F R E E

From Research to Enterprise

Training Guide

CENTRAL EUROPE
COOPERATING FOR SUCCESS.

EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND

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FREE
From Research to Enterprise

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Background

FREE intends to contribute to the regional development of Central-Europe by setting up innovation-oriented systems, methodologies and services bridging technical experts, researchers, entrepreneurs and policy makers.

This goal will be pursued by developing instruments, actions and skills which facilitate the use of research results by the business sector (especially SMEs). The intention is to develop tangible instruments and human skills to foster dissemination of innovation into the business sector through a transnational framework adapted to regional dimensions.

FREE had been launched in November 2008 with the participation of 7 partners from 5 regions and will last 32 months.

FREE partners are directly connected to local and regional actors involved in programming and implementing innovation policies, as they are RTD centres, regional innovation centres, university technology transfer offices and business incubators created by local governments and local authorities as well. The common mission is to develop and offer innovation-supporting systems and services.

The project partners are:

- University of Debrecen, Region Észak-Alföld, Hungary
- Municipality of Velenje, Region Vzhodna Slovenija, Slovenia
- TechnoCenter at University of Maribor d.o.o., Region Vzhodna Slovenija, Slovenia
- Centuria RIT, Region Emilia-Romagna, Italy
- Amitié, Region Emilia-Romagna, Italy
- Klimentovska PLC, Region Severozapad, Czech Repubic
- Multipurpose Union of Kecskemét and its Region, Hungary

Objective of the guide

The creation of a Network of mediators of innovation (Work package 5) and their training is one of the core activities of the FREE project. The mediators are supposed to become catalysts enabling the access to research by fostering close and productive relationships between internal and external stakeholders – universities and the business and venture community, respectively.

The major goal of this guide is to support project partners and training providers to design career and technical training that covers the most relevant knowledge areas within a quality framework and in line with European nascent qualification standards.

The content used is the result of an information exchange with a similar project combined with the analysis of the current training offer. For this purpose some hundreds of training courses dealing to some extend with human resource development for innovation transfer were analysed in Hungary, Italy, the Czech Republic and in Slovenia. 40 particularly pertinent courses were then selected. The scrutinised course offered an insights in the ways in which similar courses have been structured across Europe over the last 2–3 years.

Structure of the guide

The guide is divided into three sections:

Section 1 – General Instructions

Section 1 provides general instructions for training course development. The final templates are useful tools for effective course planning and evaluation.

Section 2 – Knowledge Areas

Section 2 introduces the emerging areas of knowledge and professional activity in the field of technology transfer. It represents a sort of inventorisation of subject areas covered in the 40 analysed training courses.

Section 3 – Key Skills

The section describes the seven core skills identified as strategic for people who want to work as professionals in the technology transfer field at European level. It introduces a possible training framework.

Section 4 – Training Course Analysis

The last section provides a short overview on the 40 analysed training courses and the most frequent training topics.

SECTION 1 – General Instructions

General instructions for training course design

There are some basic steps for course design which a valid for any sort of training course and are independent from the course subject. They are fundamental steps for effective course development. Creating a course for any learning situation can be done following a simple step-by-step process. It can be as complex or as simple as you need it to be, considering your audience.

Proceed through each of the following steps presented in this section. The final template will help you go step by step through the process of training course design, independently from the topics you are focusing on. The template on course evaluation should be used as a hand-out to assess the satisfaction of the participants once the training programme is over.

A. Preparation for designing your training course start

Don't worry about whether your plan is perfect or not – the plan is a guide. There is no "right" solution in designing training.

B. Get to know some basic terms

There are some fundamental terms you should be familiar with.

training goal	learning objectives	learning methods	evaluation
overall results or capabilities you hope to transfer by implementing your training course e.g.: Improve innovation transfer	establishing precise / measurable learning objectives, related to what the learner should be able to do following the training. – Should derive from the identification and analysis of training needs	what you will do in order to enable learning.	this category includes assessment tools for identifying and/or measuring skills and capabilities.

C. Setting your overall goals in training

This section helps you identify what you want as a result of your training course, for example: qualify your participants for a certain job, help them to overcome a performance problem; allow them to meet a goal in their career development plan, etc.

1. **Are there any time lines that you should consider in your plan?** Do your course participants have to accomplish any certain areas of knowledge or skills by a certain time? If so, this may influence your choice of learning objectives and learning activities to achieve the objectives.
2. **Are you pursuing training and development in order to address a performance gap?** A performance gap is usually indicated from the training need analysis. The analysis should already include careful description of the areas of knowledge and skills that your participants must learn in order to improve their performance.
3. **Or, is your plan to address an opportunity gap?** If so, carefully identify what areas of knowledge and skills are needed to perform a certain job or role that soon might be available to your participants. Again, consider job descriptions, lists of competencies or even interviewing someone already in the job role that may soon be available to you.
4. **Begin thinking about how much money you will need to organise your course.** You might need money, e.g., to pay trainers, obtain facilities and materials for training methods, pay wages or salaries for employees during attendance to training events, etc. Begin recording your expected expenses in the "Budget" section of the Framework to Design Your Training Plan.
5. **Identify your training goals.** By now, you should have a strong sense of what your training course goals are, after having considered each of the above steps. It is important that your goals are: **S**pecific, **M**easurable, **A**cceptable to your participants, **R**ealistic to achieve, **T**ime-bound with a deadline, **E**xtending capabilities and **R**ewarding to learners.

D. Determining the learning objectives and activities

The purpose of this part is to define the learning activities (or methods) which are needed to achieve the learning objectives and overall training goals of your training course.

1. **Identify some preliminary learning objectives for each new area of knowledge or skills that you need to learn.** Carefully consider each of your training course goals. What specifically must be accomplished (that is, what objectives must be reached) in order to reach those goals? Which of these objectives require learning new areas of knowledge or skills? These objectives are

likely to become learning objectives in your training plan. Similar to the nature of training goals, learning objectives should be designed and worded to be Specific, Measurable, Acceptable to your participants, Realistic to achieve, Time-bound with a deadline, Extending capabilities and Rewarding to learners.

2. **In what sequence should the learning objectives be attained?** Usually, learning builds on learning. It may be useful to learn certain areas of knowledge and skills before learning new areas.
3. **Carefully consider – When will your participants have achieved all of your learning objectives, will they indeed have achieved all of the overall training goals?**
4. **What are the best learning activities (methods) for your participants to achieve the learning objectives?** By hearing or listening – this is the group that likes to be lectured to; learning through seeing – these people like information given pictorially; learning by communicating with others; learning by doing – these people need to get their "hands on". What training style will you use? Formal lectures, group exercises, interactive role-play with informative handouts, etc.?
5. **What observable results, or evidence of learning, will your participants produce from their learning activities that can be reviewed for verification of learning?** Some examples could be: case study analyses; workshops, including participants' evaluations; course handouts; final presentations etc.
6. **Who will verify that each of your learning objectives were reached?** Learning should be evaluated by someone who has strong expertise in the areas of knowledge.
7. **Now that you know what activities that will be conducted, think again about any costs that will be needed, e.g., for materials, facilities, etc.** You may want to update the "Budget" section of the template.
8. **How will you handle any ongoing time and stress management issues while implementing the course?** Professional development inherently includes the need for self-development, as well. Therefore, you might consider information on stress management, time management, emotional intelligence etc.

