

Curriculum Development

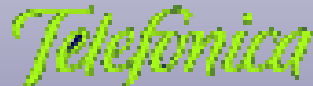
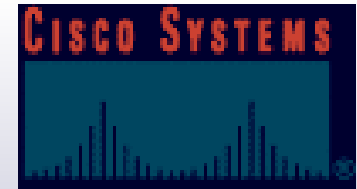
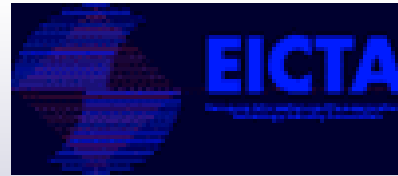
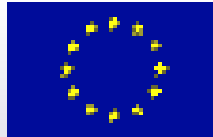
Tony Ward
University of York
aew6@york.ac.uk

Curriculum Development

CAREER SPACE

- Career-Space phases 1 and 2
- Generic skills profile & Curriculum guidelines
- ‘PanICT’ Project
- ‘Genius’ Project

The Career-Space Consortium



Career-Space : the problem

- ICT Industry skill shortage forecast
 - 860,000 end of 1999
 - 1.74m end of 2003¹
- 68% of SMEs in Western Europe report that growth is hindered by “an acute shortage of skilled IT workers”
- Before the ‘*Internet bubble*’ burst but still considered appropriate by Industry

¹ IDC Report “Europe’s Growing IT Skills Crisis”

Consequences

- Major threat to development of ICT industry
- Major threat to competitiveness of the whole European economy
- “Estimated loss within Western Europe is 380 billion Euro in GDP over next 3 years”²
- Relocation of companies to outside Europe
- A high staff turnover resulting in disincentives to train, damage to organisational culture ...

² Datamonitor report “The Economic Impact of an IT Skills Gap in Western Europe”

Career-Space project objectives

“to put in place a clear framework for students, education and training institutions and Governments, that describes the skills and competencies required by the ICT industry”

Outcomes:

- A set of 18 generic job profiles Phase 1
 - Introductory academic survey
 - Curriculum development guidelines
 - A dedicated web site
- } Phase 2

Generic job profiles

- **Telecommunications**
 - Radio frequency engineer
 - Digital design
 - Data Communications engineering
 - Digital signal processing Applications Design
 - Communications network design
- **Software and Services**
 - Software and application development
 - Software architecture and design
 - Multimedia design
 - IT Business consultancy
 - Technical support
- **Products and Systems**
 - Product design
 - Integration and test / Implementation & Test engineering
 - Systems specialists
- **Cross Sector**
 - ICT Marketing Management
 - ICT Project Management
 - Research & Technology Development
 - ICT Management
 - ICT Sales Management

Generic job profiles

- Each profile:
 - Job description
 - Tasks associated with the job
 - Technology areas associated with the job
 - Description of career path/future opportunities

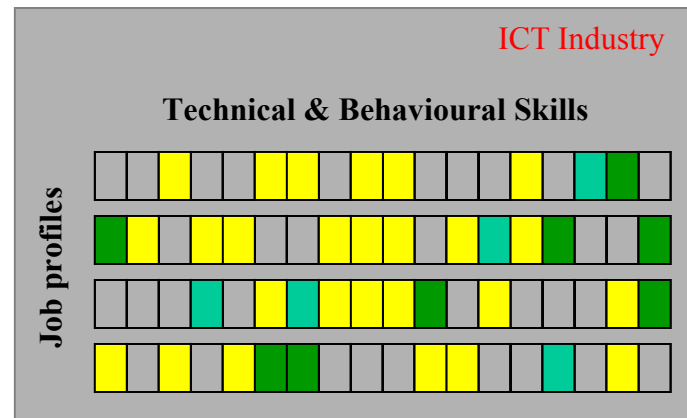
Skills (18)

Technical (>50)

- Analogue / Digital design skills
- Computer programming
- Cost modelling
- Reliability engineering
- TCP/IP, UNIX, X25,
- FPGA

Behavioural (>20)

- Decision making
- Information handling
- Initiative
- Leadership
- Managing risk
- Negotiation



