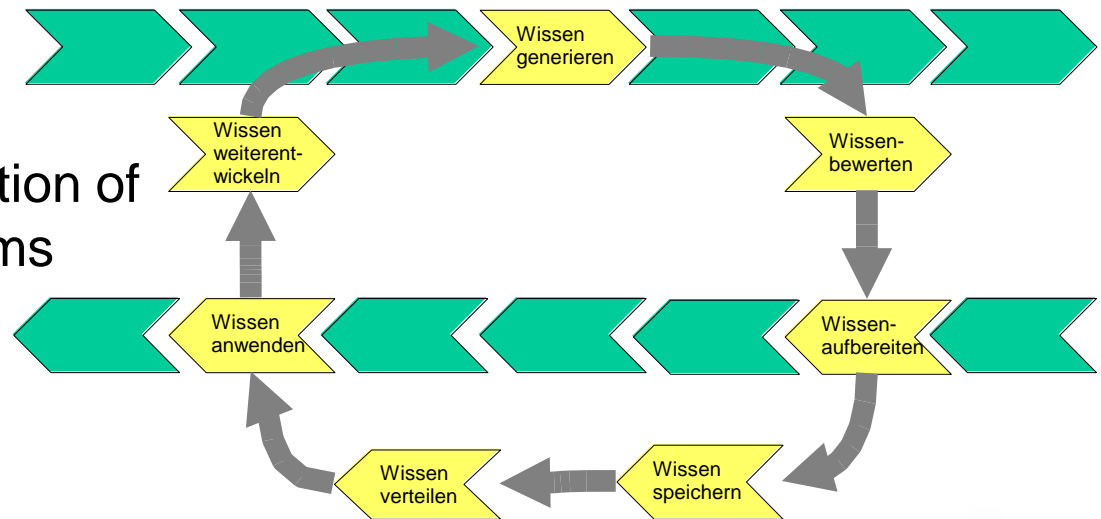
Back 2004

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

Wissen generieren

Wissen weiterent-wickeln

Wissen-bewerten

Step 3: Implementation of supporting IT systems