E. Planning implementation of the training plan

The goal of this phase of your planning is to ensure there are no surprises during the implementation your training course.

1. **During your training course, how will you be sure that your participants understand the new information and materials?** Periodically conduct a short test, e.g., everyone once in a while, try

recall the main points of what they just learned. If they are confused, tell the teachers asap.

2. **Will the learning be engaging and enjoyable?**
3. **Are you sure that you'll receive the necessary ongoing feedback, coaching, mentoring, etc., during your training and development activities?**
4. **Where will you get necessary administrative support and materials?**
5. **During implementation, if any changes should be made to your plan, how will they be tracked? How will the plan be redesigned? How will it be communicated and to the right people?**

F. Planning quality control and evaluation of your training plan and experiences

The goal of this phase of your planning is to ensure your plan will indeed meet your training goals in a realistic and efficient manner.

1. **Who is in charge of implementing and tracking your overall plan?** How will you know if the plan is on track or needs to be changed?
2. **Consider having a local training expert review the plan.** The expert can review, in particular, whether – your training goals will provide the results desired by you (and your organization, if applicable), – learning objectives are specific and aligned with your overall training goals, – the best methods are selected for reaching your learning objectives, and – your approach to evaluation is valid and practical.
3. **Are approaches to evaluation included in all phases of your plan?** For example, are your methods being pre-tested before being applied? Do you understand the methods as they are being applied? Are regularly providing feedback about how well your participants understand the materials? How will you (and your supervisor, if applicable) know if implementation of the plan achieves the training goals identified in the plan? Are there any plans for follow-up evaluation, including assessing your results several months after you completed your plan?

Template for course design

FREE

Template – Plan your training course

Title of the course _____

Time frame _____

Start date _____

Completion date _____

Funding requirements _____

(See budget at the end of the training plan)

Overall training goals

What do you want as a result of the learning your participants will achieve from your training course? As much as possible, design your goals to be "SMARTER".

1. _____
2. _____
3. _____
… _____

How were these training goals selected? Results of performance review? Result of assessment? Reference to current job description? Reference to strategic or other organizational goals? Other(s)?

Learning objectives

What new capabilities do you want your course participants to have? You may need several learning objectives for each of your overall training goals. As much as possible, design your learning objectives to be "SMARTER".

1. _____
2. _____
3. _____
… _____

How were these learning objectives selected? Results of performance review? Result of an assessment? Reference to current job description? Reference to strategic or other organizational goals? Other(s)?

Learning activities / strategies / methods

What activities will you undertake to reach the learning objectives? Learning activities may not match learning objectives on a one-for-one basis.

1. _____
2. _____
3. _____
… _____

Who will be your teachers?

1. _____
2. _____
3. _____
… _____

Documentation / Evidence and Evaluation of Learning

Documentation / evidence of learning	Who will evaluate it?	How will they evaluate it?

Who will verify that each of your learning objectives were reached?

1. _____
2. _____
3. _____
… _____

Budget for training plan

The following budget depicts the costs expected to implement this training plan.

Expected Expense	Euros

Template for course evaluation

FREE

Evaluation sheet – Training course PARTICIPANTS (Trainees)

name: _____

place: _____

date: _____

Participants please fill in	4 = excellent; 3 = good; 2 = reasonable; 1 = to be improved; 0 = poor	4	3	2	1	0
Venue, equipment	Suitability of working rooms	___	___	___	___	___
	Quality and suitability of equipment	___	___	___	___	___
	Catering (if applicable)	___	___	___	___	___
Programme	Planning and timescale	___	___	___	___	___
	Balance between lectures (information) and working sessions (participation)	___	___	___	___	___
Content / delivery	Relevancy of content of presentations with regard to the topic and the aims of the training	___	___	___	___	___
	Competence of the speakers	___	___	___	___	___
	Competence of the workshop leaders	___	___	___	___	___
	Inter-activity of the event (needs and expertise of participants are taken into account)	___	___	___	___	___
	Adequacy of working methods	___	___	___	___	___
	Variety of presentation methods	___	___	___	___	___
Materials, resources	Relevancy and quality of the material	___	___	___	___	___
	Variety of sources used for the material	___	___	___	___	___
	Usefulness of the material in your future work	___	___	___	___	___

Impact

Aims:
Did your objectives for coming to this training have been met?

_____

Coverage:
Is there anything else you would like the events to have covered?

_____

Achievements:
What are, according to you, the major achievements of this training initiative?

_____

Suggestions

What to keep next time, what to change next time:

_____

_____

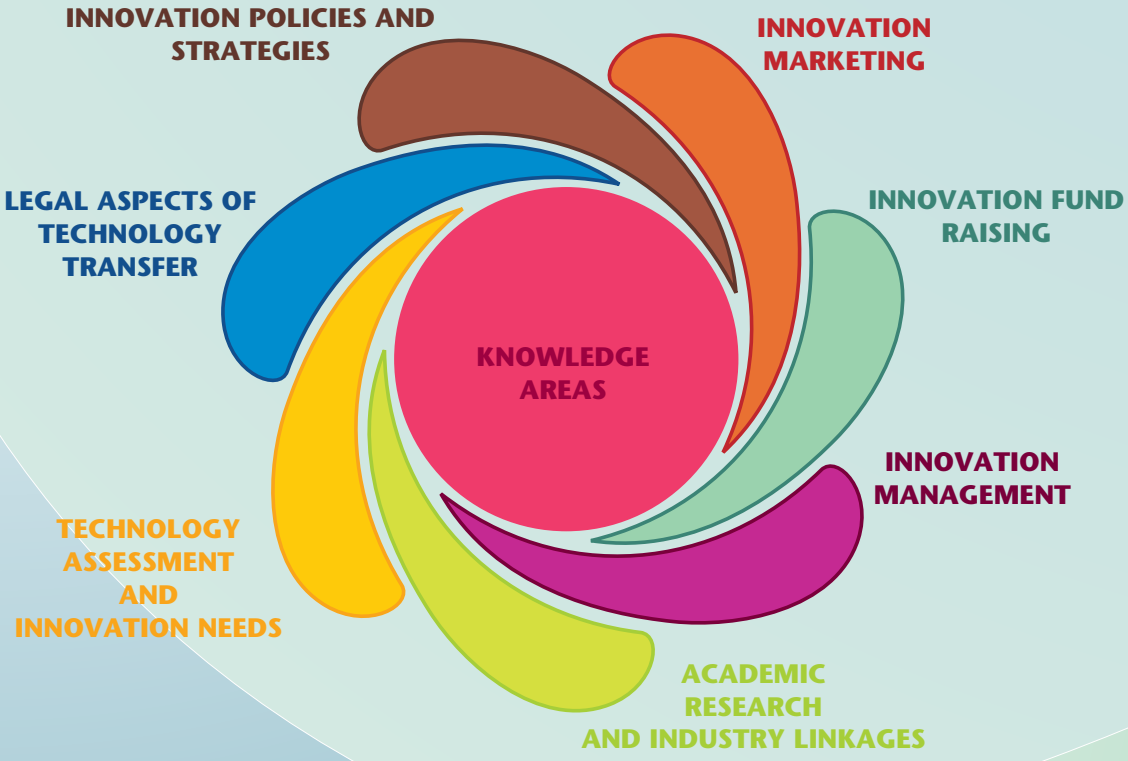
_____

_____

_____
Signature

SECTION 2 – Knowledge Areas

This section attempts to identify the most relevant knowledge areas for our innovation mediators. We reviewed and compared technology transfer activities of forty training courses provided over the last two years in four European member states selected among hundreds of courses. Comparing the training offer according to their training modules (see Section 4) it became evident that they all refer to about 7 macro knowledge areas. Most courses cover more than one knowledge area, while some are dedicated to one key issue. This section shortly introduces the kinds of knowledge that positively influence Innovation transfer. They all represent potential training issues and are a common starting point for effective and appropriate course design.



1. Academic Research and Industry Linkage

According to some authors, there are seventy-two linkages by which professionals from industry and university interface. Generally the major categories University-Industry Research Interactions are:[1]

1. **General Support**
2. **Contract Research**
3. **Research Centres and Institutes**
4. **Research Consortia**
5. **Industrial Associate / Affiliate Programs**
6. **New Business Incubators and Research Parks**

1) General Support

Such support takes the form of monetary gifts and/ or equipment donations for teaching and research purposes.

2) Contract Research

Atlan (1987) indicated that over 50% of industrial support to universities is provided through contracts for special projects. The funding for the individual projects is usually reviewed on a year-by-year basis, and thereby subject to discontinuity.

3) Research Centres and Institutes

In order to facilitate the procedures of contracting and communicating between researchers and industry, some universities establish research centers focusing on a certain technology. Such centres can provide the environment for the cross-disciplinary approach that industrial problems often require (Atlan, 1987).

4) Research Consortia

Research consortia can be characterized as specific mission programs organized to ensure that generic or mission-oriented research will be carried out by one or more universities (Atlan, 1987). Typically, participating companies pay a membership fee; the university offers laboratory space and graduate students and faculty researchers.

5) Industrial Associate / Affiliate Programs

Many research universities set up such programs to provide member firms with access to campus research and resources. Liaison Program.

6) New Business Incubators and Research Parks

Most of research parks and incubators are located on or near the campus and are intended to draw technology-intensive firms into the university environment. Research parks can be beneficial to both university and industry by facilitating interaction and encouraging them to take advantage of each other's resources. The highly

[1] Source: Atlan, Taylan (1987) *Bring Together Industry and University Engineering Schools,* in *Getting More out of R&D and Technology,* The Conference Board, Research Report #904

successful Stanford Industrial Park provides an example for this model. Another way for the university to create an environment conducive to the formation and growth of new technological business s through new business incubators.
Source: Vincent F.-S. Wu (2000)[2]

2. Innovation Management

There are several definitions for innovation management. We opted for the following: "Innovation management is focused on the systematic processes that organizations use to develop new and improved products, services and business processes. It involves harnessing the creative ideas of an organization's employees and utilizing it to bring a steady pipeline of profitable new innovations to the marketplace, quickly and efficiently". Innovation management is a delicate process. Too strong managerial control can even be counterproductive. However nascent field of technology tools that specifically facilitate and improve corporate innovation is just becoming understood.

To get a clearer picture of the concept, we can use some of the following elements:[3]

1 Innovation benefits from a range of perspectives

For most of our industrial history, innovation has been restricted to internal R&D teams. Over the last decades and with the arrival of the Internet more people have a knowledge-based relationship with their employers. Studies show that exposing ideas to a wider range of perspectives significantly improves them. In terms of management, the change both or research institutions and business organisations is elevating the importance of sourcing ideas from throughout the organisation, as well as outside of it.

2 The most damaging words a senior can say to somebody who is advancing an idea is: "forget about it"

Ideas come in various forms and they hit the "inventors" at varying times as they do their work. Sure, a lot of these ideas won't be feasible. But a lot will. The recognition that there is valuable intellectual capital in the ideas that emerge from somebody's knowledge and activities is core to improving corporate innovation.

[2] Vincent F.-S. Wu, *An Empirical Study of University-Industry Research Cooperation – The Case of Taiwan,* article prepared for the workshop of the OECD-NIS Focus Group on Innovation Firm and Networks, Rome, 2–3 October, 2000.

[3] These elements were introduced by Hutch Carpenter in, *What is Innovation,* on-line article on Blogging innovation, October 2009.

3 Create a culture of constant choices

External markets are constantly changing. Organisations that are maintaining a good velocity of ideas are the ones that succeed long-term in industries.

4 Looking at innovation as a discipline

Innovation is a top priority for companies. So how does a company systematically address innovation as a discipline? Companies apply resources and attention to a number of other disciplines: sales, customer relationship management, supply chain management, managerial accounting, etc. Looking at innovation from a similar perspective is emerging as an important strategy. A number of large enterprises have established internal innovation-focused executives. These aren't employees who are supposed to dream up all the ideas. Their work is on establishing innovation as a discipline.

5 Focus on innovation priorities

People all know lot from a variety of activities and interests. For organisations, this wealth of experience is an asset but which ones are most pertinent to the company's or organisation's success in the market?

6 Establishing a common platform for innovation

Consider how people innovate today. You have an idea, what are you going to do with it? Under this system, corporate innovation requires phenomenal acts of heroism to get anything done. Creating the common community space for innovation is a fundamental step forward in how organisations foster innovation.

7 Innovation must be more than purely emergent, disorganized and viral

There is a need to push to raise the awareness of innovation and some organization to channel it where it's needed. Organisations need ways to ensure valuable ideas are caught and surfaced systematically.

