



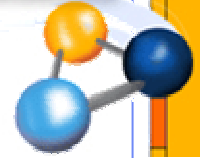


Sharing, transmitting storing information and knowledge in Higher Education Establishments

PhD Seminar
December 2005

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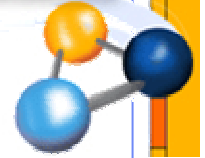
Outline

- Background
- Research Hypothesis
- Research Methodology
- Observational & Historical Studies
- Concluding remarks



Background

- Continuous organizational changes may allow organizations to maintain their relationships with a turbulent and complex environment
- Characterization of factors rendering an organization capable of getting and maintaining its effectiveness through organizational changes remains an issue with arguments
- Some scholars have paid attention to the capability of large organizations / conglomerates to learn and continue creation of new knowledge (Nonaka, Drucker, Davenport, Liebowitz etc)
 - as condition for any organizational policy advocating continuous changes in order to face the growing complexity of the marketplace



Background

- Knowledge may be regarded as a function of beliefs
- Change of belief is assumed to cause creation / adoption or adaptation, of new knowledge
- Flow of knowledge may relate to articulation and disarticulation of such belief
- Flow of knowledge amongst peers may need continuous monitoring and facilitation at different stages of the diffusion of the knowledge of domain
- Language helps representing objects and their corresponding characteristics.
 - Abounding with specialist terms, that some may be emergent
- Trace of knowledge is contained into Documents (2 categories)



Background

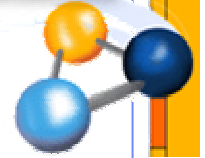
- Higher institutions: Academic Knowledge represented by Academic Credentials
- Faculty beliefs and competences are shared or transferred to students during its study
- $\Sigma(\text{Acquired Credentials}) \rightarrow \text{Diplomas}$
 - Proof of participation
 - Academic merit attestation -> Eligibility to certain job
 - Position: Confer some advantages on some individuals
 - Assist social mobility
 - Open doors (further study, Job opportunity)
 - Possession of certain skills and knowledge

Margison (2004)



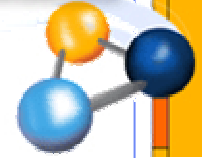
Background

- Credential hinted by Diploma is today very important.
- In a Context of globalization: Circulation
 - Identification
 - Authentication
 - Validation (Legitimacy and Acceptability Brown 2005)
- Fighting credential fraud
- Very difficult / Expensive process, no real existing methods (Today).
 - Europe Bologna Declaration of June 1999
 - Mobility, Standardization, recognition
 - No Worldwide application

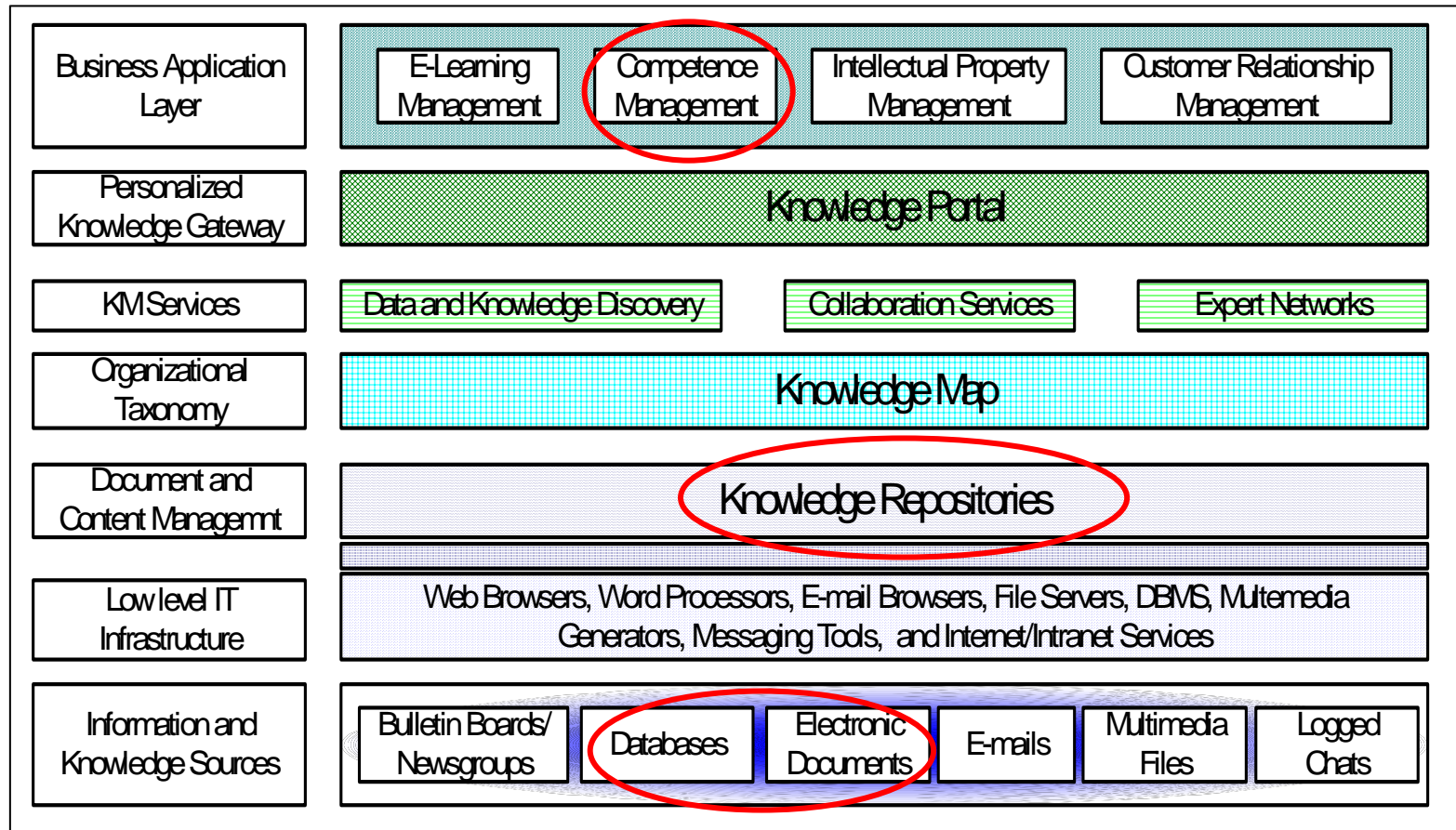


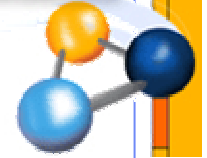
Background

- **Academic Knowledge:** The sum or range of what has been perceived, discovered, or learned *in Higher academic institution*
- **Academic Credentials:** Tacit and explicit knowledge gained/offered, granted by consensus from academic world
- Can we **automate** the Validation/Evaluation of **Academic Credentials** within a multitude of environments?
- Perception of this academic knowledge
Academic World (Internal) - Professional World (External)
- **Validation: cybernetic approach** (Argyris & Schon 1978)
 - Single loop: From academic world (International Diversity)
 - Double loop: Feedback and justification from domain expert (professional world)