2D – Academic Survey

- | | | | |
|----------------------|---|----------------------|---|
| • SW arch design | F | • RF engineering | F |
| • Digital design | F | • Data Comms Eng | F |
| • Systems specialist | F | • IT Bus Consultancy | P |
| • DSP Apps design | F | • Technical support | F |
| • Comms network | F | • Product design | F |
| • Multimedia design | P | • Test & Integration | F |
| • SW apps devt | F | | |

Fully covered

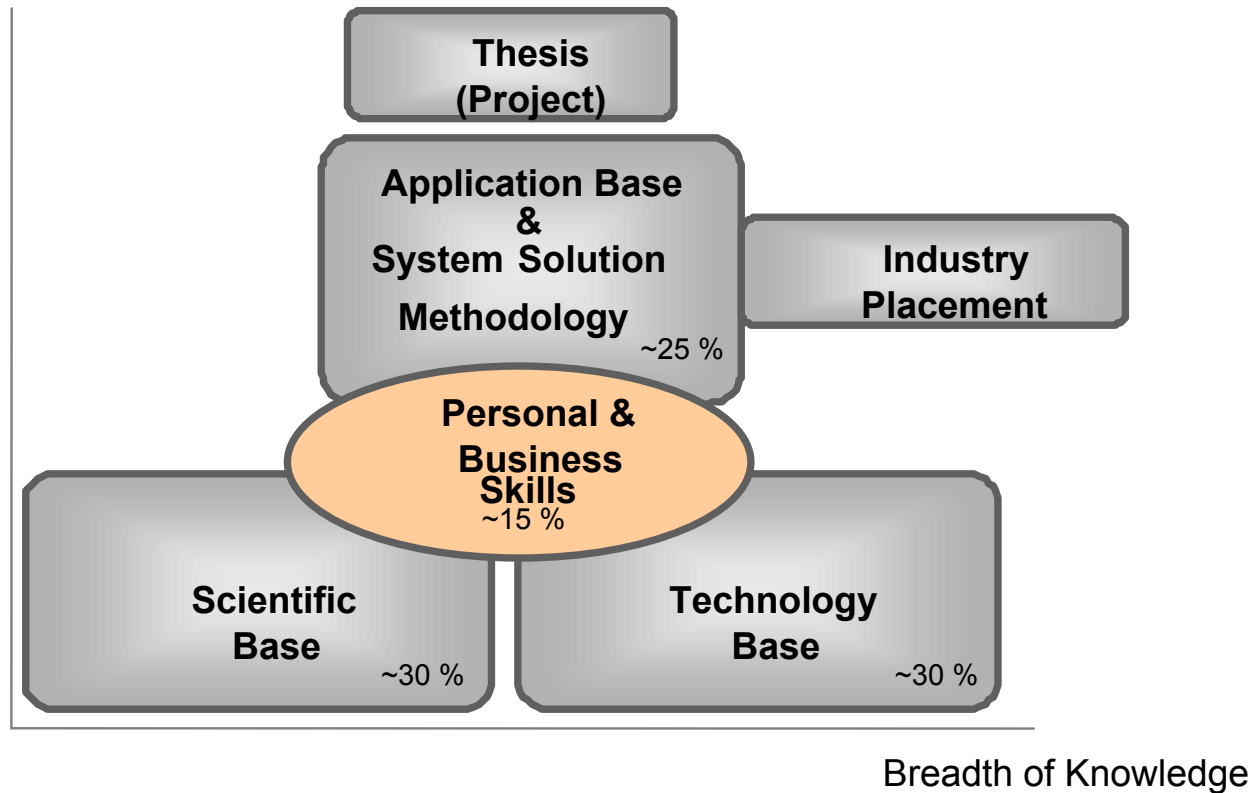
Partially covered

Not covered

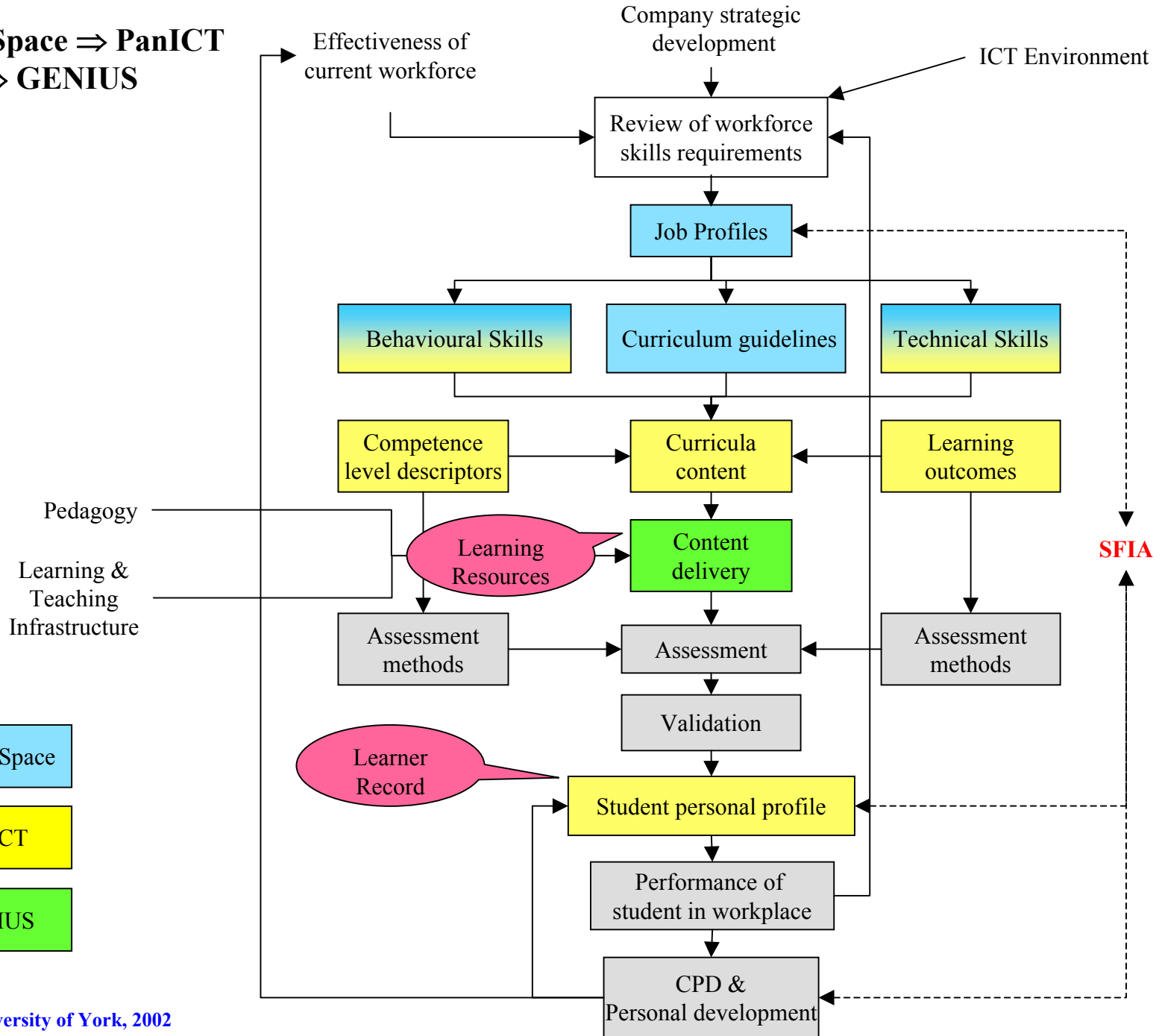
Science base (SB)
Technology base (TB)
Engineering subjects (ES)
Non-technical skills (NTS)