3. Innovation Fund Raising

Financing provides the resources that allow the transformation of new ideas into large-scale commercial activities while linking the various actors that make this process possible, through the sharing of risks and rewards. Financing innovation is not only about the availability of financial resources. It is also about skills – to present projects, to assess them and to provide the complementary managerial and technical expertise that is required to nurture emerging innovative

enterprises. It is also about finding a common language that allows communication among different actors and promoting awareness of the various existing alternatives at different phases of the life of a company. Policy efforts are required to provide both the economic environment and the institutional infrastructure that enable and support private activities in this area.

4. Innovation Marketing

Innovation can be either inventing something new or improve something that presently exists, but the one thing that is consistent in both scenarios is the approach needed when marketing it. What counts it to communicate the points that are motivationally relevant to the target audience – not just the points relevant to the innovator. The difficulty is to explain something brand new and often this means innovators and inventors get lost in the detail of the features. Many innovations are not properly understood in terms of their advantages and disadvantages, or their long term effects. Who is in charge with Innovation marketing must find the reason for which somebody will use the innovation and understand how it will be used. The message directed to this user is not an abstract explanation about all features or benefits in a terminology that works for the innovator but the wording should reflect the customers' profile.

5. Technology Assessment and Innovation Needs

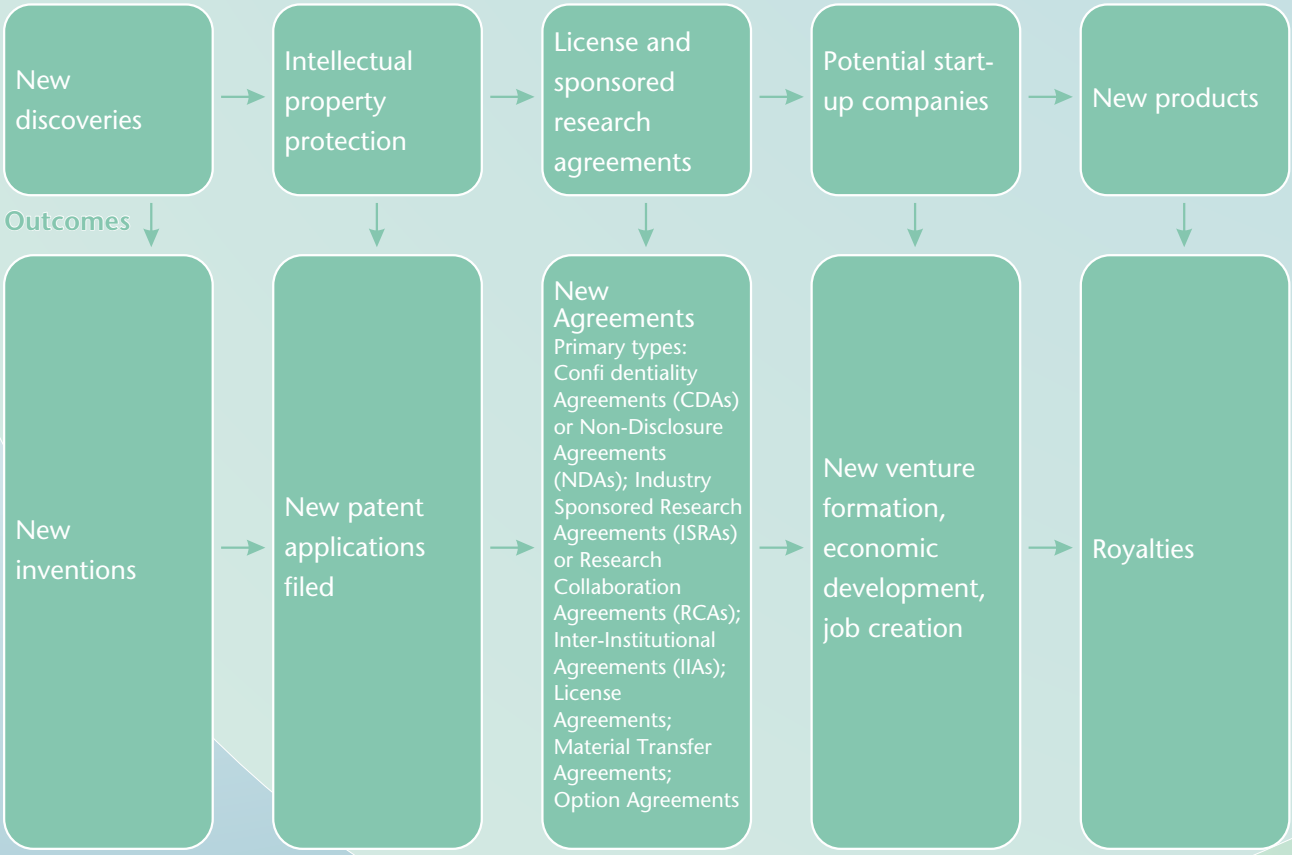
The Innovation Assessment is a way to gain insight in organisations' innovation capabilities, identify short and long term opportunities and define actions accordingly. The actions are aimed at improving the balance between innovation capabilities and ambition, capitalising on the potential and gaining strategic advantage.

Innovation begins (and continues) with "assessment." This assessment examines many different dimensions of innovation and idea management. These dimensions are: Culture, Leadership, People, Processes, Tools & Techniques, Training, Facilities, Idea Capture, Idea Management, Strategic Planning.

6. Legal Aspects of Technology Transfer

There are many legal concerns in the conduct of effective technology transfer. It is not enough to have an innovative idea. To be of value to anyone, good ideas and know-how have to be passed on. Intellectual property protection and licensing related inventions are a problem for researchers and developers in universities and companies alike.

Technology transfer process and its legal implications



7. Innovation Policies and Strategies

EU member states pursue quite different policy-mixes to increase their individual innovation performance. Some states apply tax incentive schemes to stimulate RDI-activities of enterprises, some try to improve the capability of small and medium-sized enterprises to apply new technologies via technology parks and technology transfer offices at universities or technology brokers which serve as contact points for SMEs at extra-university institutes or technology centres.

Other use "Competence Centres" at universities to increase the mobility of scientists between research institutes and the private sector. This scheme works fine in federal states where activities must achieve a balance between a national strategy and regional implementation and are often organised in so-called regional or technological clusters. In sum, in Europe technology and innovation policies exist at various territorial levels endowing this policy area with a multi-level character.[4]

[4] For a complete overview see Heiko Prange, *Technology and Innovation Policies in the European System of Multi-Level Governance,* in *Technikfolgenabschätzung,* Nr. 2, 12, June 2003.