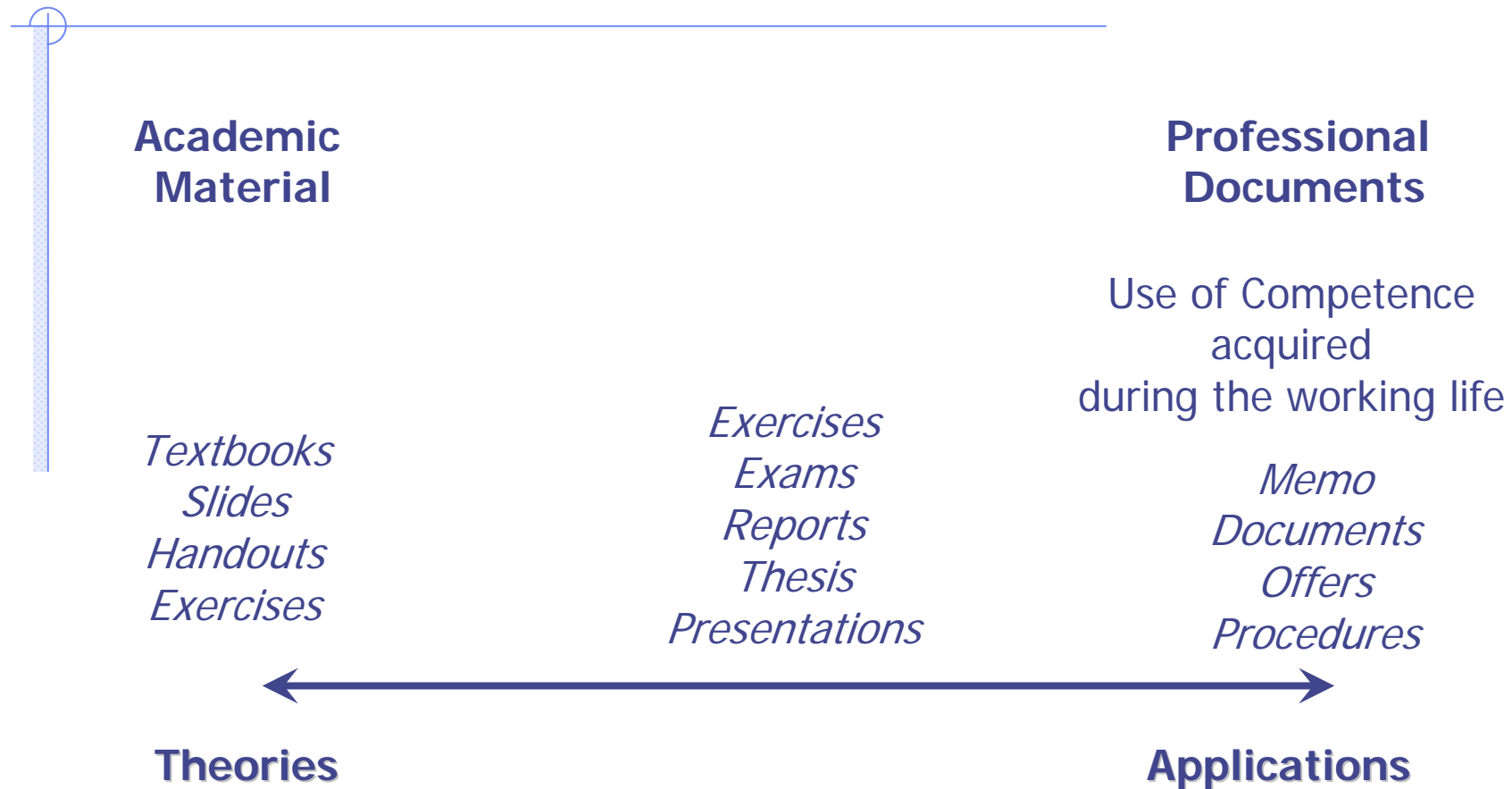


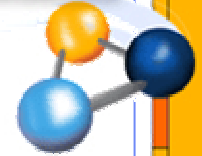
Knowledge Management Architecture in organization



