

Radio Frequency Identification (RFID) Qualification in Logistics

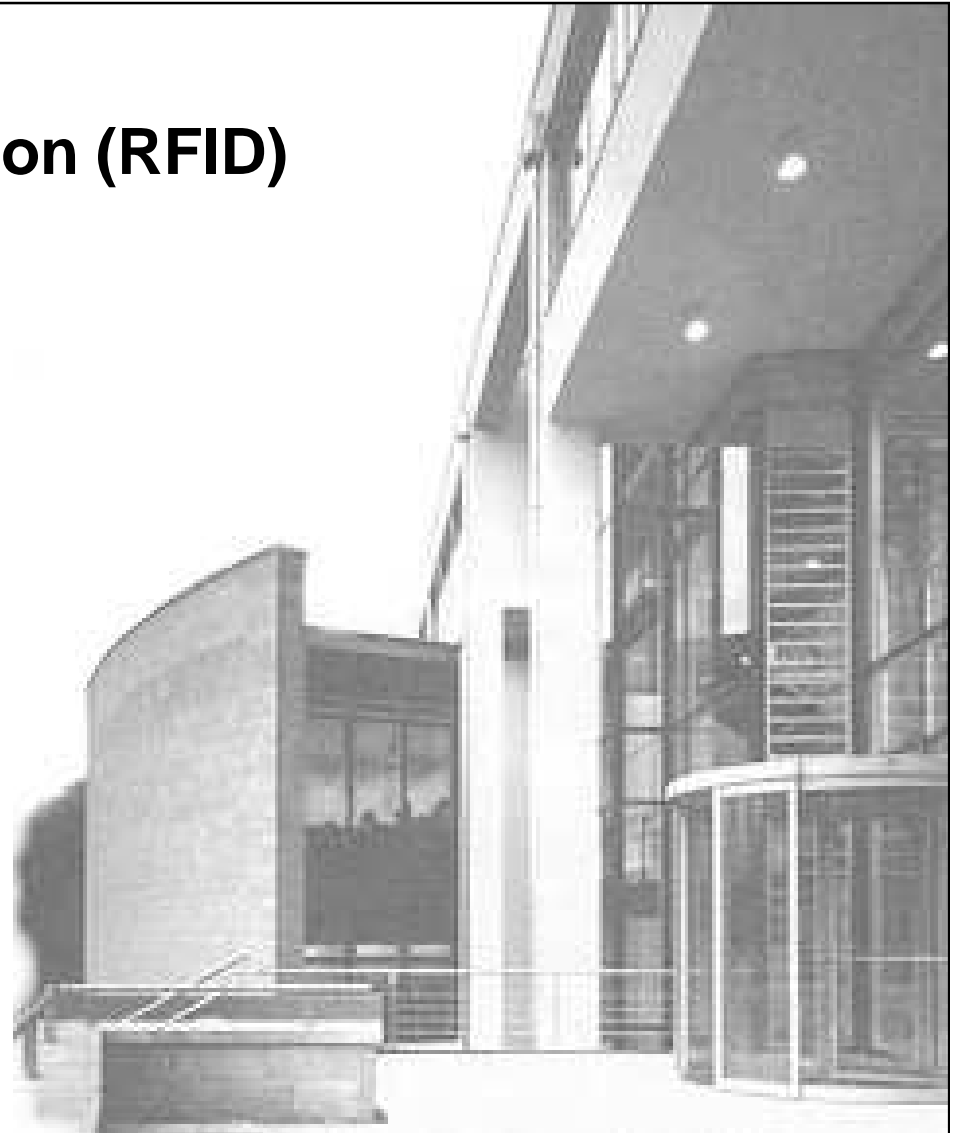
Sascha Bioly

Thomas Keuschen

Matthias Klumpp

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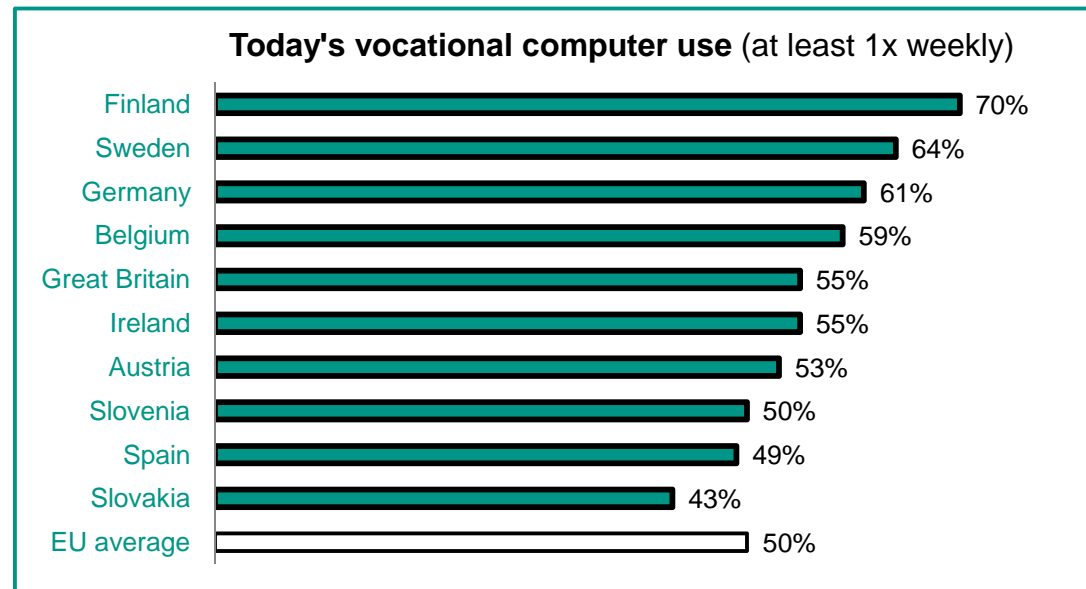
1. Development of PC/Internet and RFID
2. Qualification Concept (EQF)
3. RFID meets EQF
4. Conclusion

1. Development of PC/Internet and RFID

