Content

Funding / Financing of R&D-projects

Basics

In order to minimize the risks of research activities (especially for the SME) the financial support with public fundings can motivate small and medium organizations to develope ideas and carry them out. Compared with big corporations for most of the SME the different fundings are not transparent. It´s quite sophisticated to get the overview about all possibilities, to keep updated and to decide which funding is appropriate for the specific project / activity. Additionally, every call (european, national or regional level) changes in terms of the needs / requirements which are necessary to get the assignment of a public funding.
Common SMEs have not the network contacts to public and private investors. They need a consulting office which can select the right funding for the right project / intention (for example CATT supports the enterprises in Upper Austria concerning these issues).
Almost every public funding in the field of R&D has the focus on a specific target group or in other words on specific research stages. Some funding-instruments are designed for basic research, other ones for applied research and so on.
In many cases, the missing economic exploitation is the reason why R&D-project proposals get a negative answer in line with the evaluation process.The public funding bodies aim to realize with the assigned funding that the recipients create with this money sustainable products and services.
Without the support of public funding, most of the SME are not willing to take 100% of the risks and this fact leads to the bad situation that a lot of SMEs have on the one hand great ideas but are on the other hand not willing to take the risks of the research-activities. A well implemented risk management combined with up-to-date knowledge of the funding possibilities are the pre-conditions for the generation of successful research-projects.

The main objectives of FP7: Specific programmes

FP7 is the short name for the Seventh Framework Programme for Research and Technological Development. This is the EU's main instrument for funding research in

Europe and it will run from 2007-2013. FP7 is also designed to respond to Europe's employment needs, competitiveness and quality of life.
The ' knowledge triangle' - research, education and innovation - is a core factor in European efforts to meet the ambitious Lisbon goals. Numerous programmes, initiatives and support measures are carried out at EU level in support of knowledge.
The Seventh Framework Programme (FP7) bundles all research-related EU initiatives together under a common roof playing a crucial role in reaching the goals of growth, competitiveness and employment; along with a new Competitiveness and Innovation Framework Programme (CIP), Education and Training programmes, and Structural and Cohesion Funds for regional convergence and competitiveness. It is also a key pillar for the European Research Area (ERA).
The broad objectives of FP7 have been grouped into four categories: Cooperation, Ideas, People and Capacities. For each type of objective, there is a specific programme corresponding to the main areas of EU research policy. All specific programmes work together to promote and encourage the creation of European poles of (scientific) excellence.
The non-nuclear research activities of the Joint Research Centre (JRC) are grouped under a specific programme with individual budget allocation.

Interactions with other innovation topics

Some general hints which are important during the application process for fundings:

- Proof the novelty of the research target
- Schedule the periode for generating the application
- Prepare the application carefully aligned with the specifications of the call
- Set up a powerful project team with cooperative and committed organizations
- Almost every R&D-project lasts at least 2-3 years or longer – this means that you have to set up a project team in which every project partner has the same strategy targets over the whole project periode and beyond.

Continuative informations / links / etc.

Links to European fundings with the focus of R&D-projects:

http://cordis.europa.eu/home_en.html

http://ec.europa.eu/research/fp7/index_en.cfm

http://ec.europa.eu/cip/

http://ec.europa.eu/environment/eco-innovation/index_en.htm

Cooperations

Basics

Cooperation is an efficiency measure doing innovation cost and time saving. The involved parties both have need for a similar resource and find commercial benefits in sharing resources (financial, human resources, equipment, know-how,...)

Reasons for cooperation:

- Lack of resources (personnel, financial)
- Cost reduction
- Risk minimization
- Acceleration of development processes

With whom you can cooperate:

- Research institutions (University, Technical College, Non-university research)
- Other enterprises from a different branch
- Competitors
- Service providers
- Consultants
- National/International

Following questions are relevant for this topic:

We are familiar with relevant network organizations (clusters, experts, technology transfer)	☐	☐	☐	☐	☐

→ Use your existing network to find a partner

→ Use networking services for partner search.

- Regional network: Cluster
- International network: Enterprise Europe Network

→ Define a contact person in your company for your partner

→ If you are cooperate with a partner from abroad, pay attention to cultural differences

We participate regularly in events, fairs and lectures in order to extend our international partners	☐	☐	☐	☐	☐

→ Build up a network by attending events

→ Obtain information about relevant events form your consultant (cluster, EEN,...)

→ Disseminate information you get at an event in your company

In innovation projects our company cooperates with domestic and/or foreign **R&D institutions**	☐	☐	☐	☐	☐

In innovation projects our company cooperates with domestic and/or foreign **companies**	☐	☐	☐	☐	☐

→ Be sure, that you are able to handle a cooperation with a partner from abroad (language skills, cultural understanding,...)