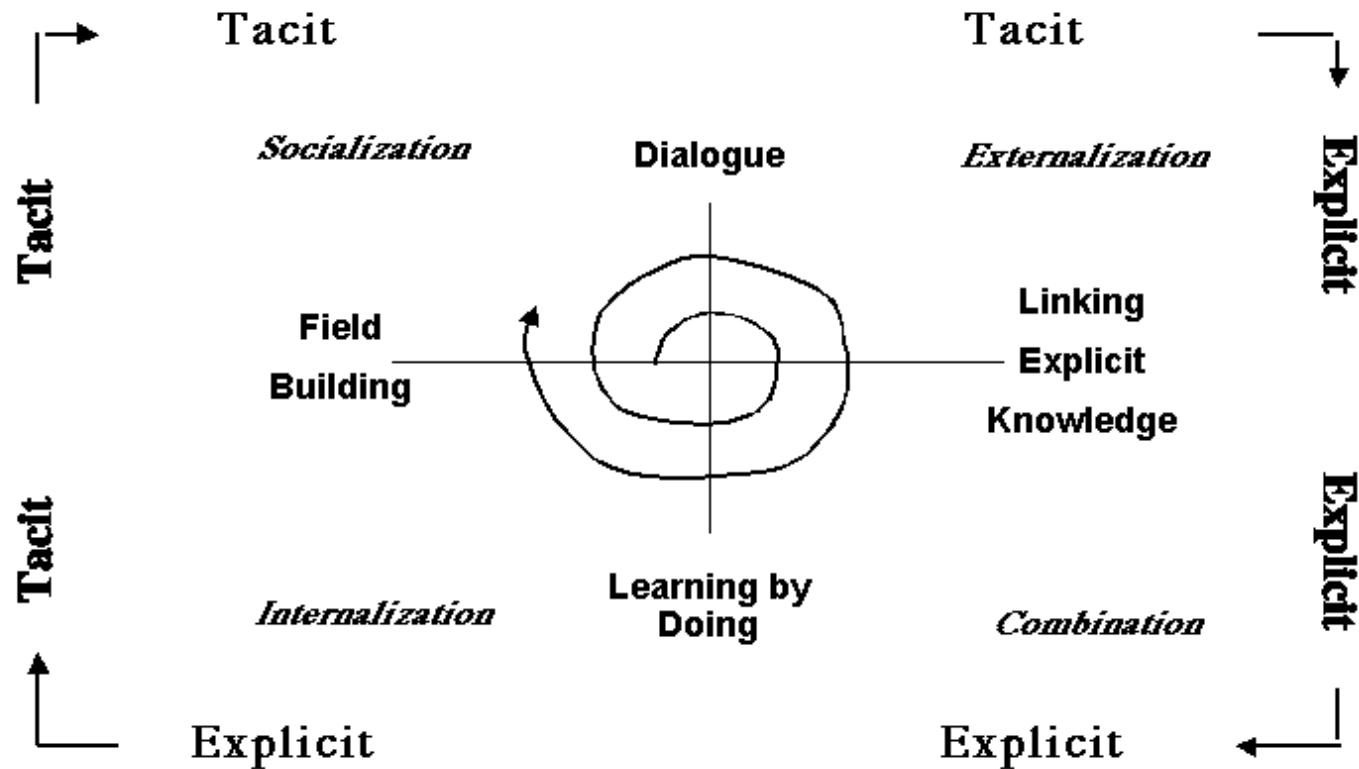


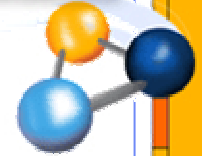
Knowledge repository Spectrum coverage



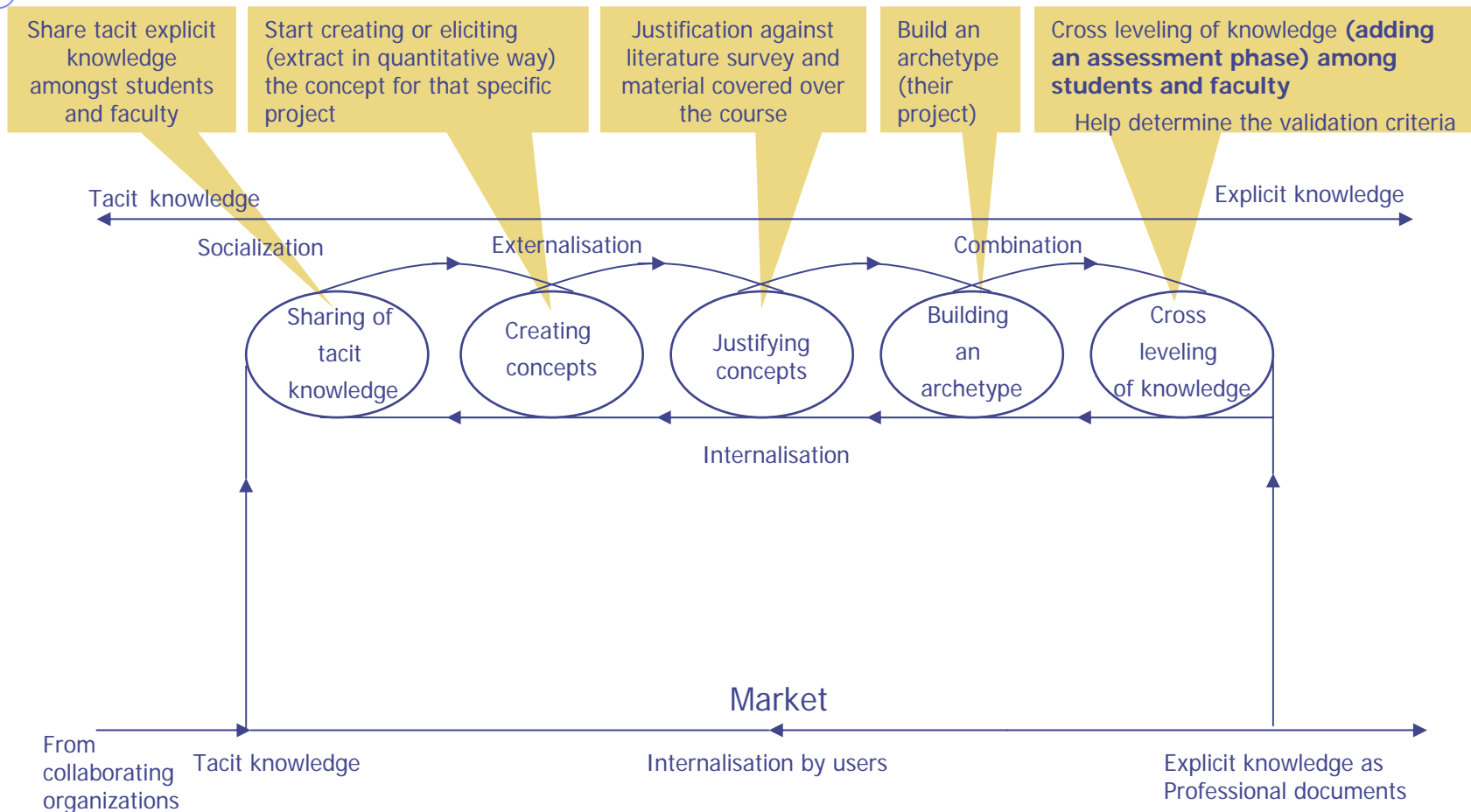


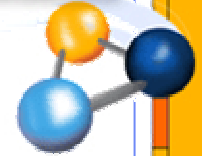
Knowledge Conversion model



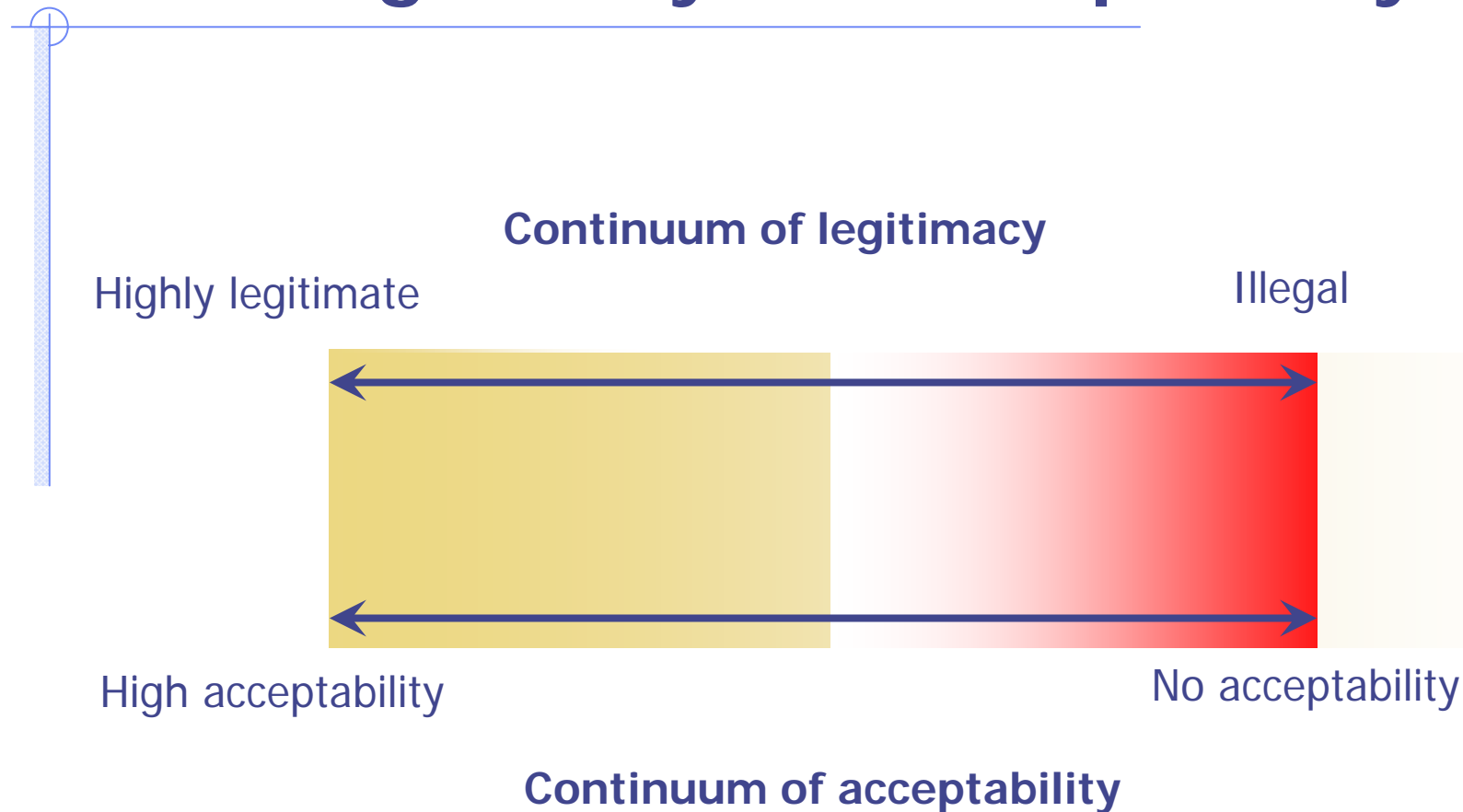


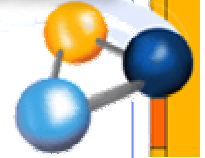
Five phase model of the organization knowledge creation process





The Continuum models of Legitimacy and Acceptability





Research

Motivation/problem

- Investigating applicability of knowledge conversion model in the Field of Higher Education
- How can we help acceptability and legitimacy translations.
- Diffusion of knowledge in Higher Education establishments
- Coverage and feasibility of the domain selected: What are the specialized domains bounded by a given diploma
- Which standard, *academic knowledge* acquired by an individual can be benchmarked against?



Research

Motivation/problem

- Attempt to identify through comparative studies how Academic documents (**science: theories, assumptions, fundamental knowledge: i.e. higher education institution**) feed onto commercial documents (**business: models, practices, applied knowledge: i.e. spin-off of higher education institution**)
- Can we use corpus linguistic methodology (Quirk, 1985) to facilitate the validation process of specialist Competences
- Attempt to relate Job offers and students academic credential language, by and/or across specialist domains.
- Collection of data and relevance of their representation (Individual and Temporal)



Research

Justification/Objectives

- Facilitate International nature of a recruitment process (Globalization)
- Try to reduce Fraud
 - Increase Recognition of Academic Credentials (+authentication)
 - Increase acceptability for a given category of Diploma
- Giving added value to the candidate academic background
- To find a way to ease the process of managing competences (HR)
- Externalize relationship between academic offering and business recruitment



Research Hypothesis

“Can we automate the validation of Academic Credentials?”

- Academic credential is a constantly evolving knowledge
- We have used a model for the Knowledge conversion from academic to business. (knowledge conversion model, Nonaka et al 1995)
 - Flow and adaptation of specialist knowledge from academic documents onto commercial documents
 - Understand and identify how academic knowledge is converted into knowledge used in a professional environment
- Extend Nonaka *et als* (1995) organisational knowledge creation theories (*knowledge conversion model*) into the area of Higher Education institution
- Need for Externalization of the **tacit** relationship between academic and professional world.
- Single/double loop approach of the AK Validation



Research Methodology

Grounded theory (finite setting) (Glaser and Strauss 1967/80)

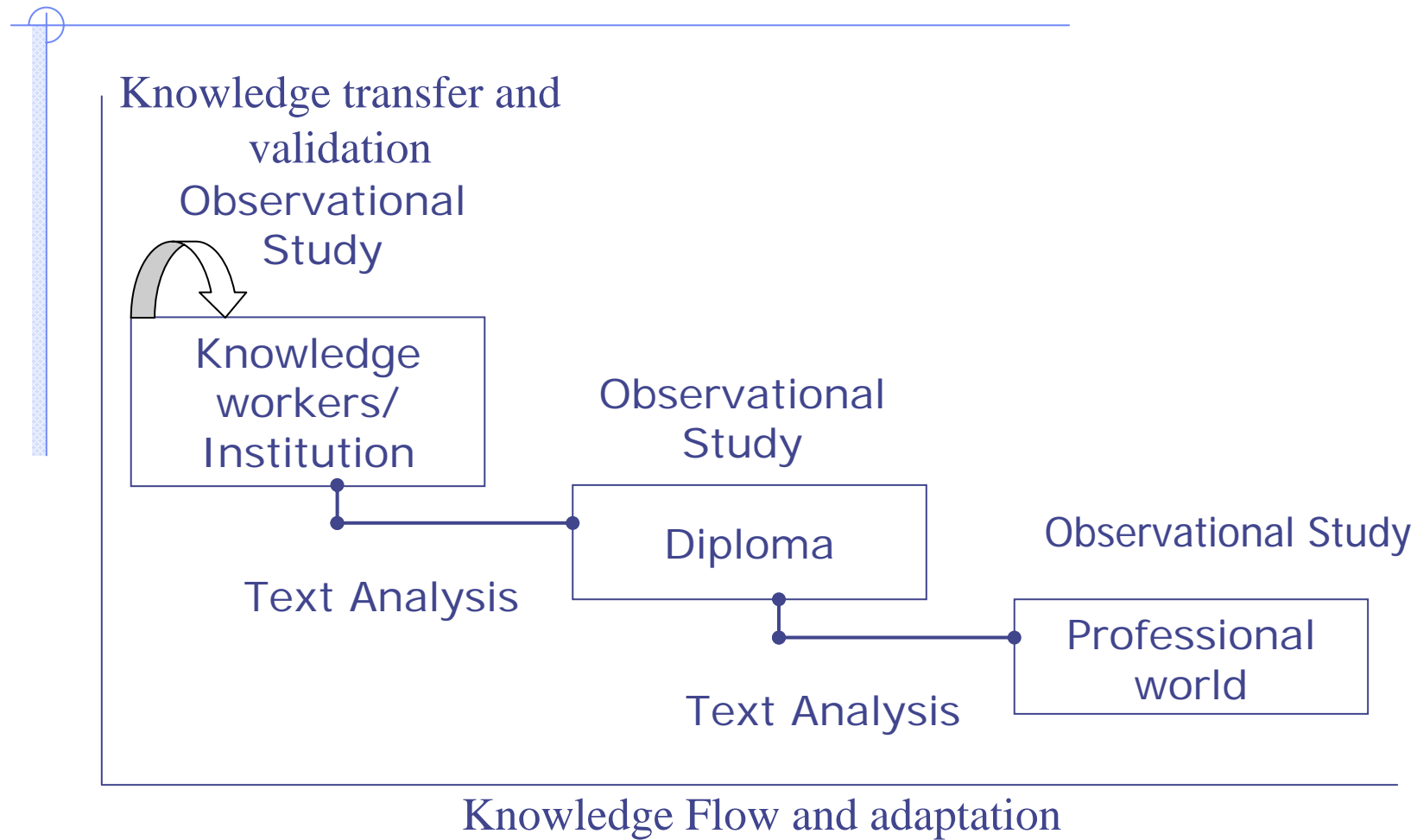
- Theory is derived inductively from observation
- According to a specific research procedure
- It comes into being in an environment of qualitative field research
- Much empirical research starts with a set of hypotheses and tests them against empirical data
- Grounded theories are developed incrementally from empirical observation
- A candidate concept or proposition is discovered and integrated in the emergent theory