General Curriculum Guidelines

Depth of Knowledge



**Career-Space ⇒ PanICT
⇒ GENIUS**

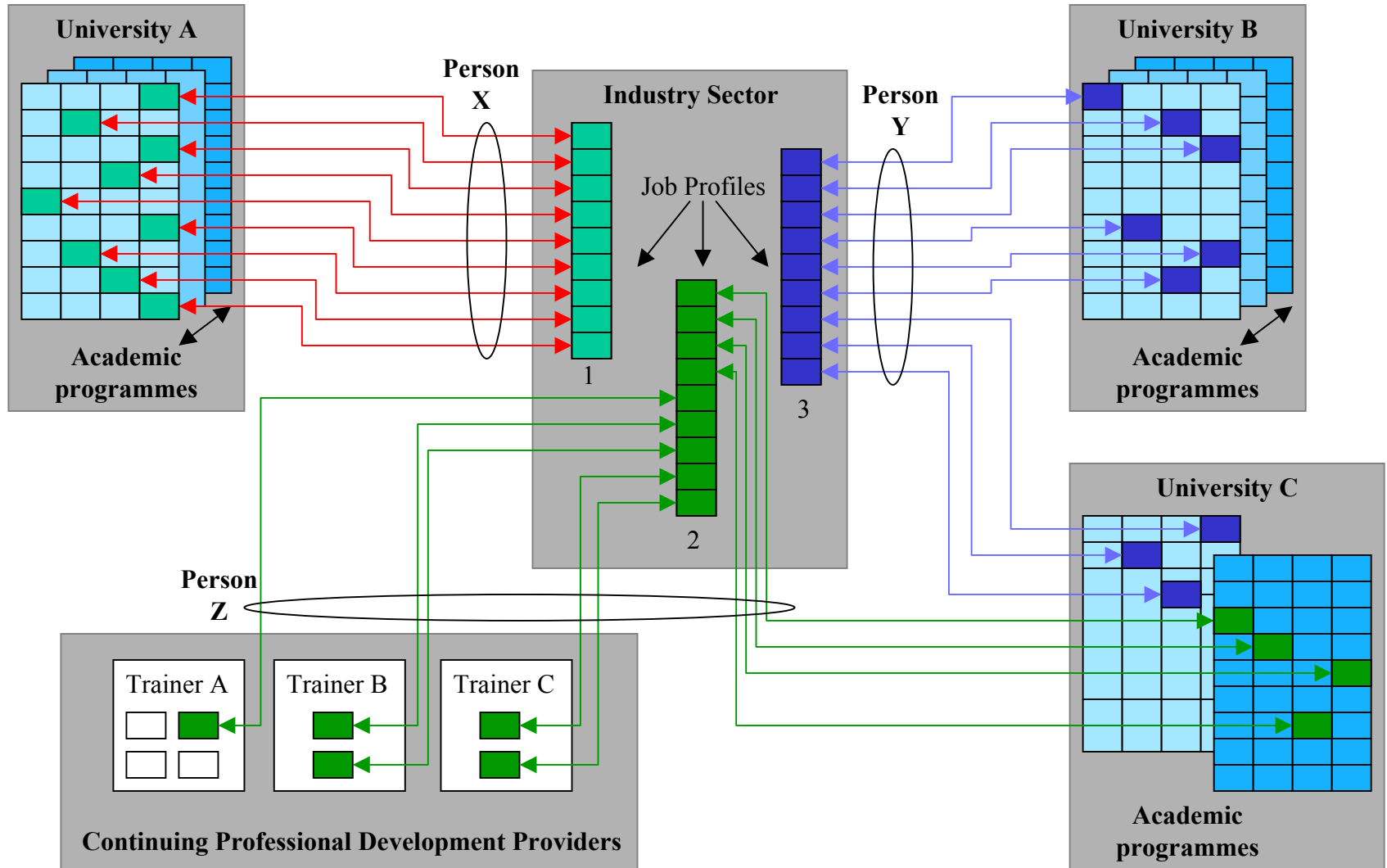


PanICT

DTI funded feasibility study through eSkills NTO

- *Passport to the ICT Industry / Graduate Apprenticeship*
 - is an authorised record of student achievement against an agreed set of benchmarks
 - sits alongside the academic qualification
 - enables and promotes student mobility within the National & Institutional rules (+ Bologna agreement)
 - is quick to implement
- Detailed academic content for the technical skills
- Dimensional analysis of the behavioural skills
- Set of level descriptors for component behavioural skills