Possibly the development of RFID is comparable with older technologies, which have been established

For example personal computer (the Internet) with various analogies:

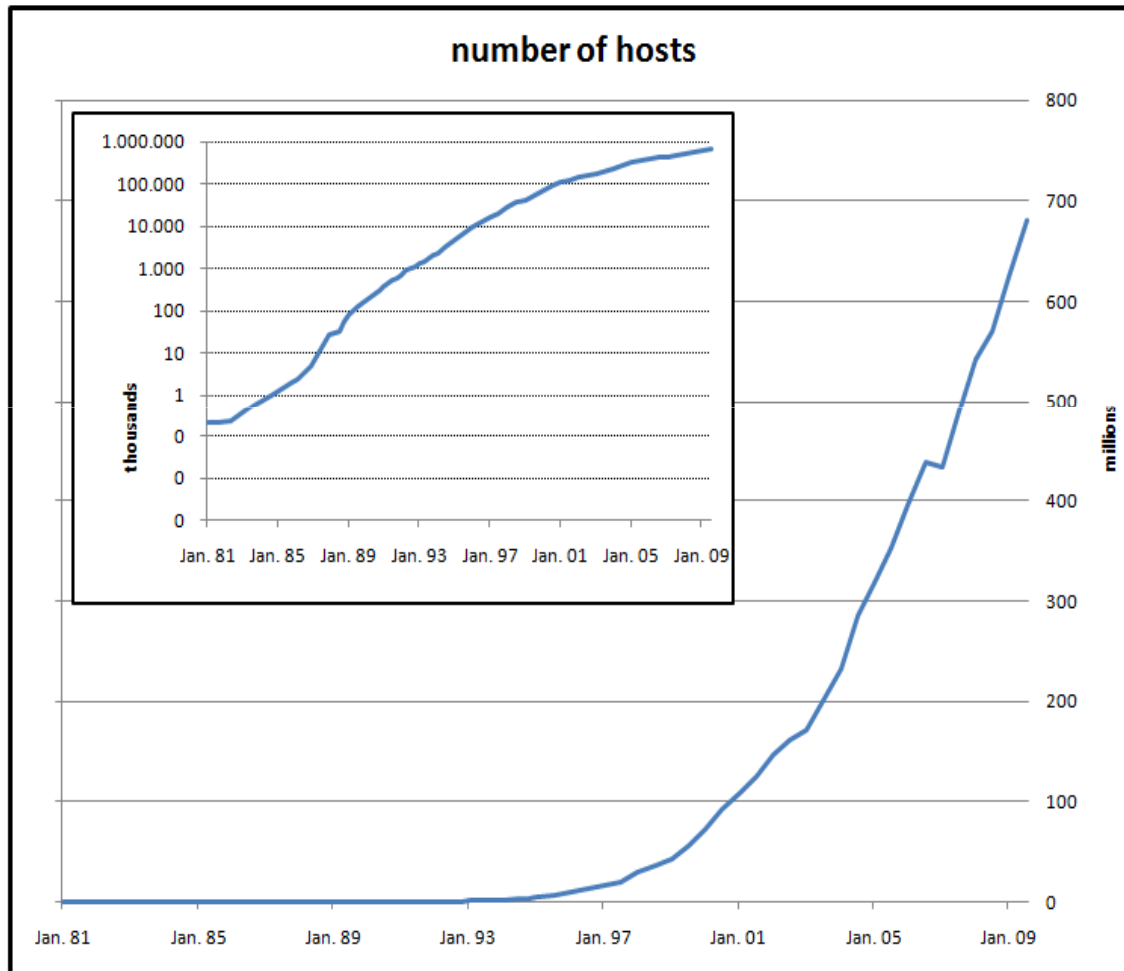
- A PC was provided with capital investment,
- need of qualification,
- technical hurdles,
- many reservations and
- processes must be changed
- ...