Case Methodology (non-finite setting)

- Yin (1994) identified five components of research design that are important for case studies:
 - study's questions
 - Its propositions, if any
 - Its unit (s) of analysis
 - The logic linking the data to the propositions
 - The criteria for interpreting the findings



Methodology AK diffusion

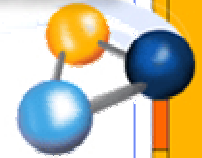




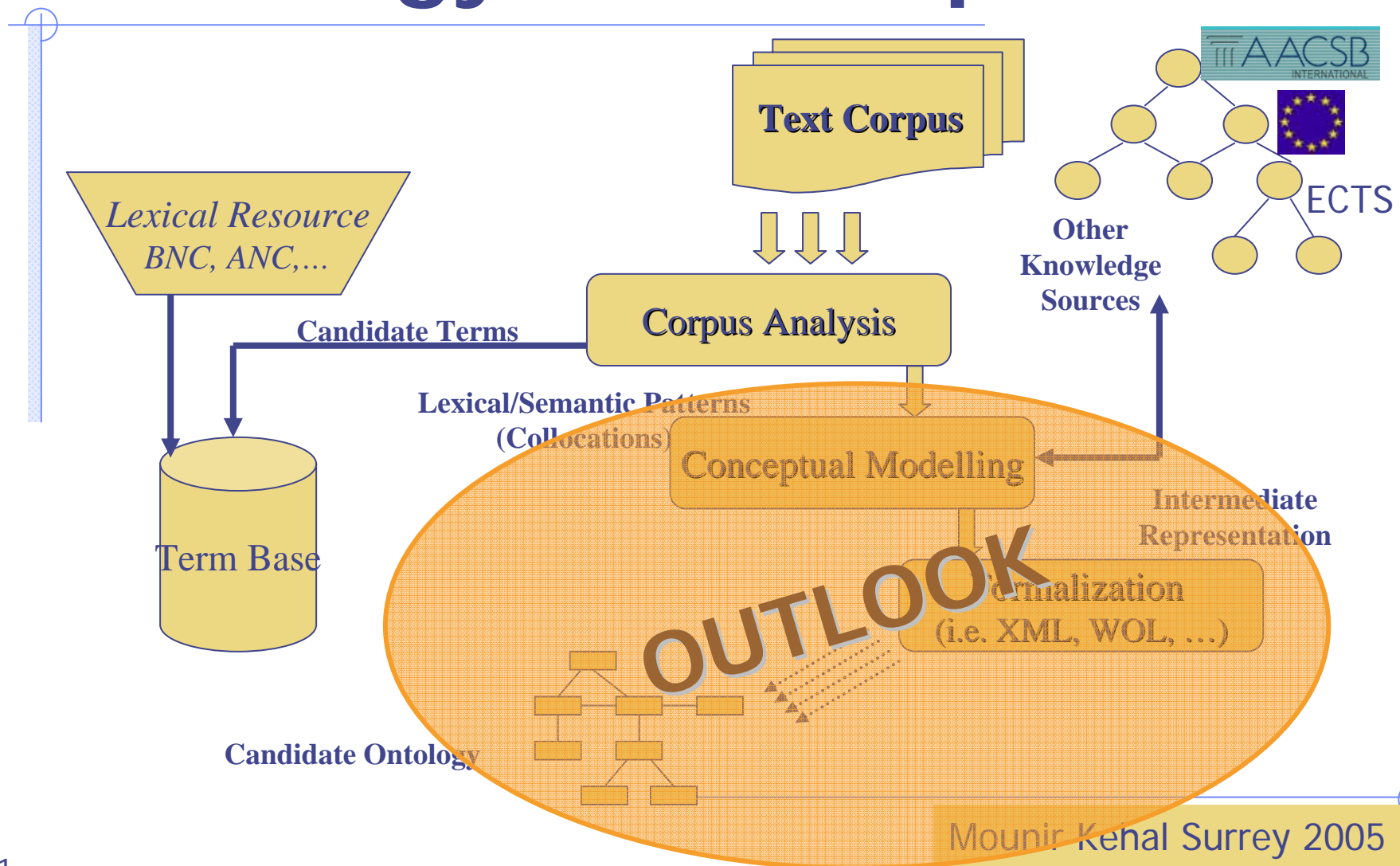
Methodology

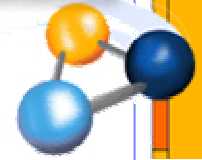
AK diffusion

Agent A	Agent B	Elements of K-Repository	Technique
Person	Person	Opinion, practice, know-how, lecture, discussion, dialogue	Observational study
Person	Organization	PhD Dissertation, Research Publications, technical reports...	Text Analysis
Organization	Organization	Specialist documents (i.e. technical documents, academic document)	Text Analysis
Organization	Worldwide	Specialist documents (i.e. technical documents, technology-specific documents, Diploma)	Text Analysis + Observational Study



Ontology creation process





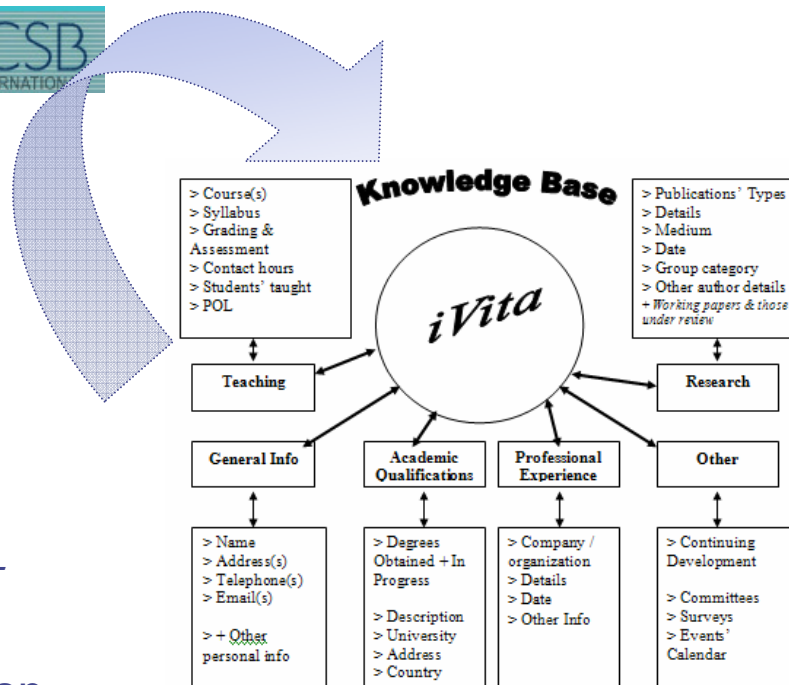
Observational Study

A cybernetic approach (Shon & Argyris 1978) of academic credential validation
Scope of the study: IUM knowledge



ECTS
P.L.A.R.
I.C.E.
ACCEPT

Single loop
Validation





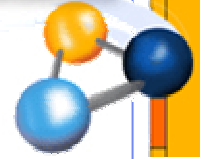
Observational Study

Single Loop Validation: acceptability of a Diploma European tools

- Lisbon Recognition Convention 1997
 - entry to higher education
 - study period taken in other countries
 - recognition of higher education credential

- Diploma supplement provides additional information (holder, level, content, result achieved ...)