→ Be informed what kind of fundings and financial support you can obtain

→ User your network (Cluster, Enterprise Europe Network) for effective and efficient partner search.

Interactions with other innovation topics

Cooperation is in interaction with all other innovation topics.
Use the knowledge of your partners as a source of knowledge and ideas.
There are a lot of fundings if you are cooperate with partners (regional and international).
You need adequate personal resources to handle a cooperation.
Your partner can help you to make you innovation economically successful.

Continuative informations / links / etc.

Enterprise Europe Network
http://www.enterprise-europe-network.ec.europa.eu/index_en.htm

Economic Success & Innovation Management

Innovation **is fundamental to economic growth and development.**
The ability to create economic value by introducing new products to the market, redesigning production processes, or reconfiguring organizational practices is critical to competitive advantage and growth for firms, industries and countries. The question then becomes how to best organize resources to create, diffuse and sustain innovation and, moreover, how to leverage investments made in science and technology, research and development and related capabilities with the ultimate goal of reaping rewards in terms of wealth creation and increased standards of living.

Innovation and free-trade economy
Before analysing the very concept of innovation, let's outline the general frame in which innovation production and diffusion take place. What are the different ingredients composing a market? According to Porter's forces well-known model the market is governed by five major forces:

- Buyers: Towards them must be oriented all the efforts of the firm, particularly concerning modifications of switching costs, manufacturing processes, or the positioning of the products and services.
- Suppliers must also be taken into account. Because of their huge power of negotiation, they are able to weigh dull as far as supplying is concerned.
- Firms must pay attention to the threat of substitutes, and to the fact that followers do not have to support the R&D costs in the production process, and thus are able to implement the innovative service or product at a lower cost.
- Playing a great role in the innovation environment is that of entry or exit barriers. Anticipating and managing if necessary the different entry and exit barriers should be one of the major preoccupations of the firms operating on the market.
- Rivalry among competitors has numerous consequences on the level of activity, as well as on the value chain, by increasing or lowering one or several structural elements of the market.

Current trends

It is important to be aware of current economic trends as far as production and diffusion of innovations are concerned for a better understanding of the phenomenon. It seems managers have to cope with three major trends nowadays:

- The first one is the growing environmental pressure, due to the increasing competition in the business sphere. Globalization process is one of the explanations of this evolution.
- The second trend is related to the time compression, between invention and innovation (i.e. invention plus commercialization). On the one hand, firms are faster and faster to create innovations, and on the other hand the speed of innovations adoption time is getting less and less long.
- Thirdly, the number of new products or services directed towards consumers increases by 11% each years.

In general the innovation process has to deal with the more and more global shape of the environment, the need for fast life cycle innovations, and the interdependence of research and business institutions.

Market Strategy

After the phase of creation, new products have to be adopted by consumers. This adoption process relies on a life cycle, composed of various stages (knowledge, attitude, decision, implementation, confirmation). To benefit from the products life cycle, innovating firms have to pay attention to the diffusion of innovations. Mainstream users have a stronger perception of the risk involved by innovation. After early buyers have purchased the product or the service, different phases take place: the Bowling alley (i.e. the product become popular), the main stream, characterized by a mass-purchase, and the end of life. Of course, for one product exists one typical product life cycle.

To anticipate these evolutions, companies must decide in favour of a high reactivity in the processes of design (the products that innovate clearly must do quickly to satisfy the needs of the consumers), a simultaneous engineering (project groups), to

increase reactivity and an incremental development to foresee the future of the products.

Knowledge management

Knowledge Management includes creation, production and diffusion of innovations. This kind of management is quite new, and considers the whole value created by a firm relies on its capacity to manage mobile assets, more particularly knowledge. Many people think the term “Knowledge Management“ is an oxymoron as you cannot manage knowledge. Well you clearly can manage some aspects of knowledge. You can manage explicit knowledge captured on paper and in electronic databases in the same way you can manage information. But the term management is inappropriate in its relation to tacit knowledge. Here knowledge management - in its creative sense - is more about nurturing than managing. It is more organic than mechanistic.

Relevant Questions referring economic success:

Our new or improved products penetrate the market better than those of our competitors	☐	☐	☐	☐	☐

To establish a profitable strategy, managers have to choose in which direction they want to gain a competitive advantage on competitors by creating value. For that, companies must determine three main positionings:

- The choices of products and services offered to the consumer
- Technical and economical choices related to the conception, supplying, production, distribution of these products and services.
- The choices of organization and information system adapted to this general frame.