Nevertheless it cannot be excluded in the meantime from the workday no more!

1. Development of PC/Internet and RFID

Growth of the Internet from 1981 till today:



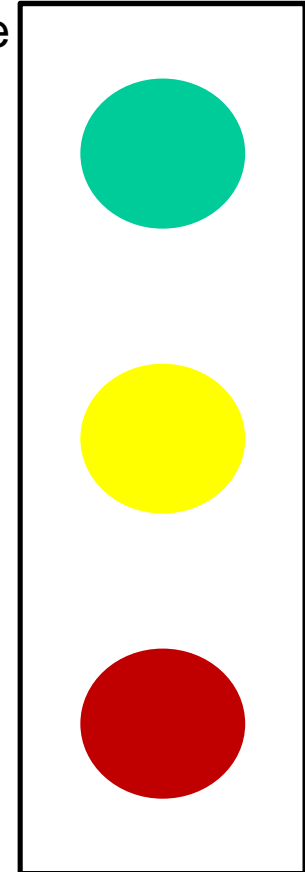
date	no. of hosts
Aug 81	213
Mai 82	235
Aug 83	562
Okt 84	1,024
Okt 85	1,961
...	...
Dez 87	28,174
Jul 89	130,000
Okt 92	1,136,000
Jul 96	12,881,000
Jan 01	109,574,429
...	...
Jan 07	433,193,199
Jul 07	489,774,269
Jan 08	541,677,360
Jul 08	570,937,778
Jan 09	625,226,456
Jul 09	681,064,561