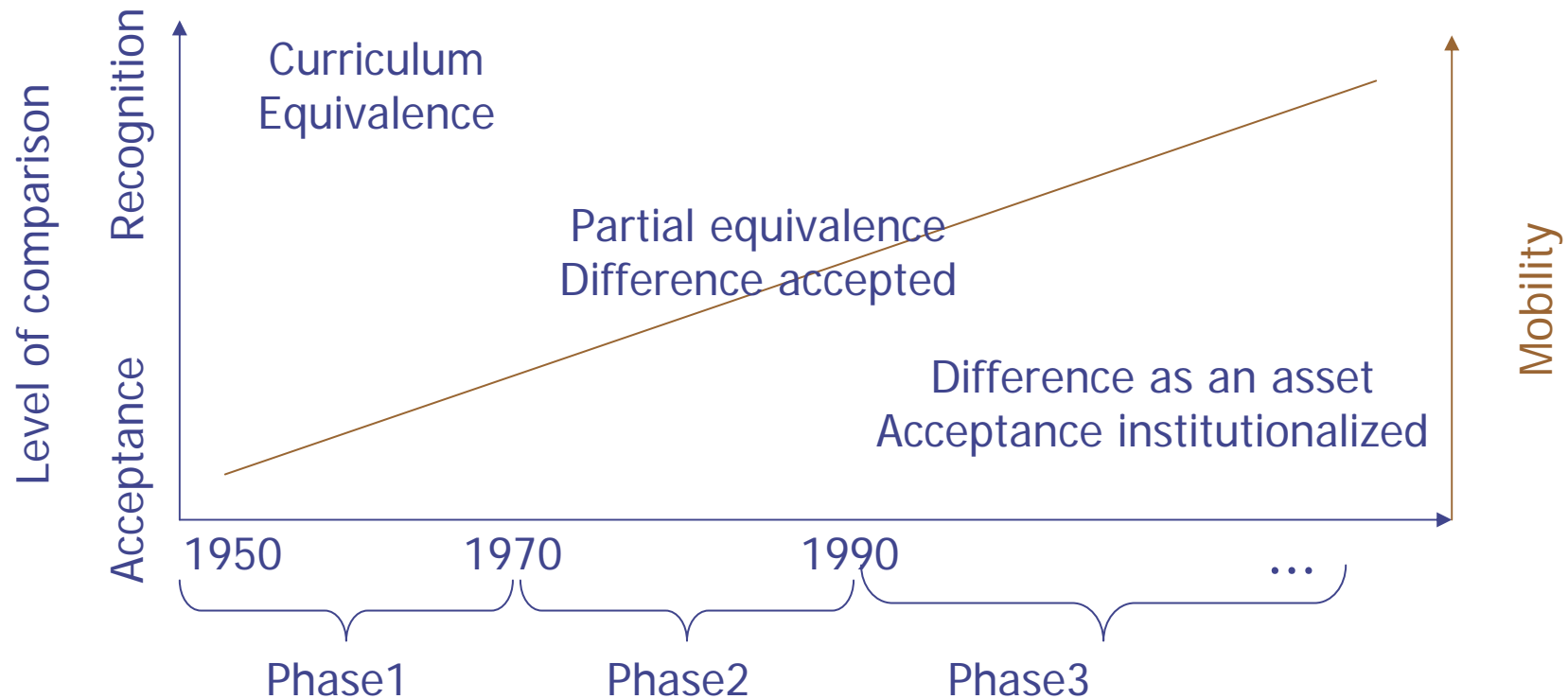
- ECTS (89) European standardization to help students traveling through Europe during its study.

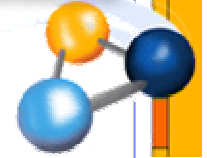


Observational Study

Single Loop Validation: Netherlands Example

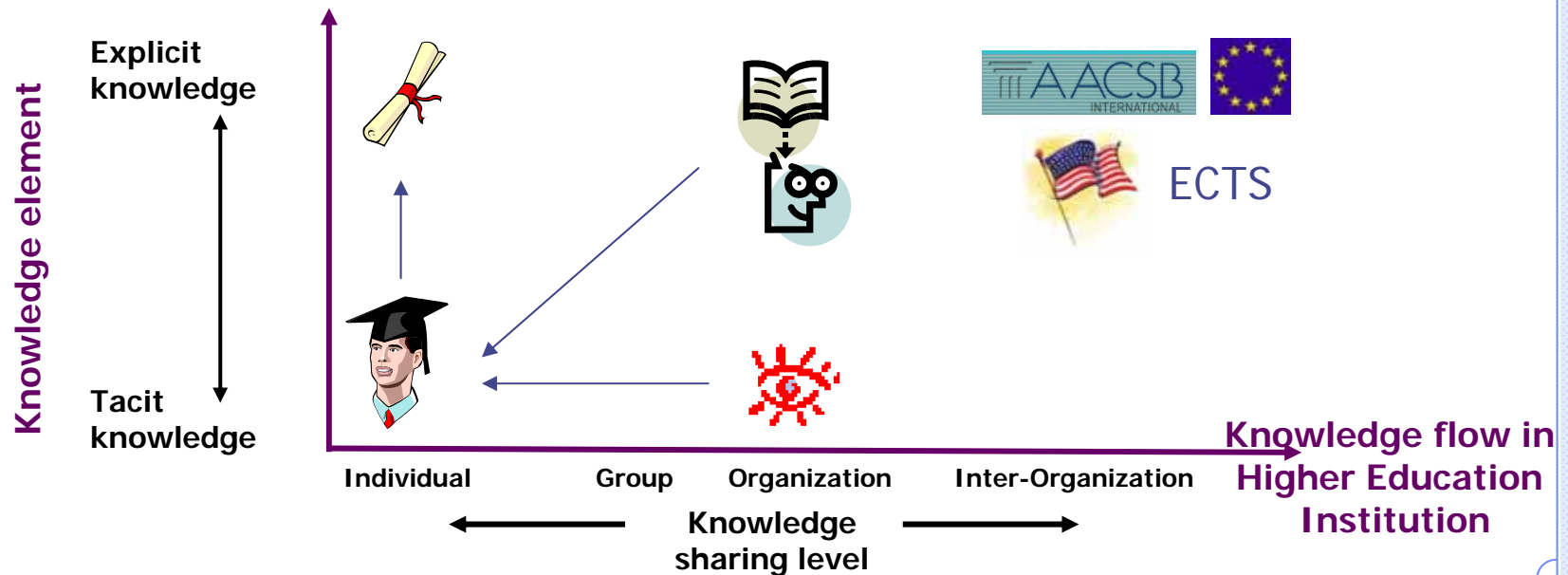
- I.C.E. (Netherlands) Colo – IMG - Nuffic

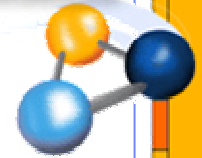




Single Loop Learning

“Can we automate the validation of Academic Credentials (at an individual level) within a multitude of environments?”





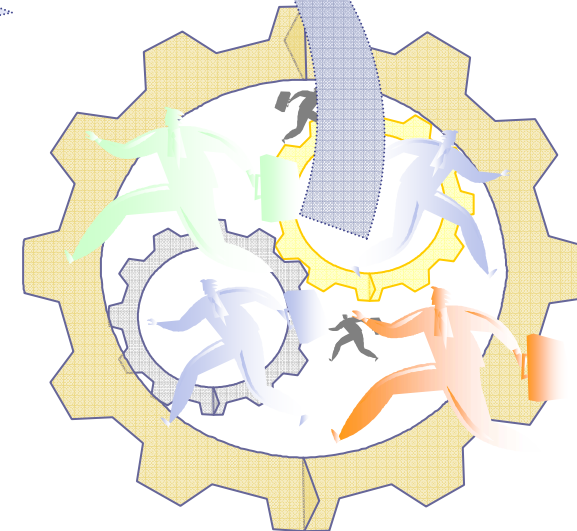
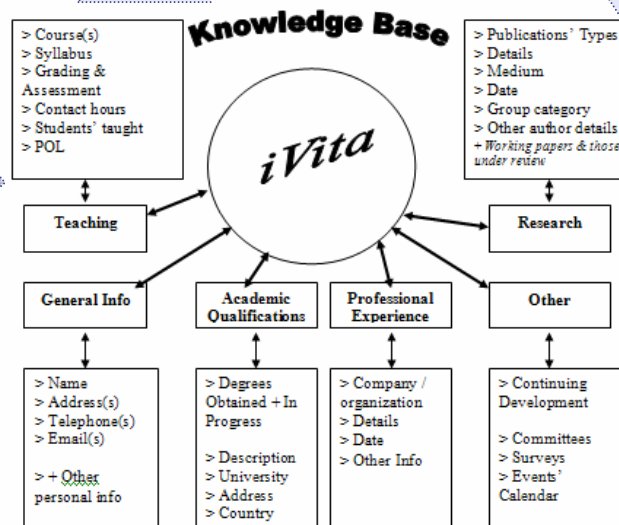
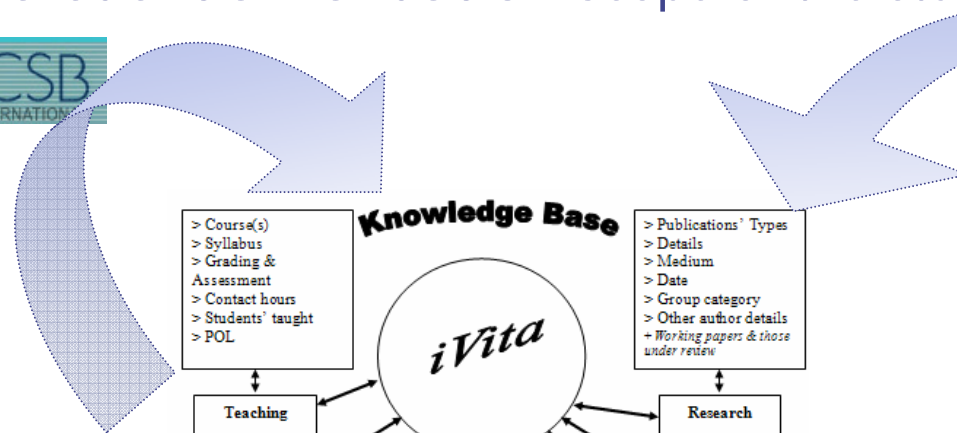
Observational Study

A cybernetic approach (Shon & Argyris 1978) of academic credential validation
Scope of the study: IUM knowledge

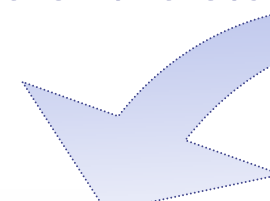


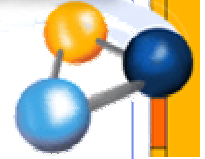
ECTS
P.L.A.R.
I.C.E.
A.C.C.E.P.T.