Wissen anwenden

Wissen-aufbereiten

Wissen verteilen

Wissen speichern

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?

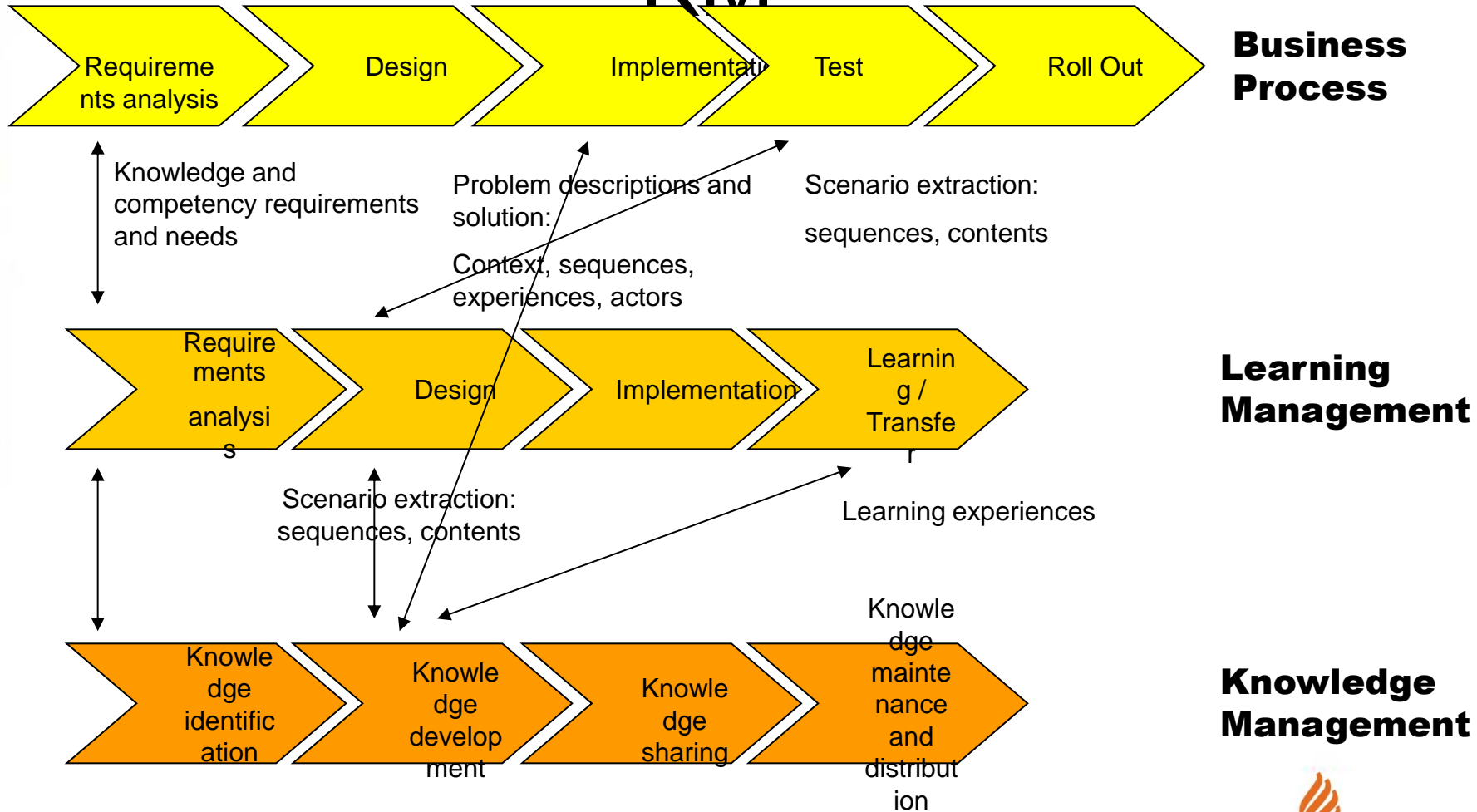- Which actors should be involved in cooperative processes?