New products & services have achieved a significant share of turnover	☐	☐	☐	☐	☐

- The new products & services are an important part of the company.
- Consumers can identify with the new products and services
- New products & services have established an important part of the market

	1	2	3	4	5
All our products are state of the art	☐	☐	☐	☐	☐
Our manufacturing equipment is superior to that of our competitors	☐	☐	☐	☐	☐
Both our manufacturing processes and our services are state of the art	○	○	○	○	○

- Scientists and engineers have to be occupied with inventing new technological ideas for the products & manufacturing equipments
- Important questions referring to new products:
  - How well will the new product perform?
  - Will a high performance be attained, but only at a prohibitively high cost?
  - How rapidly will performance improve and how rapidly is the cost of production likely to decline?
  - Finally, how soon will a new and superior product come along, either from a competitor or from the introduction of some entirely new

technology? It is no paradox to say that one of the greatest uncertainties confronting new technologies is the invention of still newer technologies.

- The basic fact is that it is extremely difficult to forecast how the market will respond to the introduction of some new technology.

Sources:

http://en.wikipedia.org/wiki/Innovation_economics
http://economics.about.com/library/weekly/aa060204a.htm
http://www.competeprosper.ca/images/uploads/Feldman_WIM_Summary_2005.pdf
http://breakthroughgen.org/blog/2011/06/innovation_economics_pulling_t.shtml
http://www.slideshare.net/ingenesist/innovation-economics-next-presentation
http://www.oecd.org/dataoecd/55/49/34267902.pdf

Human Resources

Innovation does not occur by itself. Successful companies create competitive advantage in the marketplace through innovation and creativity. These companies are innovative not by accident; they effectively manage human resources to create and market new products and services. People are an innovative organizations' most important resource.

It's people that innovate. It's not systems, processes, plans or hardware!

Following questions are relevant for this topic:

Process owner

there is (at least) one person in our company responsible for innovation management

→there should be one person responsible for innovation management, regardless of enterprise size

→ she/he is the main responsible and contact person along the innovation process

→everybody in the company is familiar with the activities and the obligations of the innovation manager

→it is important that this person is not only formally performing on paper, but in the daily routine

→the responsibilities are: work with individuals and teams to encourage and facilitate innovation; supervise the innovation processes to ensure that they are followed correctly and successfully

Sources of ideas

Our company uses in-house sources to find ideas for innovation

→ Innovation springs from the minds of creative individuals

→the most interesting ideas for innovations are mostly defined by the staff

→they have a great knowledge on the business, the needs of the costumers and the potential in developing products

Networking is a source of new ideas

Our employees use their personal networks to find ideas for innovations	☐	☐	☐	☐	☐

colleagues exchanging their knowledge with their technology partners

Our colleagues are contact persons for our technology partners	☐	☐	☐	☐	☐
Our employees seek the dialogue with the technology partners	☐	☐	☐	☐	☐

→again, it's the people who generate ideas for innovation. If the management supports the staff, many will be encouraged to use different sources in order to find ideas for innovation. They will use their professional and private networks, they will carefully look around and check every possibility

acquire new knowledge thru project related employees

Our company is willing to hire project related domestic r&d employees	☐	☐	☐	☐	☐
Our company is willing to hire project related r&d employees from abroad	☐	☐	☐	☐	☐

→ additional r & d staff can be a huge enrichment for the innovation and the innovation process

→first: new expertise knowledge supports the development of products and processes. Most of all employees from abroad can bring new know-how and state of the art technology into your company

→second: new people in an organization tend to question the way things are done. They can show the weaknesses of the organization and help you so to improve the business

Expertise

These employees have expert knowledge	☐	☐	☐	☐	☐
These employees speak fluently languages of foreign project partners	☐	☐	☐	☐	☐

→Changing market conditions such as: Increasing internationalization and globalization of the markets, high competition pressure, decreasing product life cycles, increasing innovation speed, growing market segmentation and customer orientation, increasing demands on quality, increasing complexity, dynamics and technology etc. are great challenges for innovation strategies of the enterprises which in turn lead to complex qualification requirements of the employees:

- faster decline of the knowledge and the need for lifelong learning
- high demands on the specific subject skills but also on the methodical and social competence
- of the employees
- communicative and language competence

→The qualifications of the employees are, on the one hand, a pre-requisite for innovation, because it is indispensable for the start and the permanent further development of innovation. On the other hand, qualification is a result of innovation as well, when technological, organizational and social innovation changes in the qualification profile are taking place among the employees
→Lacking qualification can turn out to be a bottleneck in the innovation process in an enterprise
when enterprises design and carry out their innovation, mainly from the technological aspect, without preparing their human resources in a suitable way

„Source“ of innovation

Basics

Ideas are the source of innovations:

Therefore it is essential to ensure that ideas emerging from the work-force, be it from R&D, sales, marketing or other personnel are firstly welcome, maybe fostered by some idea reward system, then properly checked with regard to economic soundness, financial benefit for company, novelty and relevance for company / markets (if yes, then maybe patent application !).