Single loop
Validation



Double loop
Validation

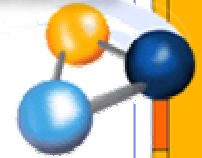




Observational Study

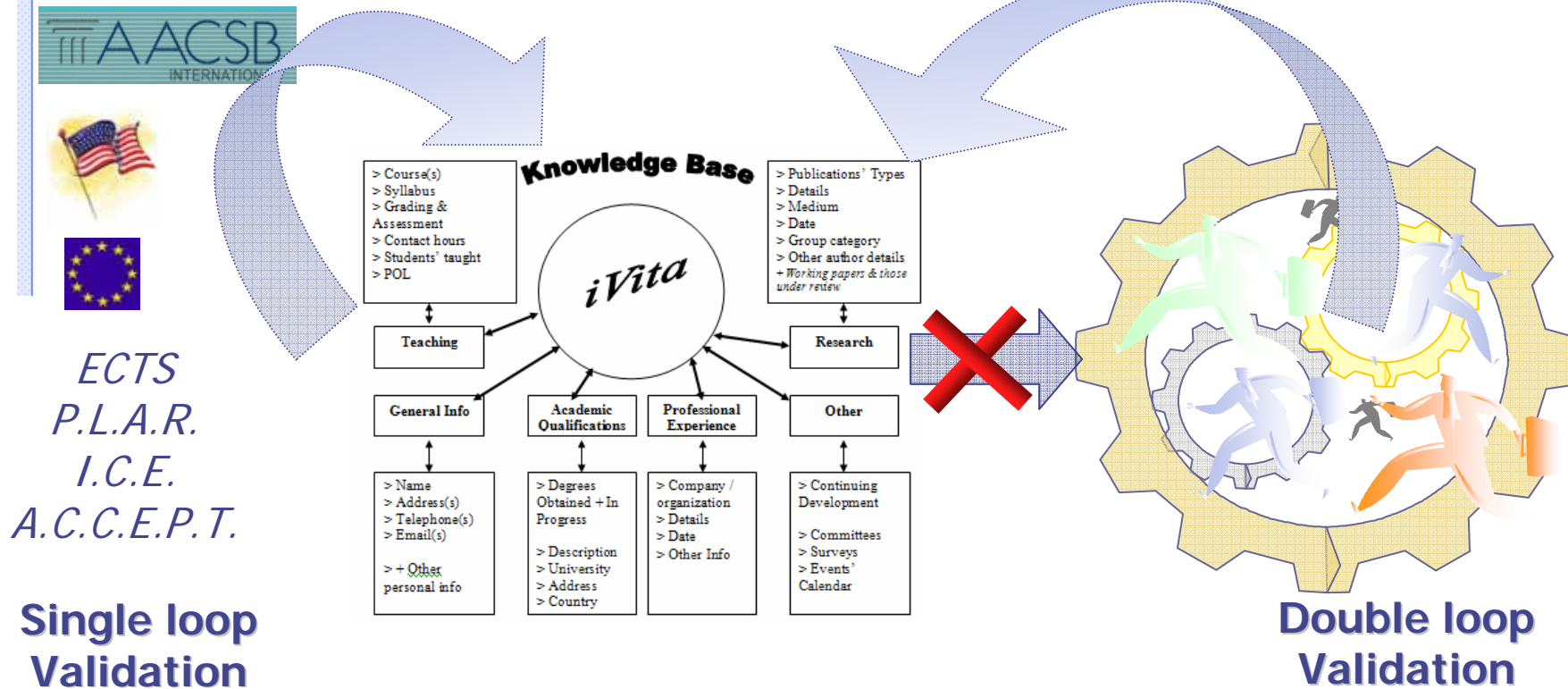
Double Loop Validation IUM

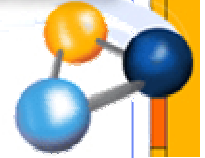
- Alumni questionnaire
- Employer satisfaction survey
- Faculty body composed of professionals
- Inviting external lecturer
- Hosting Seminar and conference



Observational Study

A cybernetic approach (Shon & Argyris 1978) of academic credential validation
Scope of the study: IUM knowledge



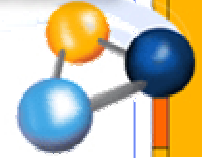


Observational Study

- **Human Resource Departments**
 - Diploma validity assessment methods if any
 - Interest in the content of the study

- **External parameter**
 - Private or public company
 - The number of employee of the company
 - The country of the company
 - The level of the diploma undergraduate or graduate

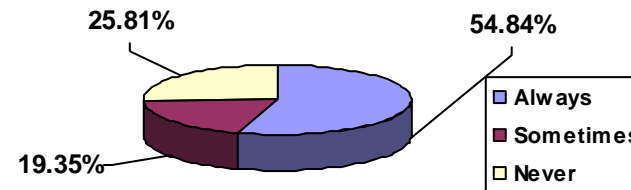
- **Particularity**
 - 100% of the answers came from the private sector
 - Almost all respondents were from SME (from 2 to 1000 persons)
 - 96% in Monaco



Findings

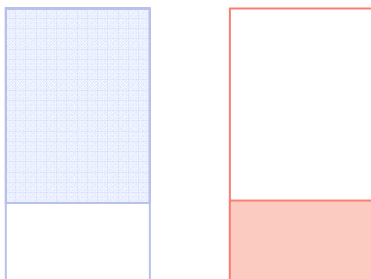
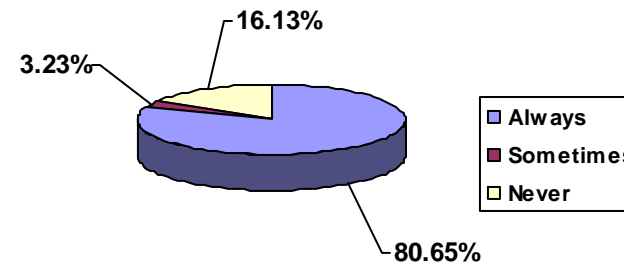
- **Q4: Do you ask for the diploma at undergraduate level**

- Always 54.84%
- Sometimes 19.35%
- Never 25.81%



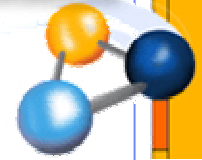
- **Q5: at graduate level**

- Always 80.65%
- Sometimes 3.23 %
- Never 16.31%



Cumulated Average on the entire population UG + G

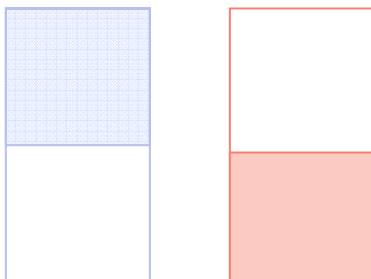
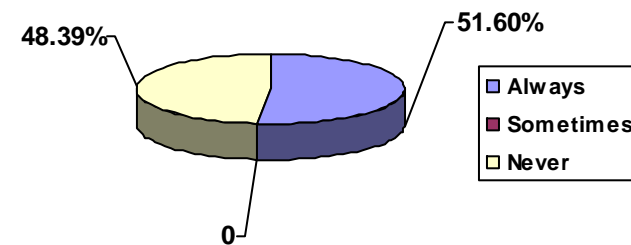
Always 67%
Always + Sometimes 80%
Never 21%



Findings

■ Q6.1: Do you ask for the Original diploma

- Always 0.01%
- Sometimes 51.60%
- Never 48.39%



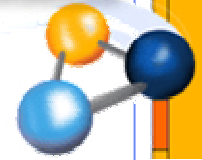
Cumulated Average on the entire population

always - always 0%

always - sometime 40%

sometimes - sometimes 33%

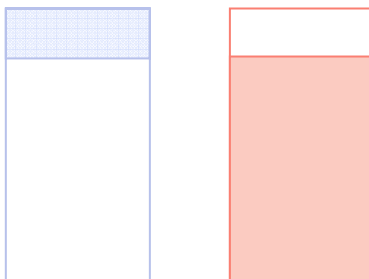
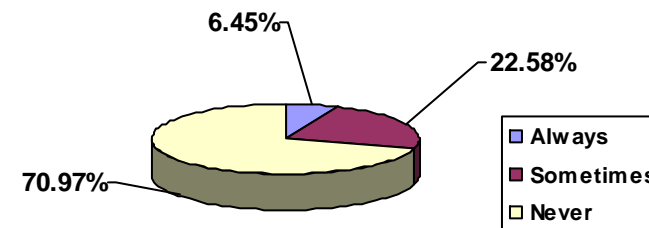
Never < 50%



Findings

▪ Q6.2: Do you Check/Verify the validity

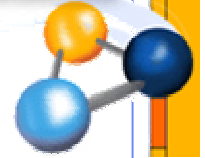
- Always 6.45%
- Sometimes 22.58%
- Never 70.97%



Cumulated Average on the entire population

Sometimes 10%

Never 90%

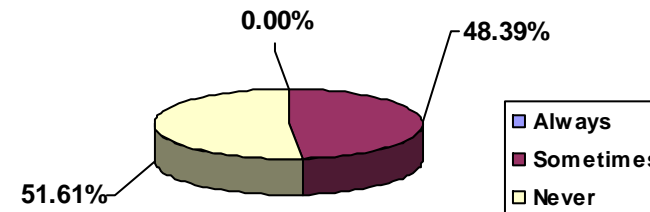


Findings

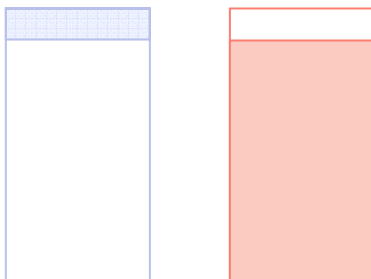
- **Q 7.1: Do you request the grades** Never: 83.87%