1. Development of PC/Internet and RFID

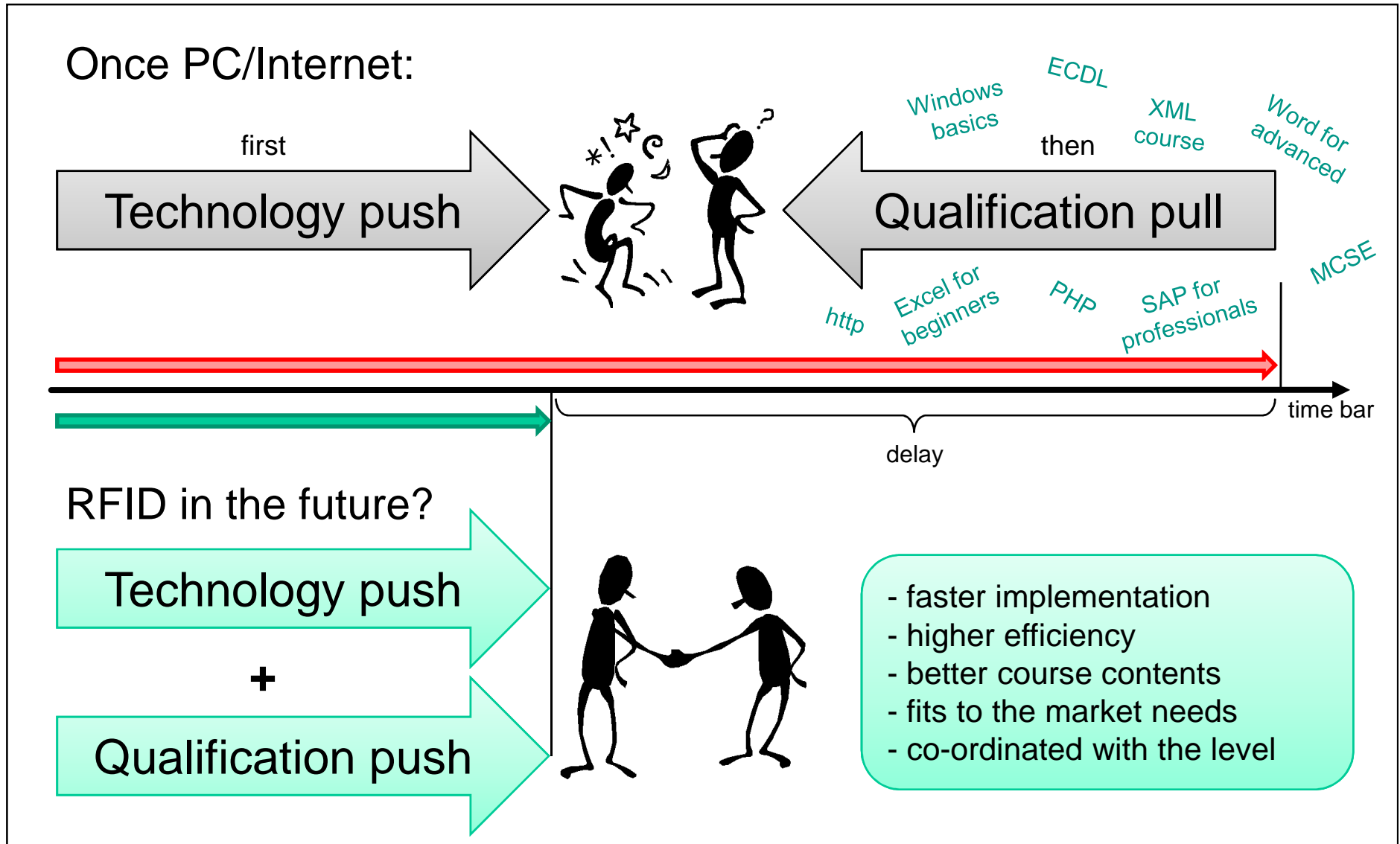
Status RFID: It is a phenomenon / paradox.

- A look at the engineering science reveals that the **research** in the field RFID can be regarded as far advanced, even concluded
- Although still far away to be an application of masses it has developed itself in economics and innovation **discussions** within short time to a central hope for industry, logistics and trade
- Another look at business practice today reveals that there is only rudimentary **day to day use** of RFID in working environments

As soon as this changes there is a new hurdle: **Qualification.**



1. Development of PC/Internet and RFID



2. Qualification Concept

European Qualifications Framework (EQF)

The **European Qualifications Framework** is a tool to increase the **transparency** of qualifications across Europe.

Lisbon strategy or the connection of Bologna and Copenhagen process supported by EQF and ECTS/ECVET

- based on learning outcomes
 - + knowledge, skills, competence (KSC)
- centred on qualifications
- emphasis on Lifelong Learning
- focused on Mobility
- transparency oriented



2. Qualification Concept

ECTS* & ECVET**

1999 **Bologna process**: "...creation of a common European **Higher Education** Area until 2010."