SECTION 3 – Key Skills

To further define the role and key skills of innovation intermediaries, we borrowed insights from the CERT-TTT-M project. CERT-TTT-M stands for "Certified Transnational Technology Transfer Manager". It is the first European project, which created an inventory of skills and competences needed for technology transfer professionals. The development of the inventory took two years (Jan. 07 to Feb. 09) and resulted from and extensive consultation process involving all 25 Member States. In order not to double efforts and exploit already available research results, we decided to transfer this training framework to FREE as a best practice.

The experience of CERT-TTT-M project

Key skills are the skills that you need in order to operate confidently and successfully in your work. The key skills we would like to suggest for the training of our innovation mediators were identified within the project entitled CERT-TTT-M. The acronym stands for *Certified Transnational Technology Transfer Manager.*[5] The consortium involved within this FP6 project was made up by:

- Austria Wirtschaftsservice GmbH (Co-ordinator) – Austria
- ASTER S. Cons. P.a. – Science Technology and Business – Italy
- Department for Productive Activities, Economic Development and Telematics Plan of
- Emilia-Romagna Region – Italy
- Institute Européen Entreprise et Propriété Intellectuelle – France
- Institute for the Promotion of Innovation by Science and Technology in Flanders – Belgium
- Management Center Innsbruck – Austria
- Ministère délégué à l'Enseignement supérieur et à la Recherche – France
- Ministerie van Economische Zaken – The Netherlands
- Rotterdam School of Management Erasmus University – The Netherlands
- State Agency Latvian Investment and Development Agency – Latvia
- Swedish Governmental Agency for Innovation Systems – Sweden

[5] © Consortium of CERT-TTT-M, 2008

Background information

The aim of the Cert-TTT-M Training Framework was to support training providers for the design and the implementation of training courses for the career development of technology transfer professionals. As you can see, the purpose is exactly in line with the objectives of FREE.

The Training Framework is based on the results of several surveys conducted within the CERT-TTT-M project on training needs and opinions expressed by professionals and experts. As in the FREE project, an analysis of training programmes available in technology transfer throughout Europe was carried out to further investigate. Detailed information on all surveys conducted is available on the project website: http://www.ttt-manager.eu

If we compare the two course analyses (the one conducted within FREE and the one carried out by CERT-TTT-M) it becomes evident that the surveys conducted at a two year distance come to very similar results with different levels of definition (see table at the next page). Whereas CERTTT-M inventoried skills for Technology transfer professionals, FREE is restricted to the definition of a body of knowledge as an important building block in professionalization courses (see table below).

The most **salient skills** according to **CERTTT-M**	The **core knowledge areas** according to **FREE**
Commercial awareness – **Commercial Activities and Markets**	Innovation marketing
Communication skills – **Managing Communication, Information and Networking**	
Networking	Academic Research and Industry Linkage
New Business development – Project management	Innovation fundraising – Innovation management
Negotiation	Innovation policies and strategies
Legal knowledge – **Understanding IPR & Licensing**	Legal aspects of technology transfer
Industry specific expertise – **Information analysis**	Technology Assessment and innovation needs

In the next pages **we summarise the CERT-TTT-M Framework** based on the project official documents provided by the CERT-TTT-M Consortium:

1. Letter of Intent for Training Providers
2. ANNEX 1 Quality Criteria for Training Providers
3. ANNEX 2 The Framework & Curriculum TP.

A set **of seven professional skills** has been identified within the CERT-TTT-M project as strategic for people who want to work as professionals in the technology transfer field at European level.

1. Managing Communication, Information and Networking
2. Understanding IPR & Licensing
3. Commercial Activities and Markets
4. New Business Development
5. Negotiating
6. Project management
7. Information analysis

For each of the seven skills **one training module** was developed.

Each module is detailed in relation to three education levels.

Several criteria are used to describe each module:

- Title
- General description of the module's aims
- Learning outcomes
- Levels of education
- Education modules
- Methodologies
- Facilities
- Teaching staff
- Assessment
- Duration *(minimum of time the student spend to physically attend the classes. It doesn't include the time to prepare for the classes and/or time for assignments)*

The three education levels:

- **Basic** – should be focused on learning the basics in technology transfer (for example 'What is IP-law'). This level is a 'knowledge level', preferred teaching method is classroom teaching.
- **Advanced** – could be focused on more in-depth, strategic and specialized issues, developing more skills, supported by classroom teaching, interactivity, case studies and e-learning.
- **Expert** – is the level where knowledge and skills become integrated in an optimal way. Teaching methods could be based on business-cases where all dimensions of technology transfer come into play.

Modularisation and duration

As a whole, the Framework represents a sort of ideal curriculum for the education of professionals. It means that a training programme **could include all the modules or only a part of them.** In fact each module at a certain level has to be intended as self-sustained and could represent the basis for one single course by itself. For example, a course could be implemented in order to develop a specific skill – (New Business Development) on a certain level (Basic).

The modularisation of education is possible for the Basic and the Advanced level while it is not advisable for the Expert level. The Expert level is set up to follow as one total module where all skills are used. The skills on the Expert level are taught with the

assistance of a business case in which all knowledge, skills and competences of candidates come together.

Another point of attention for the curriculum refers to the optimal length of an education programme, as the target group is represented by professionals. According to the survey developed within the previous project, **the ideal length of an education program is 1–3 weeks (50% of the respondents). A length of 1–4 weeks (5–20 working days) was optimal regarding 64.9% of the respondents.** On this basis, each module of the Framework should have a minimum duration of 2 or 3 days: time for self study and time to make assignments is not counted. The whole programme (7 modules) should last around 14 days.

Professional titles

The Training Framework proposes professional titles distinguished for the three education levels:

- Basic: *Technology Transfer Professional (TTP)*
- Advanced: *Senior Technology Transfer Professional (STTP)*
- Expert: *Executive Technology Transfer Professional (ETTP)*

A candidate can be awarded the professional title TTP, ATTP or ETTP if he/she has mastered all different elements of the relevant level, which is shown by passing the exam. In the table below an idea of what a basic / advanced / expert level means and what candidates are supposed to know and do is presented.

Levels, titles and activities of technology transfer professionals

Level	Title	Description	Activities / roles
Basic 0–3 years experience	Technology Transfer Professionals TM	Has general knowledge of all seven skills	Assistant TT manager, Project Assistant
Advanced 3–8 years experience	Senior Technology Transfer Professional	Has deep knowledge of all seven skills and has knowledge and the experience in all the methods of technology transfer and conditions of application and several years of personal experience from participation in (projects in technology transfer.	Project manager, managing technology transfer or innovation projects along at least one of the recognized lines of technology transfer

Level	Title	Description	Activities / roles
Expert > 8 years experience	Executive Technology transfer Professional	Has profound knowledge and experience in all methods of technology transfer and conditions of application and an extensive and systematic personal experience from the management of projects in some fields of TT. A senior technology transfer professional is able to able to manage and to exploit large Technology Transfer Processes and is able to manage a TT professional team. He or she should have track of several successful spin-offs of licensing deals.	TTO manager, TT manager, supervising Technology Transfer, and managing very complex structured projects along at least one of recognized lines of technology transfer.