Integration of E-Learning and KM

Business Process

| 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

Learning Management

| Requirements analysis | Design | Implementation | Learning / Transfer |

Scenario extraction:
sequences, contents

Learning experiences

Knowledge Management

| Knowledge identification | Knowledge development | Knowledge sharing | Knowledge maintenance and distribution |

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Conceptual Integration

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

Sample Integration Approaches

Objective	Method	Source
Integration of collaborative knowledge and learning processes	Systems development based on empirical surveys	Kienle, 2003
Re-Use of KM and E-Learning objects	Architecture / specifications	Mandl, Winkler, 2003, Back 2002.
Integration of strategy and processes	Conception and implementation of integrated processes	Sridharan & Kinshuk, 2002
Architecture	Taxonomy of contents	Wilkinson, 2002
Integration / interoperability	IMS Learning Design	Benmahamed, Ermine, Tchounikine, 2005
Competency development	Framework for competency mapping and development	Ley, Lindstaedt, Albert, 2005

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

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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

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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

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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

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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
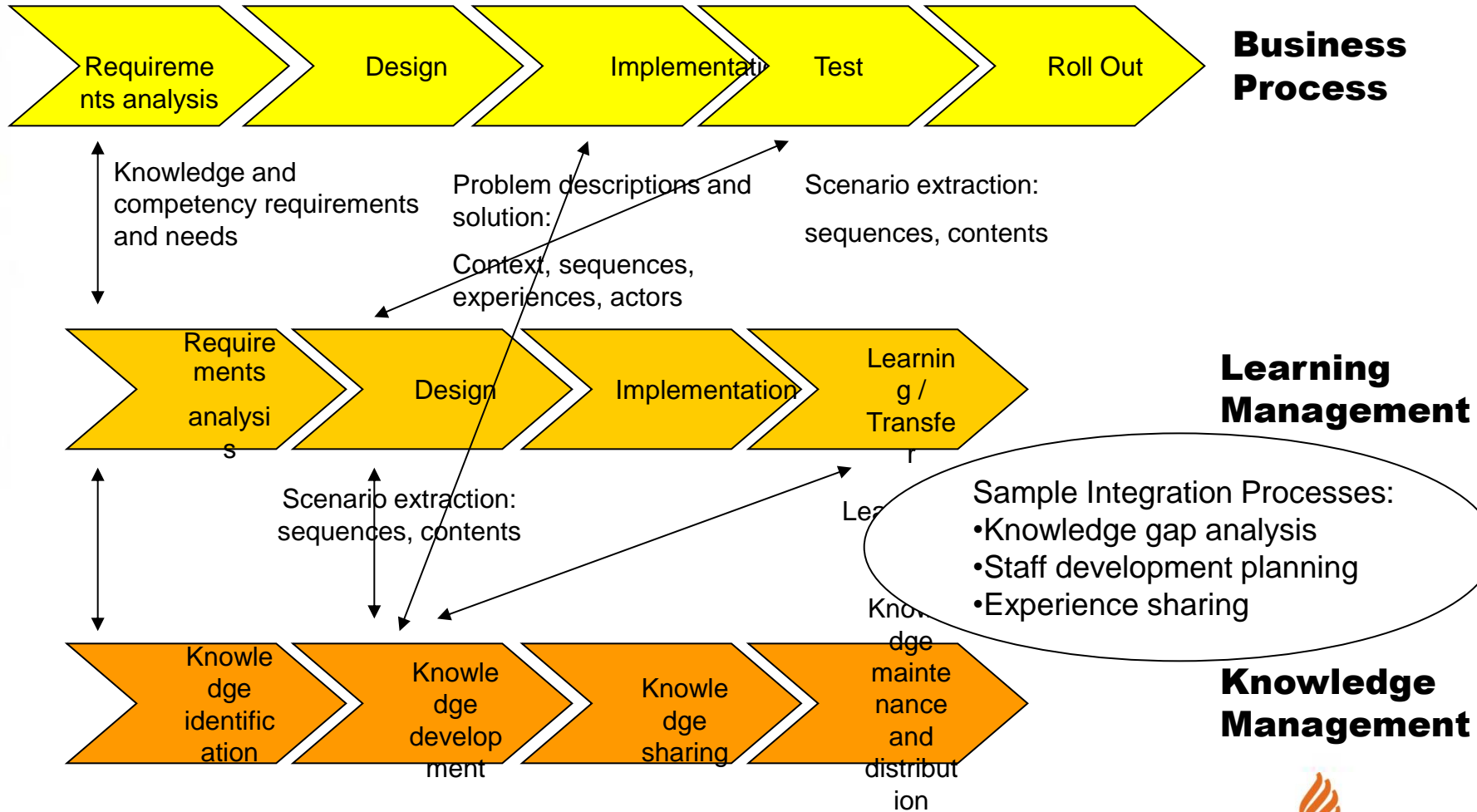 - Knowledge Management Processes
  - ebXML for Business Processes

Analysis Grid

	Manufacturing	Human Resources	Customer service	⋮	Knowledge Identification	Knowledge Sharing	⋮	Learning: Authoring	Learning Process
Manufacturing					PO[1]	SS		ID[2]	SS
Human Resources					ID[3]	SS		PO	SS
Customer Service					PO	PO		PO	PO
…									
Knowledge Identification	SS	SS	PO					PO	SS
Knowledge Sharing	PO	ID	PO					PO	SS
…									
Learning: Authoring		PO[4]	SS[5]		SS	SS			
Learning Process	ID	PO	PO		SS[6]	PO			
…									

PO Process Overlap (includes SS and ID)
SS Shared Service (includes ID)
ID Information / Data Integration
not subject to this analysis

[Source: Pawlowski, Bick, 2008]

Process Integration

Business Process
- 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

Learning Management
- Requirements analysis
- Design
- Implementation
- Learning / Transfer

Scenario extraction:
sequences, contents

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

Knowledge Management
- Knowledge identification
- Knowledge development
- Knowledge sharing
- Knowledge maintenance and distribution