ECTS for higher education:

- ECTS is the furthest advanced projects of the European union to make different national education systems and education standards
- Since for the entire education range within the European union a harmonization prohibition is valid, all relevant goals, initiatives and process are based on the voluntary and in certain degree also noncommittal co-operation of the member states
- Regardless of this European legal definition the ECTS process contributed to one of the largest transformations of the German university landscape
- The ECTS refers to training in the tertiary sector, thus to study programmes and degrees at universities

ECVET is a system of point of achievement for vocational training

- Which is developed at present in the European framework
- School learning achievements, vocational education, additional individual vocational experiences and learning processes are to be illustrated in a uniform scoring system

Goals of the ECVET:

- Use of a European-wide uniform assessment basis for qualifications and learning results
- Transparency of learning careers
- Transnational mobility is to be promoted
- Entrance to lifelong learning is to be supported and facilitated thereby

* **European Credit Transfer [and Accumulation] System**

** **European Credit System for Vocational Education and Training**

2. Qualification Concept

European Qualifications Framework (EQF)

	EQF-Level	1	2	3	4 - 7	8
knowledge	in the context of EQF, knowledge is described as theoretical and/or factual	- basic general knowledge	- basic factual knowledge of a field of work or study	- knowledge of facts, principles, processes and general concepts, in a field of work or study	⋮	- knowledge at the most advanced frontier of a field of work or study and the interface between fields
skills	in the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical	- basic skills required to carry out simple tasks	- basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve problems using simple rules and tools	- a range of cognitive and practical skills required to accomplish tasks and to solve problems by selecting and applying basic methods, tools, materials and information		- demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research
competence	in the context of EQF, competence is described in terms of responsibility and autonomy	- work or study under direct supervision in a structured context	- work or study under supervision with some autonomy	- take responsibility for completion of tasks in work or study - adapt own behavior to circumstances in solving problems		- demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

3. RFID meets EQF

exemplary education contents

Pairing EQF with necessary RFID-topics the following education contents result:

EQF-Level	1	2	3	4	5	6	7	8
knowl.	See previous chart							
skills								
comp.								
lawful	these three divisions are exemplary	Knowledge of the health and/or data protection regulations						
technical		knowledge about: batch capturing, different materials, etc.						
commercial		Be able to do a complete investment calculation						

3. RFID meets EQF

exemplary education contents

Level 2 - lawful means:

- to have means over the professional fulfillment of fundamental requirements in a straightforward and stable and structured learning or work area the fulfillment of tasks takes place far going under guidance

Exemplary qualification contents:

- fundamental fact knowledge about legal regulations to the data and health protection in connection with RFID
- e.g. over the EN standard EN50357, where the limit values valid for RFID systems are fixed

Goal: the members of staff know those their work area concerned legal regulations and are able to act law-conformal

3. RFID meets EQF

exemplary education contents

Level 3 - technical means:

- to have competence for the independent fulfillment of technical requirements in a still manageable but partially openly structured learning range or a vocational field of activity

Exemplary qualification contents:

- to have knowledge around the problems with the
 - a) batch capturing in practice (multiple recognized duplicates can lead to a crash of the data base)
 - b) technical hurdles in handling of combination of liquids/metals and RFID and their solutions

Goal: the members of staff are able to recognized independently application-oriented technical errors after briefing.

3. RFID meets EQF

exemplary education contents

Level 7 - commercial means:

- to have competence for the treatment of new complex problem definitions as well as for the solely responsible control of processes in a scientific subject or in a strategically oriented vocational field of activity
- this level is characterized by frequent and unforeseeable changes

Exemplary qualification contents:

- placing „all“ possibilities of view of monetary effects of RFID in the entire area of responsibility - investment calculation for a whole department

Goal: the members of staff have new ideas or procedures-specialized technical and conceptual talents for the solution of also strategic problems and they can trade off also with incomplete information alternatives, develop new ideas or procedures, etc.

4. Conclusion

If there are '*global uniform standards*', '*possibility of economy calculation*' and '*education contents*' theoretical knowledge about RFID will be successfully and profitably used in practice.

Such a grid as introduced here can help to find

- the correct education **contents** and
- training **depth** for the respective operational area (e.g. truck drivers, administrative personnel, management personnel)

On a *strategic level* knowledge demand is different from the *operational level*

→ no 'brick' should remain unnoticed ←

RFID cannot develop its entire potential if only managers know the '*how to*' and what would be theoretically possible with this technology, while the '*users*' have no notion about how to work with RFID.

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Thank you for your
kind attention.

Innsbruck, 04.03.2010