The CERT-TTT-M Training Framework for Technology Transfer Professionals[6]

The Training Framework gives information and guidelines on different education modules. The modules described are seven, one for each of the skills identified. Each module is detailed in relation to three education levels.

Certified TTT-Manager
FP6 RTD OMC-NET

Managing communication, information and networking

The purpose of this module is to develop the skills of candidates in communication, information and networking skills in an effective manner to realise TT matters.

BASIC

Learning outcomes

Candidates must be able: • Students must have basic communication skills (to listen, to summarise, to question, to present, non-verbal and verbal communication, to write) • To know the different levels of communication in a conversation (contents, procedures, interaction and emotion) • To know the basic theories of communication • To find, interpret and use relevant information from the database (like markets, industries) • Basic understanding of information management in TT • Knowledge of existing relevant TT stakeholders (national and international, e.g. regional development agencies, government, TT networks etc.) • To be able to benefit from interaction in these TT stakeholders

Modules

Introduction communication theory (classroom) • Communication skills (classroom / role playing) • Basic information management • TT-networks, how to find, use and build personal networks for own organisations (class room)

Methodologies

Classroom teaching • Role playing • e-learning

Facilities

Classroom • ICT

Teaching Staff

Communication expert • TT-expert • Database searcher

Assessment

Exam

[6] © Consortium of CERT-TTT-M, 2008 – http://www.ttt-manager.eu/download/ANNEX %202_The %20Framework %20& %20 Curriculum_TP.pdf

Managing communication, information and networking

The purpose of this module is to develop the skills of candidates in communication, information and networking. After this module candidates will be able to use communication information and networking skills in an effective manner to realise TT matters.

ADVANCED

Learning outcomes

Candidates must be able: • To manage a meeting / workshop • To manage external communication providers • To advise on TT matters • To communicate effectively on different hierarchical levels, with people from different backgrounds (technical, legal, research background) • To devise the communication strategy related to the commercial strategy • To articulate the technology transfer objectives for the commercial portfolio of the organisation • To manage the information flow from the different projects he/she is involved • To build up a network and build up relationships with important contacts within networks • To coordinate or manage a network • To maintain relevant networks and to be able to use them fro the benefits of the project

Modules

Advisory skills • Communication skills (advanced) • Managing information flow • Building and maintaining a network

Methodologies

Action learning, case studies, role playing • Present results of the case study to relevant stakeholders • e-learning (working in virtual project environments) • classroom (information management)

Facilities

Classroom • ICT

Teaching Staff

Senior communication trainer • Information manager

Assessment

Case study

Understanding IP rights and licensing

The purpose of this module is to give candidates knowledge and insight into IP rights, licensing, legislation and practical and commercial implications of legal issues concerning technology transfer and business development.

Learning outcomes

Knowledge of IP rights • Introductory knowledge of legal issues related to research in general • Introduction to basic agreements (license, funding and collaboration agreement, NDA, MTA, options, evaluation agreements, etc.) • Understanding the commercial strategies related to the above agreements • Basic understanding and use of patent-databases

Modules

B IP – legislation (national and international) • IP and contractual issues arising from research funding
A • Overview of IP matters in exploitation and Technology Transfer • Agreements • Licensing
S **Methodologies**
I Courses • Case studies
C **Facilities**

Classroom

Teaching Staff

Teacher with working experience in IPR in TT-field (lawyer, industry expert, academic teacher) • TT professionals

Assessment

Exam

Understanding IP rights and licensing

The purpose of this module is to give candidates knowledge and insight into IP rights, licensing, legislation and practical and commercial implications of legal issues concerning technology transfer and business development.

ADVANCED

Learning outcomes

Candidates must know / be able to: • Legal aspects of: 1. contract research, 2. protection and exploitation of research results, 3. spin-off creation, 4. licensing • Oversee all practical implications of legal issues concerning technology transfer / business development • The different kind of contracts • Exploitation strategies (contract research, IP protection and licensing, due diligence research, spin-off creation, financing • Design an IP-strategy within a given budget • About IP protection and defence (enforcement and infringement, alternatives to litigation e.g. ADR) • Oversee tax implications of new contracts • Manage the evaluation process of the IP • IP contracts maintenance (including auditing and policy royalties) • Awareness of patentability exclusions, bio-tech patents CII-patents

Modules

Legal aspects and contracts • Exploitation strategies • Portfoglio management

Methodologies

Workshops • Courses • Case studies

Facilities

Classroom

Teaching Staff

Teacher with working experience in IPR in TT-field (lawyer, industry expert, academic teacher) • TT professionals • IP experts

Assessment

Case study

Commercial activities and markets

The purpose of this module is to give candidates the commercial knowledge and skills to be able to detect the possibilities for commercialisation and take the necessary steps to develop commercialisation

BASIC

Learning outcomes
Candidates must have • Insight into the commercial viability of technology • Knowledge of the business environment • Understanding of the importance of markets and their segmentation • Knowledge of the value of IP and technology and how to exploit them best • Knowledge of the legal issues concerning commercialisation

Modules
Value and audit IP • Channels of exploitation, business models and business planning • Legal issues concerning commercialisation

Methodologies
Courses

Facilities
Classroom

Teaching Staff
Staff specialised in the commercialisation of technology

Assessment
Exam

ADVANCED

Learning outcomes
How to push technology through business development far enough for it to be pulled by the market • How to get access to potential partners / investors • How to market technology • To understand the possible markets

Modules
Product development • Technology marketing • Market specific knowledge • Envisioning and designing products / services from technology

Methodologies
Courses • Case research

Facilities
Classroom

Teaching Staff
Staff experienced in the commercialisation of technology

Assessment
Case study

New business development

TT professionals should be able to demonstrate their ability to identify hitherto unexploited sources of expertise and technology within their institution and to add substantial value to the opportunity of involving and motivating academics, identifying potential partners, identifying sources of strategic funding, shaping the business model and, in collaboration with the other TT functions, conclude deals that provide substantial economic benefit (and thus new funding to the institution). In addition to their own portfolio, professionals must demonstrate the ability to develop the business development skills of others by mentoring, teaching or publications.