Reference Framework for the Description of Quality Approaches – ISO/IEC 19796-1

CD
Conception/
Design

FA
Framework
Analysis

DP
Development/
Production

NA
Needs Analysis

IM
Implementation

EO
Evaluation/
Optimization

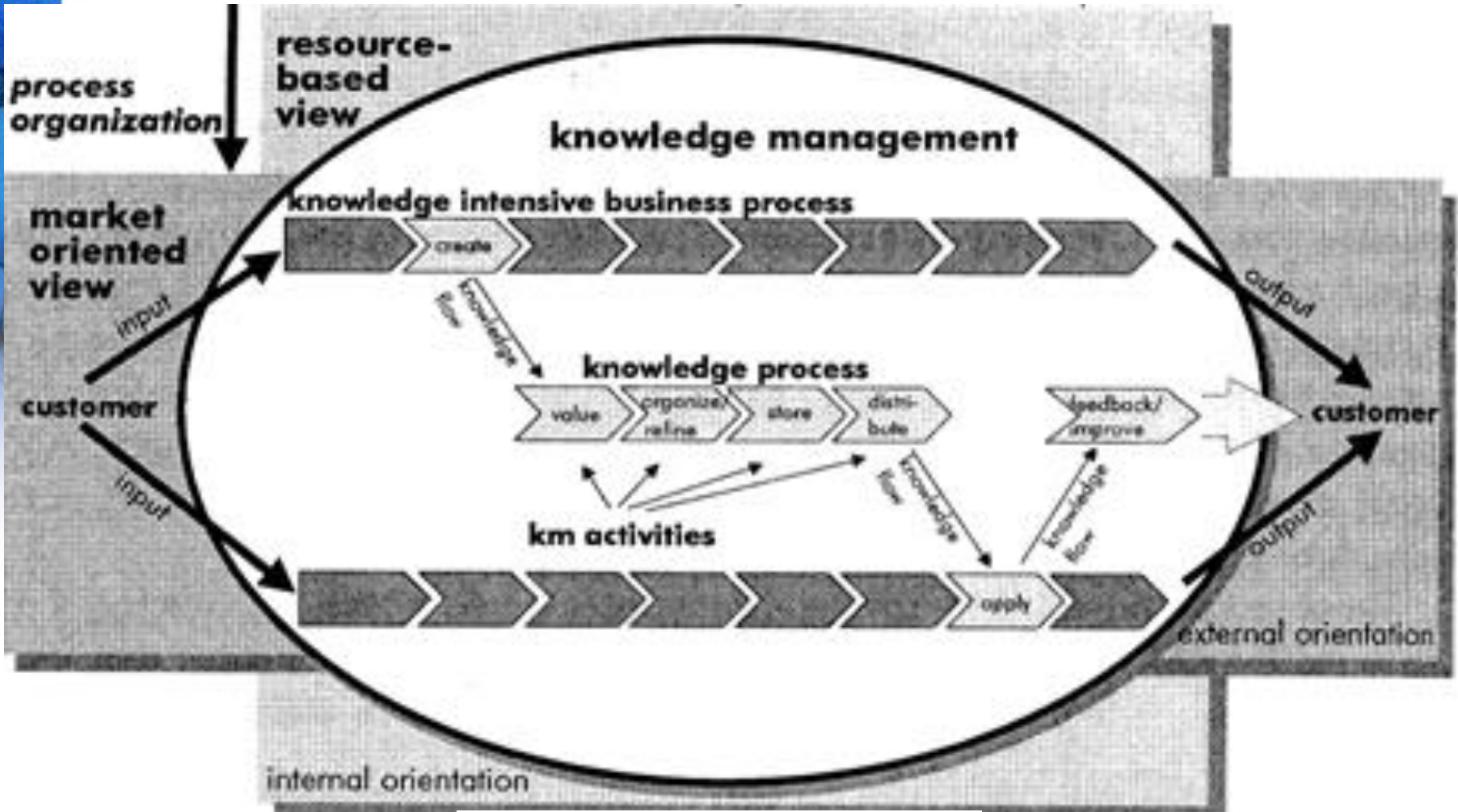**LP**
Learning
Process /
Realization

Process Integration: Knowledge Processes (Maier, 2004)

[Source: Maier,2004]

Process Integration: ebXML

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

Process description

ID	Category	Process	Description
	Career Planning	Course Planning	Individual course planning and course acquisition
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

Process Integration

Business Process

Requirements analysis	Design	Implementation	Test	Roll Out

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Problem descriptions and solution:

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Scenario extraction:

sequences, contents

Learning Management

Requirements analysis	Design	Implementation	Learning / Transfer

Scenario extraction: sequences, contents

Sample Integration Services:
- Enrollment
- Learner profile update
- Posting experiences
- Generating test data

Knowledge Management

Knowledge identification	Knowledge development	Knowledge sharing	Knowledge maintenance and distribution

JISC E-Learning Framework

Sequencing	Assessment	Course Management	Personal Development	Course Validation
Activity Management	Marking	Resource List	ePortfolio	Quality Assurance
Learning Flow	Grading			Reporting
Tracking	Competency			Curriculum
Activity Authoring				