Routes to acquiring skills necessary for job profiles

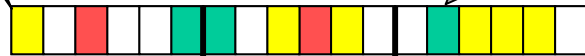


Statistics:

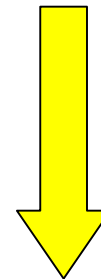
Mean, Standard Deviation, Histograms, frequency distributions. Discrete and continuous random variables. Probability theory, discrete random variables, continuous random variables and the probability density function, special distributions, the Central Limit Theorem;

Communication

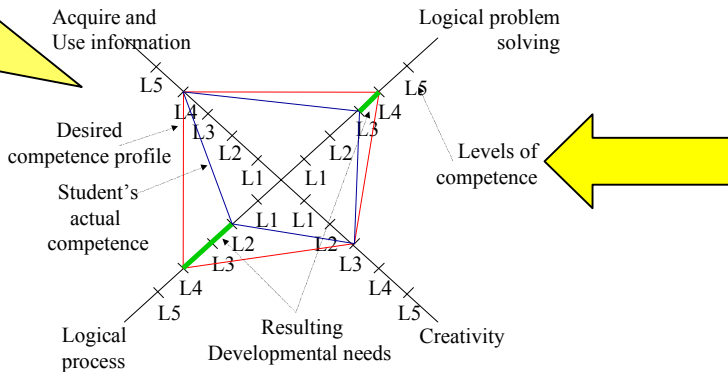
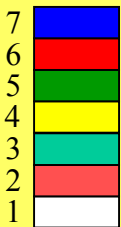
Able to communicate effectively face to face, on the phone, in writing and via presentations. Knows when to abstract complex technical concepts and describe in terms meaningful and relevant to technical and business managers and to other non-technical people. Also knows how to obtain the maximum understanding from other people. Is able to build a network of contacts who can provide information and assistance.