- **Q 8: Check the Content**

- Always 0.00 %
- Sometimes 48.39%
- Never 51.61%



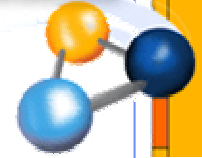
- **How:** Internet (97%), phone call (3%), email (0%)



Cumulated Average on the entire population

Sometimes < 5 %

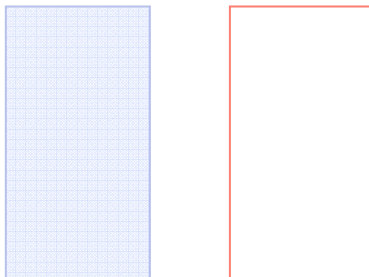
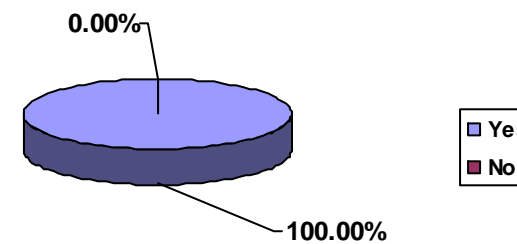
Never > 95%



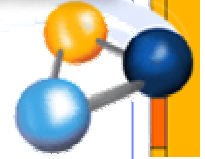
Findings

▪ Q 9: ODIC (Online Diploma information Certification)

- Always 100 %
- Sometimes 0 %
- Never 0 %



Grades: Yes (32.26%) - **No (67.74%)**
Course Content **Yes (64.5%)** – No (35.4%)



Findings

- Importance of diploma (80%)
- Legality (<30%)
- Acceptability (<5%)
- Credential Evaluation method (100%)



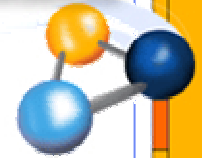
Corpus analysis

“Historical study” Framework

- **Method for automated corpora analysis (Historical Studies)**

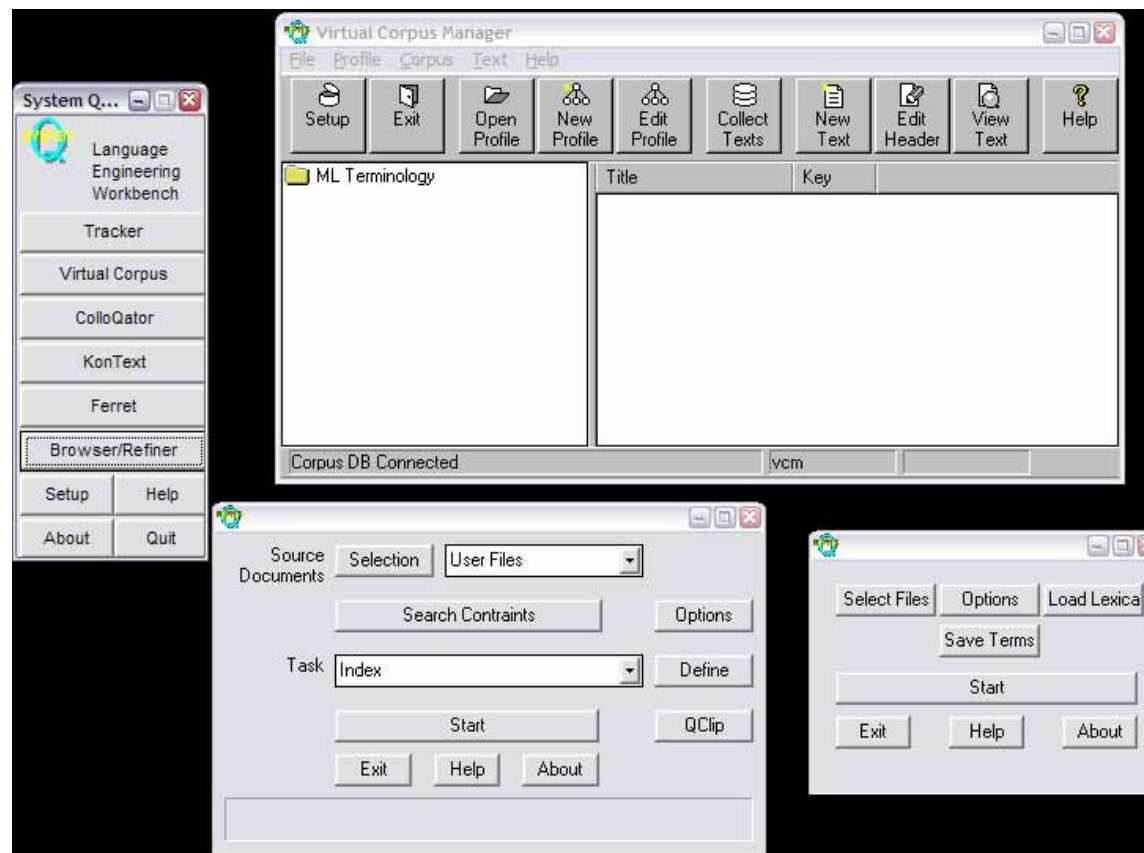
Collect a random sample of text corpora in a domain (may include sub-domains). That of investigation: IUM Higher Business Education

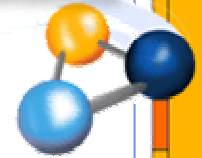
- Frequency analysis for single and compound specialist terms
- Collect another random sample (job offer) and compare the analysis
- Assumption
 - Frequency is a correlate of acceptability (Quirk, 1985)
 - Text is a trace of knowledge



Corpus analysis

System Quirk





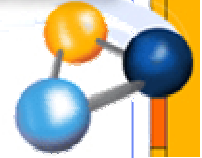
Historical Study

Corpus organization: syllabi

219 syllabi, 272560 words 12506 unique => Granularity 4.5%

Top 5 single word terms
with their collocations

Terms	freq	collocations	
		Left	Right
Business	906	Strategic, Global, Contemporary	Structure, Law, Venture Ethics, Strategy
International	621	Amnesty	Trade, Economy, Finance, Relations
Financial	514	Key, International	Indicators, Accounting, Analysis, Data, Feasibility, forecasting,
Management	483	Assets, portfolio, financial, database	System,
Group	474	Activity,	Work, project, situation, dynamics, presentation, discussion....



Compound Terms

Course Content

global marketing
organizational behavior
linear programming
consumer behavior
multiple regression
verb tenses
linear regression
global branding
inferential statistics
global brand

Course Practices

case study
grading scheme
online assessment
interactive presentation
group work
semester credits
grading guideline
internal examiners
project Team
guest speakers



Job Offer Text Analysis

Job offer corpus based on Monster.com

Using a small sample in business

8377 words - 1886 Unique, Granularity 22%

Business 169

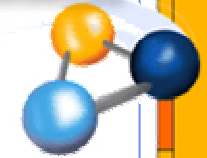
Management 69

Sales 63

Team 25 (practice)

Marketing 22

Financial 18



Terminology overlap

Syllabus TOP 5 single words

Based on IUM 2004 course offerings:
219 syllabus:
272560 words
12506 unique
Granularity 4.5%