Authentication	Resolver	Mapping	Whiteboard	Calendaring
Authorisation	Metadata Schema Registry	Format Conversion	Chat	Scheduling
DRM	Metadata Management	Filing	AV Conferencing	Group
Role	Harvesting	Logging	Context	Member
Rules	Search	Workflow	Presence	Person
	Federated Search	Service Registry	E-mail Management	User Preferences
	Archiving	Identifier	Messaging	
	Content Management	Packaging	Forum	
	Rating / Annotation		Alert	
	Terminology			

Source:
http://www.jisc.ac.uk/uploaded_documents/elf-summary7-04.doc

Knowledge Services (Maier, 2004, Bick, 2008)

IT-Tools

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

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)

Human- & Structure-oriented Tools

- Mentoring
- Open Space
- Job Rotation, Job Enlargement
- Career Planning
- Team Development
- Simulation Games
- Future Search Conference
- etc.

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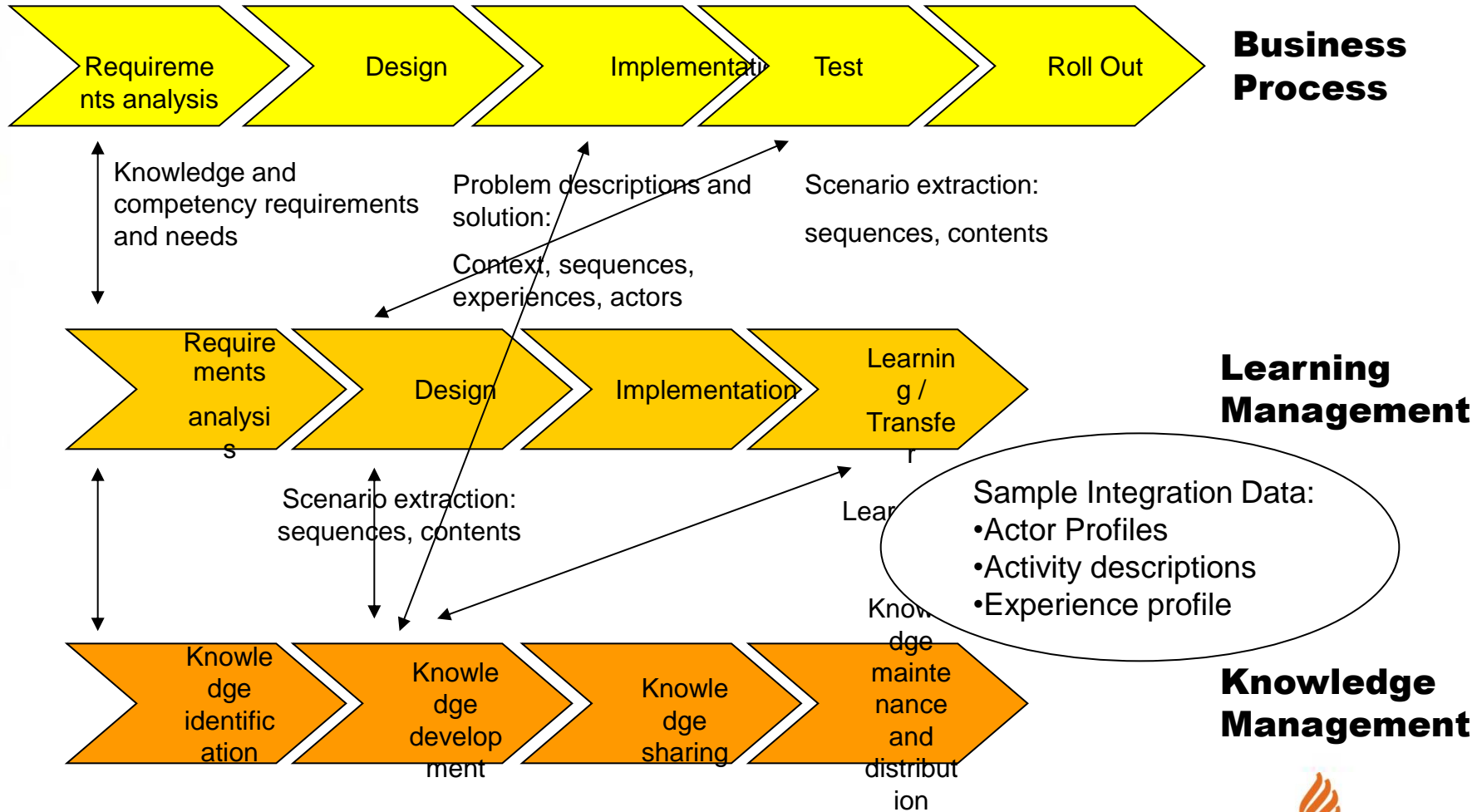# Information and data integration