Learning outcomes

Candidates must know: • About methods and for market and industry research • About the relevant financing instruments (subsidies, business angels, venture capital funds, IPO etc.) • How to develop a business model and commercial strategy • Understanding of business plan and components • The legal aspects (choice of legal company forms & IP relate contracts) • Methods in building teams with the right mix of skills and experience

B A S I C

Modules

Finance I • Strategies for commercialising new technologies • Elements of business plan • Building teams

Methodologies

Courses

Facilities

Classroom

Teaching Staff

Experience business developer or advisor in business development

Assessment

Exam

New business development

TT professionals should be able to demonstrate their ability to identify hitherto unexploited sources of expertise and technology within their institution and to add substantial value to the opportunity of involving and motivating academics, identifying potential partners, identifying sources of strategic funding, shaping the business model and, in collaboration with the other TT functions, conclude deals that provide substantial economic benefit (and thus new funding to the institution). In addition to their own portfolio, professionals must demonstrate the ability to develop the business development skills of others by mentoring, teaching or publications.

ADVANCED

Learning outcomes

Candidates must be able: • To valuate tangible and non-tangible assets • To assess / evaluate business opportunities for optimal route to the market • To identify & persuade investors / management by e.g. presentations & discussions • To form strategic partnerships (e.g. joint ventures) • To be able to deliver a business plan • To raise the funds appropriate to the profile & scale of an opportunity • To strategically use development funds (private sector, public sector, internal funds)

Modules

Market Entry Strategy • Tactics in identifying and persuading Investors • Business opportunities • Investor relationships and strategic partnerships • Finance II (define and realise financial sources for technology transfer) • Develop a business plan

Methodologies

Courses • Case study in a small group about financing

Facilities

Classroom

Teaching Staff

Experienced business developer or advisor in business development or investors

Assessment

Case study

Negotiating

The purpose of this module is to teach candidates the skills of negotiation, from being able to understand it up to developing a negotiation strategy and acting as the main negotiater in a complex negotiation process.

Learning outcomes

Candidates must be able: • To identify the process & content in negotiations • To recognise the different styles of negotiations • To recognise the cultural and human factors affecting negotiations • To recognise the factors that lead to successful negotiations

Modules

BASIC

The negotiation process • The content of negotiations • Negotiation styles • Cultural and human factors in negotiations • Achieving success in negotiations

Methodologies

Course • Mini group seminars (case studies)

Facilities

Class room

Teaching Staff

Negotiation trainer

Assessment

Exam (case analysis)

Learning outcomes

Candidates must be able: • To critically assess the theory and practice of negotiations • To develop a framework that matches negotiation styles with specific scenarios in the filed • To analyse the organisation negotiation strategy and to highlight its strengths and weaknesses

Modules

ADVANCED

Revisiting theory and practice on basis of complex case • Examining negotiation in practice: role playing on basis of complex scenario • Analysing negotiating strategy of student's and other organisation is specific case (e-learning)

Methodologies

Interactive: 1 day • E-learning (analysing negotiating strategy of firm in specific case)

Facilities

Class room width videocamera • ICTs

Teaching Staff

Experienced business negotiator

Assessment

2000–3000 word assignment (4/5 sides)

Project management

The purpose of this module is teach candidates about project management

BASIC

Learning outcomes

Candidates must know: • How to define an assignment and results of a project • How to plan, know the different project phases • The different project factors: time, budget, quality, information, organisation • How to write a project plan • How to do a risk analysis

Modules

Project management: the basics

Methodologies

Course

Facilities

Class room

Teaching Staff

Specialist in project management

Assessment

Exam

ADVANCED

Learning outcomes

Candidates must be able / have: • To deal with the tasks and responsibilities of a TT-project leader (TT process as a project) • Insight in leadership, communication processes, cooperation and conflict management • To organise TT projects / process • To plan a budget • To manage discontinuities and contractual relations • To manage the research teams • To manage internal TT responsibles

Modules

Effective management and leadership • Personal qualities project leadership • Cooperation, communication, coaching and conflict management within a team • Planning and budgeting • Management external stakeholders (lawyers, contracting parties…)

Methodologies

Course • Practising and role play

Facilities

Class room

Teaching Staff

Specialist in project management & TT/IPR management

Assessment

Write a project plan

Information analysis

Successful IT professionals must be aware of the diverse sources of IP, academic, technical, business and market information which can affect business decisions.They need to be familiar with patent database and other IP, academic, technical and business information databases, and know-how to analyse the information they retrieve.

BASIC

Learning outcomes

Candidates must have: • Knowledge of commonly used patent databases (free and commercial) • Knowledge of sources of patent search help • Knowledge of patent classification schemes • Knowledge of trademarks and design databases • Ability to perform market and industry research • Knowledge of non-patent literature and information sources. E.g. academic / technical journals

Modules

Overview of patent information and sources of advice, introduction to other public patent databases (e.g. USPTO,JPO, SIPO, Derwent, STN), esp@cenet – the free access internet patent database of the EPO • How to read a patent (understanding what the document is telling you) • Classification I – IPC & ECLA • Introduction to trade mark and design databases (e.g. OHIM) • Introduction to business information databases and market and industry research • Introduction to non-patent literature and information sources, e.g. academic / technical journals

Methodologies

Courses – hands-on exercise on the pc

Facilities

Classroom (PC teaching laboratory)

Teaching Staff

Experienced database searcher

Assessment

Exam

Information analysis

Successful IT professionals must be aware of the diverse sources of IP, academic, technical, business and market information which can affect business decisions. They need to be familiar with patent database and other IP, academic, technical and business information databases, and know-how to analyse the information they retrieve.

ADVANCED

Learning outcomes

Candidates must have: • Knowledge of US and Japanese patent classification schemes • Knowledge of East Asian sources of patent information • Ability to use patent information to inform business decision making • Ability to use non-patent information sources to inform business decision-making • More sophisticated market and industry research techniques • Knowledge of the different type of patent search, e.g. novelty, validity, state of the art, freedom to operate, infringement

Modules

Patent classification II – US schemes, Japanese scheme • Advanced search strategies • Searching USPTO database • Searching East Asian patent database (China, Korea Japan) • Using patent information to inform business decisions, "patent-mapping" • Advanced market and industry research techniques

Methodologies

Problem solving exercise • Courses hands-on • Case study

Facilities

Classroom (PC teaching laboratory)

Teaching Staff

Experienced database searcher • TT professionals • Patent database searcher

Assessment

Exam

EXPERT LEVEL

Managing communication, information and networking

Learning outcomes
Candidates must be able: • To manage all different forms of communication, (crisis, intercultural, project…) • To interlink information from different fields, extrapolate trends and conclusions that have impact for the strategic level for the organisation

IP rights & licensing

Learning outcomes
Candidates must be able: • To make / validate policy proposals of IP strategy ad exploitation • To IP asset management

Commercial activities and markets

Learning outcomes
Candidates must be able: • To manage and evaluate the explosure to risk regarding the whole asset base for their organisation • To manage their KTO/TTP – personnel and resources to achieve desired outcome