**Technical Business Behavioural
Individuals Skills Set**



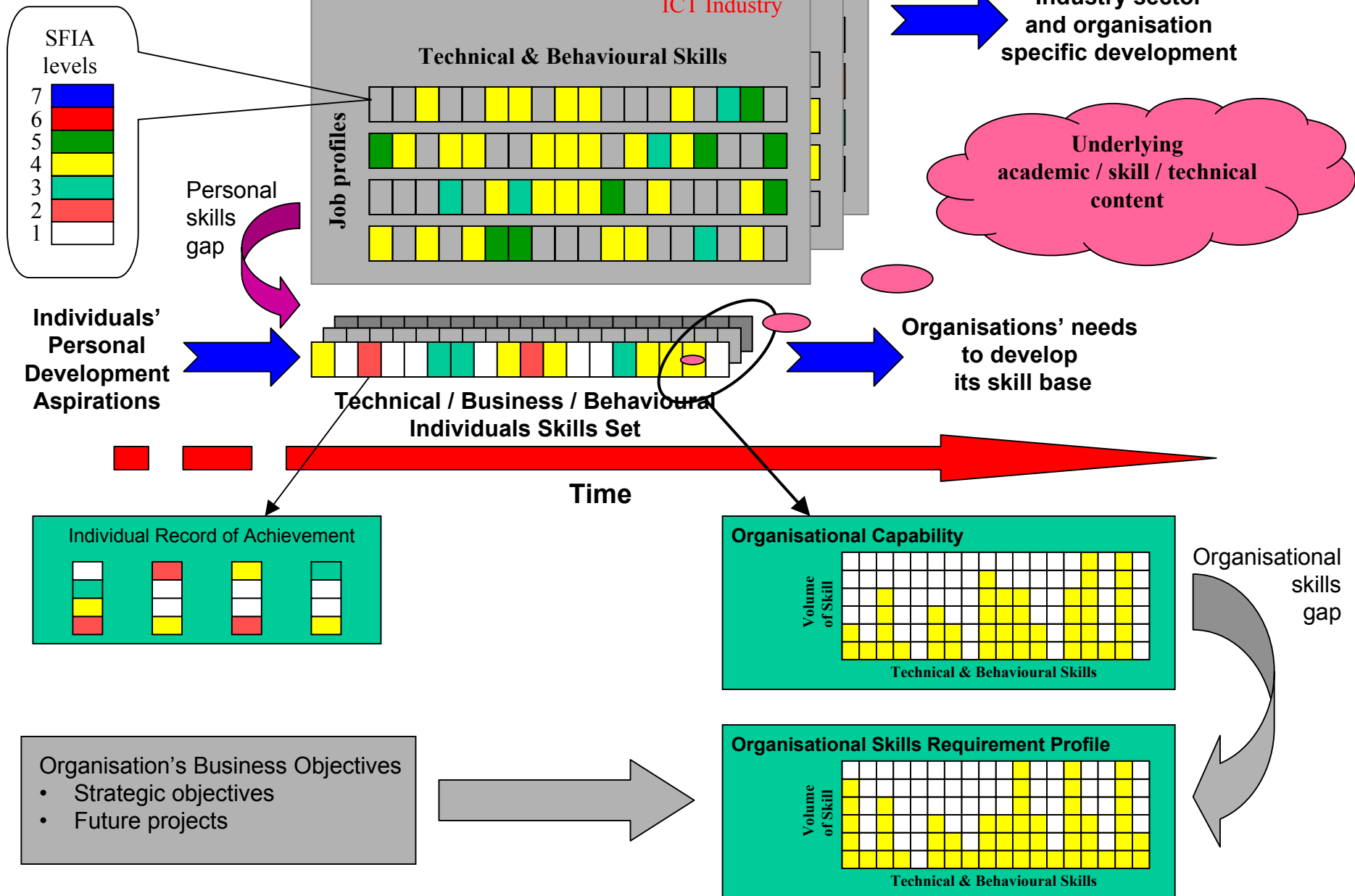
SFIA levels



Communications component skills

- One-to-one communication
- Written communication
- Public presentation
- Obtain information from others
- Develop and build relationships for networking purposes

Matching the individual to the organisation



Cradle to grave learning

**Passport to Industry
Individual's profile**

Individual Record of Achievement

Banking/Finance
Automotive Industry
ICT Industry

Technical & Behavioural Skills

Job profiles

SFIA levels

7	Blue
6	Red
5	Green
4	Yellow
3	Cyan
2	Red
1	White

Matching Individual to jobs / Companies / Sectors

Technical / Business / Behavioural
Individuals Skills Set

School
College
Distance

Sub-degree / Pre-degree / Alternative

University C
University B
University A

Academic programmes

Trainer A
Trainer B
Trainer C

Continuing Professional Development Providers

GENIUS

Generic E-Learning Environments and Paradigms for
the New European ICT Curricula

Funded by the EC e-Learning

GENIUS - Objectives

- New Curricula content development based on the ICT curricula guidelines of Career-Space.
- Investigation of different innovative content delivery mechanisms corresponding to the new pedagogical paradigms.
- Development of pilot pan-European collaborative e-Learning environment
- Evaluation and validation of the approaches
- Dissemination of results

GENIUS - Consortium

- University of Reading, *UK*
- University of York, *UK*
- Trinity College, *Ireland*
- University of Thessaloniki, *Greece*
- University CarlosIII Madrid, *Spain*
- University of Ulm, *Germany*
- INSA LYON, *France*
- University of Linkoping, *Sweden*
- INESC Porto, *Portugal*
- Support IT, *UK*
- IBM, *UK & Europe*
- Intel, *Ireland*
- ICEL, *Belgium*
- e-Skills, *UK*
- Philips Semiconductors, *UK*