- **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

Business Process: 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

Learning Management: Requirements analysis → Design → Implementation → Learning / Transfer

Scenario extraction: sequences, contents

Sample Integration Data:
- Actor Profiles
- Activity descriptions
- Experience profile

Knowledge Management: Knowledge identification → Knowledge development → Knowledge sharing → Knowledge maintenance and distribution

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Data Integration

Aspect	Specification	Explanation
Scenarios	DIN Didactical Object Model / IMS Learning Design	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.
Contents / documents	Learning Object Metadata	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.
Users	Learner Information Package	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.
Experiences	DIN Didactical Object Model	Experiences can be used in a variety of contexts, such as knowledge management. DIN DOM provides a format for structured description of experiences.

[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)
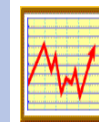
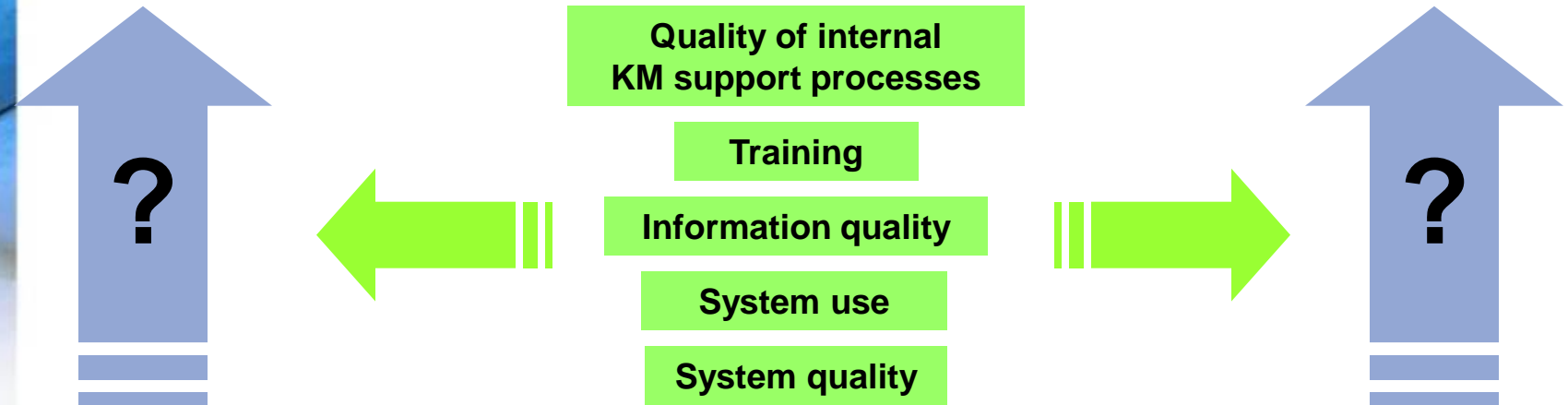## Success at Business Level

- Cost reduction
- Quality improvements
- Time saving
- increasing revenues

? ← → **?**

Quality of internal KM support processes

Training

Information quality

System use

System quality

Success at KM Level

- Knowledge-transfer
- Documentation of „best-practices"
- Reuse of Knowledge
- Internal Transparency
- Internal communication
- User Satisfaction
- Enterprise culture
- Optimizing knowledge intensive processes
- Developing competences / Knowledge capital
- establishing Communities

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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**

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- 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

- Gereffi, G., Humphrey, J., Sturgeon, T. (2005): The governance of global value chains, Review of International Political Economy, 12:1, 78-104

- Faber, E., P. Ballon, H. Bouwman, T. Haaker, O. Rietkerk & M. Steen (2003) Designing business models for mobile ICT services. Proc of the workshop on concepts, metrics & visualization, 6th Bled Electronic Commerce Conference eTransformation, Bled, Slovenia, June 9 -11, 2003.

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Contact Information

Prof. Dr. Jan M. Pawlowski

- jan.pawlowski@jyu.fi
- Skype: jan_m_pawlowski

- Office: Room 514.2
- Telephone +358 14 260 2596
- http://users.jyu.fi/~japawlow