New Business development

Learning outcomes
Candidates must be able: • To bring ideas to the market as leader of an entrepreneurial team • To optimise a business plan suitable for substantial investment (target group oriented) • To take the lead on innovation and growth management • To convince investors and the management by prospectus (a complex illustration of a business case)

Negotiation

Learning outcomes
Candidates must be able: • To redefine the notion of success and best practice in negotiation • To act as a mentor of a newcomer in your firm: observe and monitor change • To redesign your firm's negotiation strategy: drive change • To act as a main negotiater in TT processes • T act as a leading negotiator in a complex scenario that involves challenging cultural and human factors

Project management

Learning outcomes
Candidates must be able: • To manage complex TT projects with large budgets in complex project circumstances • To perform a TT due diligence (covering the whole TT process)

EXPERT LEVEL

Information analysis

Learning outcomes

Candidates must be able: • To gather all relevant information from a range of sources which impact the development of a project • Produce a comprehensive analytical report based on the gathered information

Methodologies

Development of a joint business case with fellow students, which will be presented to a panel of peers and evaluated by them

Facilities

Seminar / round table arrangement

Teaching staff

Experienced peers from different TT stakeholders

Assessment

Presentation (and defence) of business case to panel to peers

The following items represent a list of characteristics required by training providers who could implement and provide courses based on the Training Framework developed by the CERT-TTT-M project. Such characteristics are intended to be basic and general quality requirements of institutions providing education and training programmes.

Quality criteria for training providers: checklist[7]

The institution, or a subject to which the institution is legally affiliated, is expected to:

1. Provide quality education and training programmes in technology transfer, IPR and innovation management, also by maintaining contacts with (or be integrated in) the networks of stakeholders in the field.
2. Have a track record of provision of courses in technology transfer, IPR and innovation management over at least the last 2 years.
3. Engage adequate numbers and calibre of teaching staff, including experts with professional and commercial experiences where appropriate.
4. Have the provision of education and training courses as a clear goal of the organisation or of specific departments / sections of the organisation.
5. Be recognised as a provider of education and training programmes by qualified public and/ or private authorities at local, national and/or transnational level or to represent itself a relevant authority in professional field, aiming to support professional development also through the provision of education and training opportunities.
6. Provide courses within higher education and/or continuing training for working adults seeking personal and professional development.
7. Be able to demonstrate the clear use of learning outcomes in the design and delivery of their courses and be able to demonstrate processes whereby they take feedback from course participants into account in the design and delivery of courses.
8. Ensure adequate resources and facilities to support the provision of quality courses.
9. Ensure the application of adequate assessment procedures, following clear and public criteria.
10. Publish up to date, impartial and objective information about the programmes and awards offered where appropriate. Apply and/ or refer to European standards and tools for

[7] © Consortium of CERT-TTT-M, 2008 http://www.ttt-manager.eu/download/ANNEX %201_Quality %20Criteria %20for %20Training %20Providers.pdf

transparency while developing education and training courses (for example ECTS system, EQF, Europass Diploma Supplement, Europass Certification Supplement) where appropriate.

Training providers interested in adopting the Framework are invited to get in contact with the Consortium CERT-TTT-M. A model of letter of intent is available on the website.

Certification and accreditation

A first pathway for the accreditation of training programmes and the recognition of professional titles has been defined by the CERT-TTT-M project, recommending to set up a European organisation in TT:

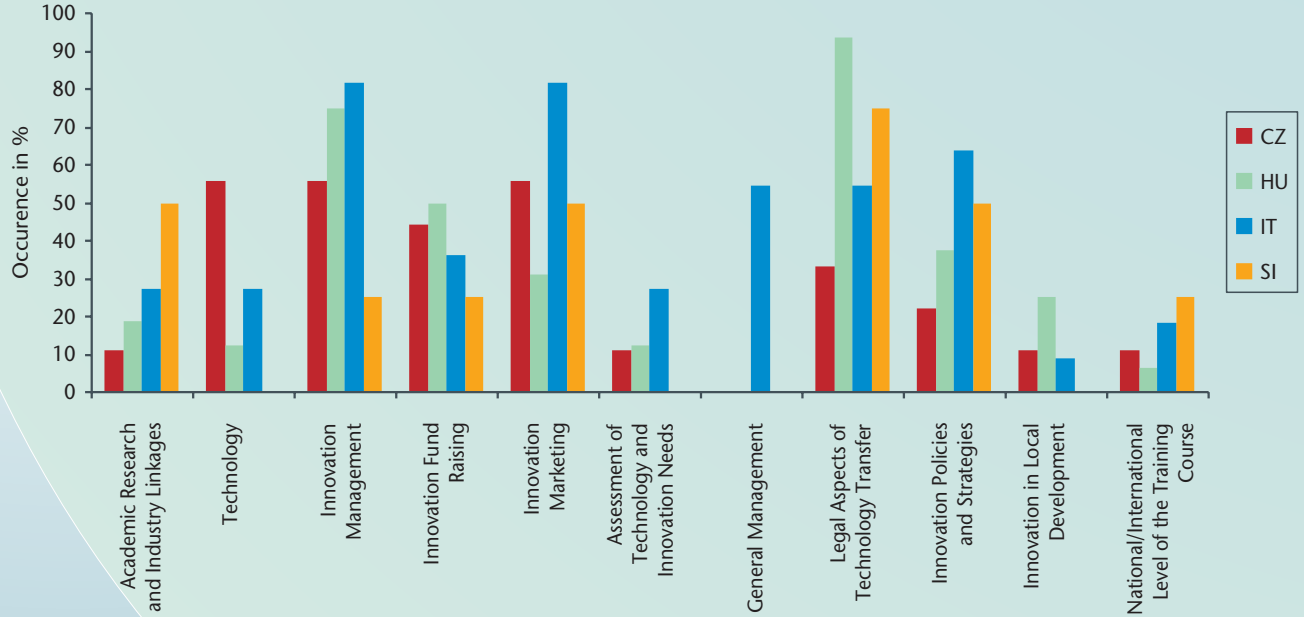
- ensuring quality standards
- providing recognition procedures
- coordinating initiatives
- representing the European authority in the field

On this basis a new two-years project has started in 2010, EUKTS – European Knowledge Transfer Society (FP7 RTD OMC-NET), with the aim to designing the model and the roadmap for setting-up a European-based organisation ensuring quality in knowledge transfer professional field and supporting R&D policy within the ERA.

Further informations are available on www.eukts.eu

SECTION 4 – Training Courses Analysis

We screened 40 training programs for innovation-supporting professionals delivered over the last years in the Czech Republic, Italy, Hungary and Slovenia. The review was conducted with the contribution of all project partners. Chart 1 shows the principal training topics and the percentage with which these topics occur in the different national training programs.



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