Key

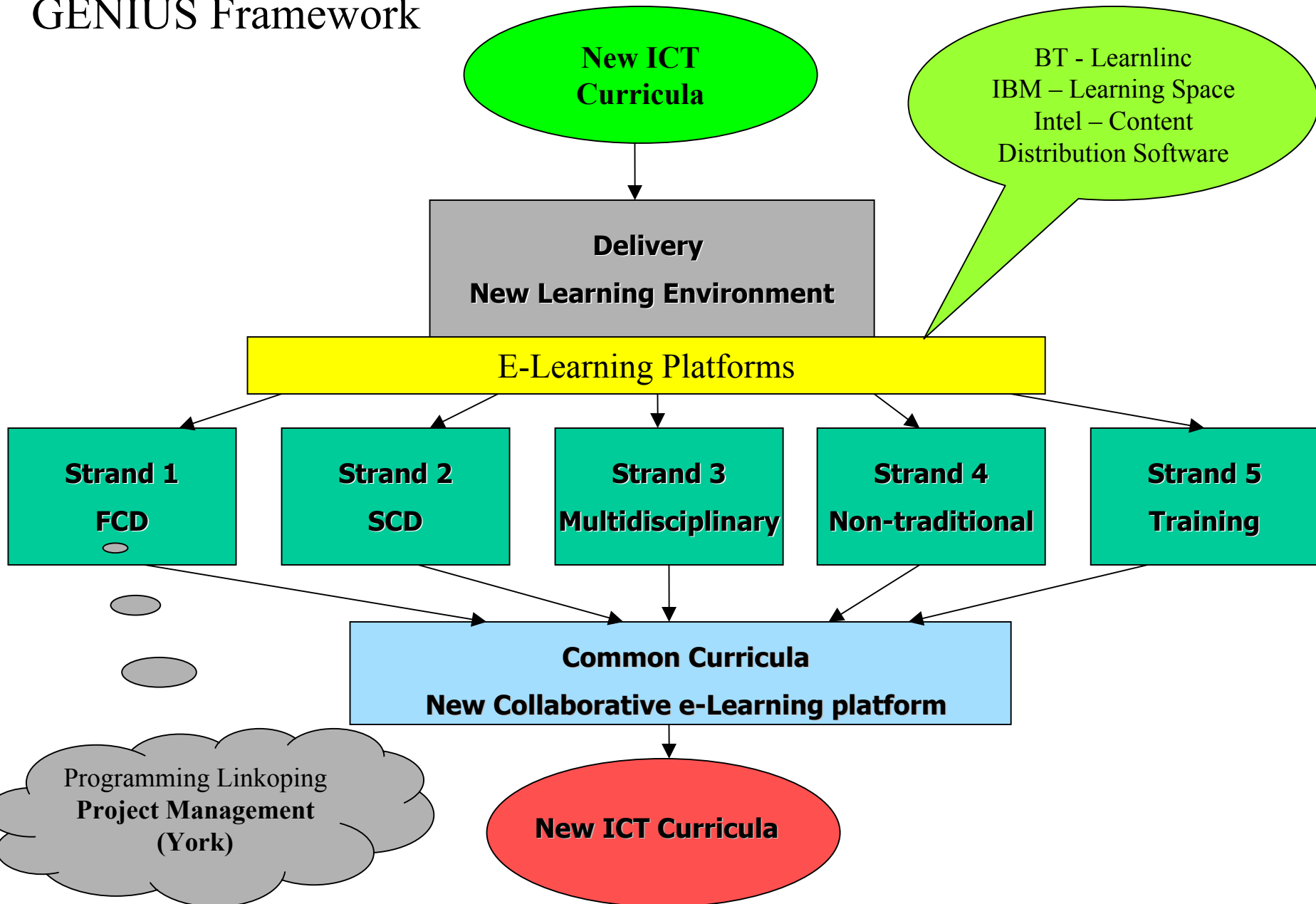
First Cycle Degrees

Second Cycle Degrees

Non-Conventional Learners

Pedagogy

GENIUS Framework



Summary

- Career-Space (Phases 1 & 2)
 - Profiles
 - Framework
- PanICT
 - Passport
 - Academic content
 - Levelled behavioural skills (SFIA)
- GENIUS
 - Delivery mechanisms
 - Widening access through VLEs
- Career-Space (Phase 3)
 - Graphics & Media
 - Banking & Finance
 - Automotive & Aerospace
 - SME's
 - Business Skills
 - Foster acquisition of skills



Implementation

Supply and demand

- A severe gap has developed as a result of:
 - exponential growth of ICT
 - organisational structure and working methods
 - globalisation and labour mobility
 - inability of education system to meet demand in sufficient quantity
 - relatively low and falling interest in ICT related and technical studies