Terms	Freq
Business	906
International	621
Financial	514
Management	483
Group	474

Job offer TOP 6 Single words

Based on Monster.com job offer web site

8377 words
1886 Unique
Granularity 22%

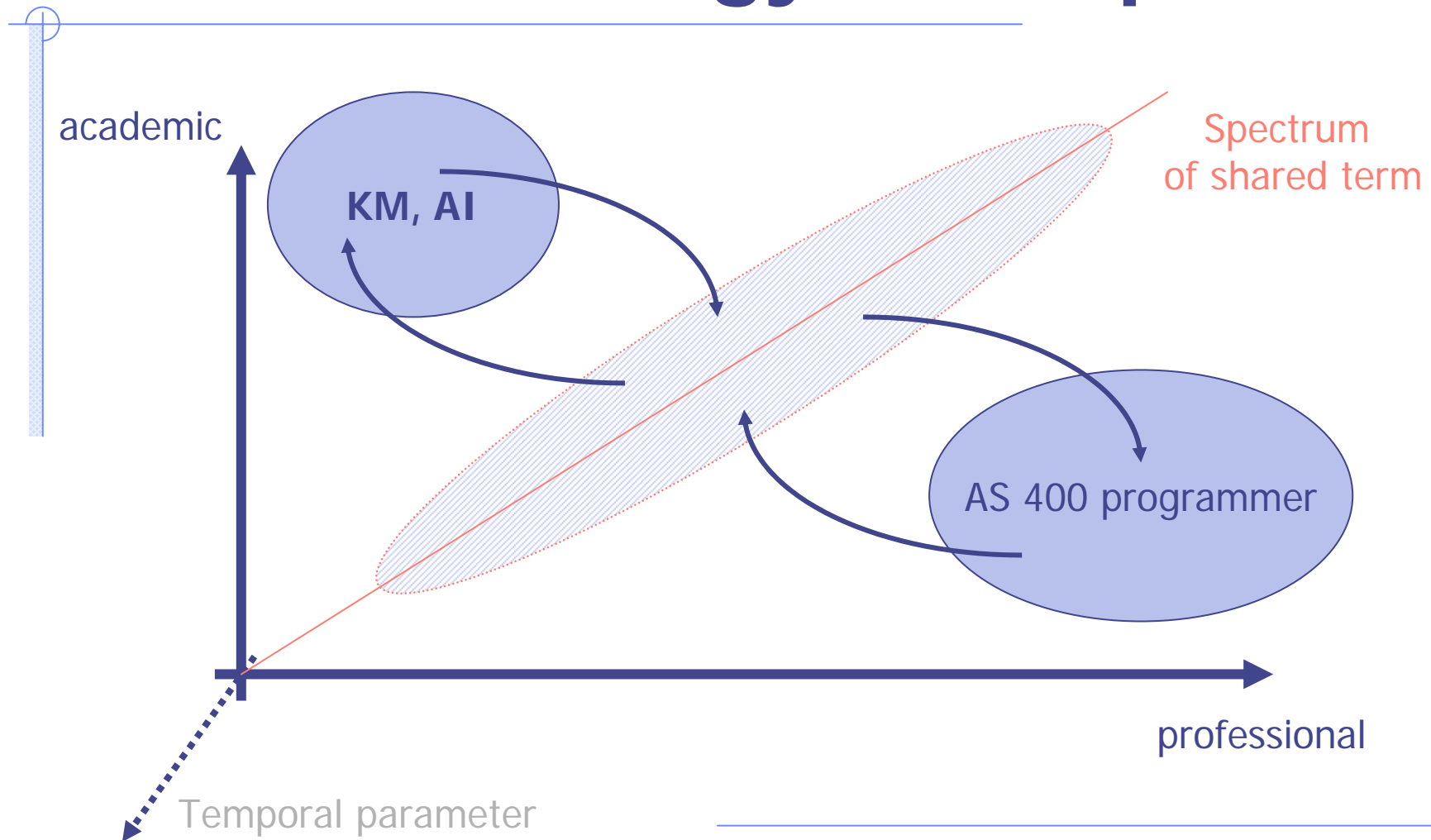
Terms	Freq
Business	169
Management	69
Sales	63
Team (practice)	25
Marketing	22
Financial	18

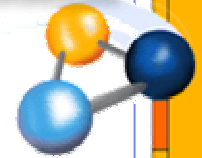


mutual information index/t-score
Matching / Dismatching

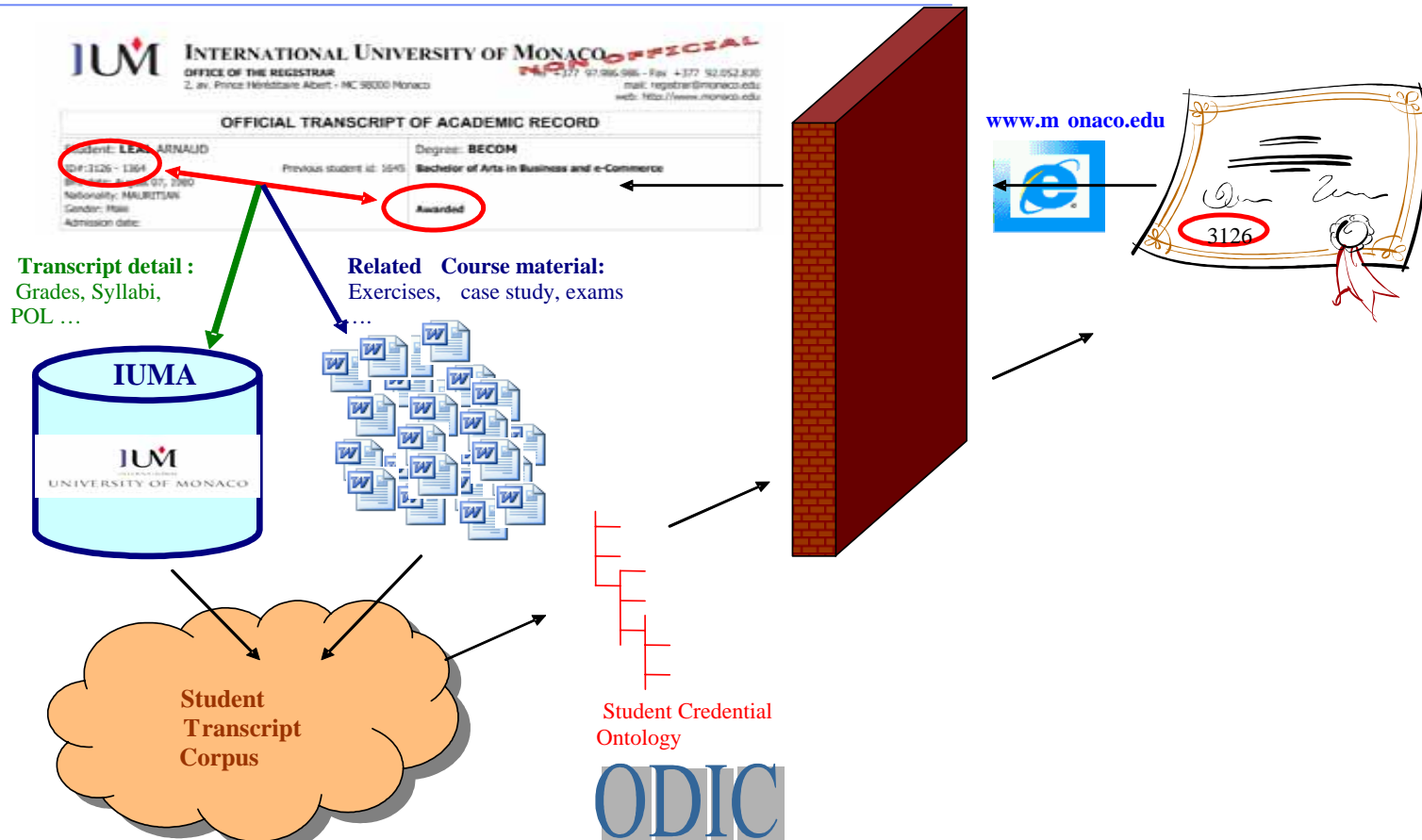


Terminology overlap

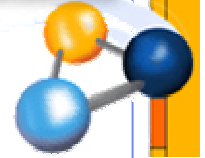




Support Tool IUMA / ODIC



Online Diploma Information Certification



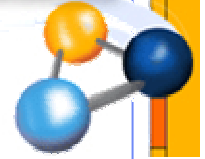
Research Evaluation

- Attempt to establish research links between observational and historical studies
- Applicability (ies) of *knowledge conversion model* (Nonaka *et al*, 1995) in an academic context (contribution to theory)
- Research within computer mediated knowledge management field
- Observational study laid the framework for the conduct of our research
- Observational study highlighted the fact that there was a really strong explicit relationship inside academic world
- Observational study pointed out the possible lack of acceptability and authenticity (correlate with George brown 2005)
- The above has led us to examine the relation between academic and professional world, and how text-based knowledge diffusion may take place
- Our analysis shows that academic documents and job offers can be correlated on the basis of single word and compound terms (Contribution to practice)



Outlook

- Multi lingual knowledge diffusion
- Analyzes Across specialized domains
- Internal knowledge diffusion of
 - Other specialized domain (Science)
 - Other institution
 - Other job offer
- Diachronic study to evaluate this temporal parameter identified
- Implement Ontological engineering methodology in line with Web services to automate credential evaluation in job offers or candidate assessment.



Concluding Remarks

- A bimodal (observational and data-driven) research study was conducted
- Terminology for evolving fields (higher education institutions and business marketplace)
 - Finding and matching unknown terms between diplomas (course material...) and job offers (company documents...) may demonstrate how knowledge is cross levelled
- Taking into consideration the profile the students want to show
- Students that did not complete their studies may take advantage of such validation
 - Reflective of the (sub) domain (s) knowledge acquired (validation)
- Cohesion between academic offerings and marketplace demands
 - Attempt to demonstrate such relationship
 - Adaptation based on changing demand
- Future, integrated into HR management tools, web robots: new ranking



Postscript

E-Learning and Ontologies of Domain Knowledge

Handbook for Educators Developing e-Learning (2006) (work in progress)

Mapping traces of knowledge, though AUTomated Organizational CARTography [AUTOCART]

IJIKM International Journal of Information, Knowledge, and management
Winter 2006 (under consideration)

Knowledge Dissemination and Validation: a Case of Academic Credentials

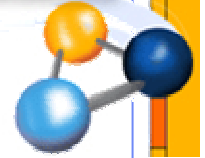
IRMA 2005, International Conference of the International Resources Management Association, San Diego, California, USA. May 15, 2005

The Practice of sharing specialist practice

Fall Conference - International Association for Computer Information Systems, Cancun, Mexico. IACIS 04

Computer-Mediated Extraction of Specialist Domain Practices

Annual Research Conference in Electronics, Photonics, Communications & Networks, and Computing Science, Hertfordshire, UK. PREP 04



Findings

- George brown findings in Australia & New Zealand (WES 2005)
 - 81% higher education verify the acceptability of a diploma
 - 77% higher education verify Authentication
 - 66% local recruitment agency does not verify the acceptability
 - 55% does not verify the authenticity
 - 70% accepted standard photocopy
 - 73% accepted education claims made by candidate in their CV without requiring further documentation.

- 2003 Cole, Field & Giles
 - Majority of employment evaluation were based on information provided in the CV, very little external validation were made.

- 2002 Christian and Timber study found that 52% of candidates had claim their partial degrees as full degrees.