A classical approach was, that ideas emerge primarily from own R&D.
Yet, the sources of ideas encompass a wider realm than just the company, which is nowadays summarized under “open innovation”:

- Ideas from cooperation with innovative suppliers
- Ideas from cooperation with lead customers
- Ideas for improvement based on customer feedback and complaints
- Ideas from cooperative R&D with universities / other R&D institutions
- Licensing of patented inventions in suitable technical fields
- Crowd sourcing using Web 2.0 possibilities like idea competitions

If you don’t want to innovate by coincidence you need to find a way how to structure and find ideas systematically

Several creativity methods, from brain-storming and brain-writing to the sophisticated TRIZ method (see: http://en.wikipedia.org/wiki/TRIZ), a problem-solving, analysis and forecasting tool derived from the study of patterns of invention in the global patent literature, can be used to find ideas systematically. Alternatively or additionally, own patent searches for transferable technical solutions from other technical fields can be used.

The collection, structuring and documentation of ideas is a challenge which should be faced by installing a documentation and evaluation system which ensures a quick evaluation and response, a decision whether to file a patent or keep it confidential in case of novel inventions or a calculation of benefits and preferably some remuneration in case of convincing improvement proposals. In order to ensure later patentability in suitable cases the whole idea collection / evaluation / documentation process has to be done confidentially, with evaluation by internal experts

As even bright ideas are only the first step of an innovation, it is of utmost importance to foster a positive attitude towards new, maybe radically new ideas in the company, e.g. by installing a mentoring system and allocating some fixed resources (e.g. 5 – 10%) to R&D efforts checking firstly the feasibility of the technical solution and then to develop it to meet technical A proper R&D management, very often following the Stage-Gate® model for a successful market entry, at least in a niche market with early adopters at first hand.

A proper R&D management, very often following the Stage-Gate® model (see e.g. http://www.prod-dev.com/stage-gate.php) an sufficient allocation of resources and commitment of the top management is then essential to increase the chances for successful innovations. Yet, in case of radical innovations it is essential not to eliminate them in an early stage by applying strict economical benchmarks, current marketing considerations or customer state-of-the-art targets.

Interactions with other innovation topics

Technology transfer:

Technology transfer is a frequently used term, yet the detailed methods differ and the success depends on a lot of parameters:

- Information about and matching of appropriate R&D partners
- Appropriate collaboration with clear roles and targets
- Contract regulations, including intellectual property considerations
- Support for allocation and successful use of available R&D funding

In a lot of countries, organizations supporting technology transfer in the aspects described above have been established and should be contacted. In Upper Austria, the TIM (Technology and Innovation Management) initiative is a joint effort by the local Chamber of Commerce and CATT Innovation Management.
Studies show, that companies, especially SMEs, which have made use of technology transfer by collaboration with R&D providers, have on average a substantially improved innovation performance which leads to more patent applications, better revenues, improved customer perception and higher stability under generally difficult market conditions.

Technology partnering:

Technology partnering relies upon the notion that very often a technical solution offered by another company may be the better choice than own R&D, especially if important technical solutions in non-core technical fields are required and an own development effort would not be economical. This is an aspect of open innovation which grows in importance.
Yet, the challenge is to find appropriate technology partners and suitable existing solutions for implementation into own development efforts.
In order to foster open innovation, especially for a more comprehensive and future-oriented concept of a common innovation market in Europe making full use of its innovation potential, information about relevant technology offers and demands and support in matching the potential technology partners is essential.
This task is tackled by the online market place hosted by the Enterprise Europe Network (EEN), an initiative of the European Commission. Aside from support for placing and evaluating the anonymous offers and demands, the matching is then performed via the local partner offices.
Brokerage events for specific topics organized by the EEN pose yet another effective way for technology partnering and constitute an effective source of innovation.

Continuative information / links / etc.

Analysis of competitors' products, markets and competitors
This approach is an important task of internal marketing department in cooperation with sales department and R&D. Yet, additionally or alternatively in case of SMEs market searches by specialized institutions should be used to gain not only an overview but also a basis for future acitivties

Creativity Methods
As there are many different methods, consultation of specialized providers may be used to find and use appropriate methods

Patent searches
Support by patent professionals or patent information centres may be used for this important task. Information can be found here: http://www.epo.org/searching/patlib/faq.html
Web 2.0 open idea competitions can be used for crowd sourcing. Examples are given here: http://www.openinnovators.net/list-open-innovation-crowdsourcing-examples/