

# Know How Transfer in Austria

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## Abstract:

The Austrian government has recognized approximately 40 years ago the necessity of cooperative research between universities and research centres as well as the industry, preferably small and medium-sized enterprises (SME's). Especially in the field of High Technologies there was a big gap between these two worlds. Since that time the Austrian government started several initiatives to close this gap. In the following a short overview about this actions as well as some results are given and shortly discussed.

## 1. Introduction

In the sixties the Austrian government the former Ministry for Science and Technology has recognized a deficit of the Austrian industry, especially SME's by the introduction of new technologies. According to several studies the reasons were:

1. Limited knowledge on future technological developments.
2. Less capacity for own developments.
3. Nearly no educated people in high technologies.
4. Less experiences for future market developments.
5. Employees are not in favour for new technologies.
6. Limited financial resources.

In the past 40 years the Austrian government started several initiatives to minimize these deficits. Therefore in the following some initiatives will be described according to these six points.

## 2. Limited knowledge on future technological developments. Example Automation

Austria as a founding member of the "International Federation of automatic Control – IFAC" was present with 5 contributions at the first IFAC World Congress in Moscow 1960. At this first world congress Austria had recognized that some of the new results in automation presented and discussed at this congress could be of interest for the Austrian industry as well as universities and research centres. Therefore the Austrian government was in favour to support the Austrian presence in IFAC. Since the foundation of IFAC in 1957 the Austrian NMO was the Austrian Centre for Productivity and Efficiency – ÖPWZ; an organization for technology transfer in the Austrian industry.

Until now time more than 60 IFAC events were organized in Austria – third place in IFAC statistics, e.g.

1967 Symposium Automatic Control in Space

1976 Workshop Optimization Applied to Transportation  
 1977 Conference Dynamic Modelling and Control of National Economies  
 1980 Symposium Modelling of Large Scale Energy Systems  
 1980 Workshop Real Time Programming  
 1983 Symposium Systems Approach to Appropriate Technology Transfer  
 1983 Workshop Supplemental Ways for Improving International Stability (SWIIS)  
 1985 Conference Digital Computer Applications to Process Control (DCA'85)  
 1986 Symposium Software for Computer Control (SOCOCO'86)  
 1986 Symposium Control in Transportation Systems (CTS '86)  
 1986 Symposium Simulation of Control Systems (SCS'86)  
 1986 Workshop Mass Spectrometry in Biotechnological Process Analysis and Control  
 1986 Symposium Theory of Robots (TOR'86)  
 1989 Workshop Supplemental Ways for Improving International Stability SWIIS, in cooperation with the Hungarian NMO  
 1989 Symposium Skill Based Automated Production (SBAP'89)  
 1989 Symposium Safety of Computer Control Systems (SAFECOMP'89)  
 1991 Workshop Computer Aided Systems Theory  
 1991 Conference Dependability of Artificial Intelligence Systems (DAISY'91)  
 1991 Workshop Electric Power System Control Centers  
 1991 Congress Medical Information Systems and Expert Systems  
 1991 Workshop Distributed Computer Control Systems (DCCS'91)  
 1991 Symposium Robot Control (SYROCO'91)  
 1991 Workshop Cultural Aspects of Automation (CAA'91)  
 1992 Workshop Experience with the Management of Software Projects  
 1992 Workshop Economic Time Series Analysis and System Identification  
 1992 Workshop Cost Effective Use of Computer Aided Technologies in Small and Medium Sized Companies  
 1992 Symposium Low Cost Automation (LCA'92)  
 1994 Workshop Intelligent Manufacturing Systems (IMS'94)  
 1995 Workshop Human-Oriented Design of Advanced Robotics Systems (DARS'95)  
 1995 Conference Supplementary Ways for Increasing International Stability (SWIIS'95)  
 1997 Workshop Manufacturing Systems: Modelling, Management and Control (MIM'97)  
 1999 Workshop Multi-Agent-Systems in Production (MAS'99)  
 2000 Symposium Robot Control (SYROCO'00)  
 2001 Symposium Information Control Problems in Manufacturing (INCOM 2001)  
 2001 Conference Social Stability: the Challenge of Technology Developments (SWIIS 2001)  
 2002 Workshop Robots for Humanitarian Demining (HUDEM'02)  
 2003 Workshop Technology and International Stability (SWIIS'2003)  
 2004 Conference Advanced Control Strategies for Social and Economic Systems (ACS'2004)

Austria was and will be also involved in the organization of IFAC events together with other countries. Examples are:

“Supplemental Ways for Improving International Stability - SWIIS”, Budapest

“Intelligent Manufacturing Systems – ims”, Gramado, Brasil, 1999

“Intelligent Assembly and Disassembly – IAD”, Gramado, Brasil, 2001

In 1969 during the IFAC World Congress in Warsaw the IFAC Technical Committee on “Social Aspects of Automation” was initiated by the Austrian Fred Margulies. Meanwhile this Technical Committee is one of the largest in IFAC. Furthermore in 1991 – as a follow up of the first workshop on “Supplemental Ways for Improving International Stability – SWIIS” an IFAC TC with the same name was installed by Hal Chestnut (USA) and Peter Kopacek.

The Austrian government was also responsible to the transfer of the IFAC Secretariat to Laxenburg in Austria in 1984. The IFAC secretariat has until this time a permanent secretariat as an annual financial contribution from Austria.

As a national platform for the transfer of knowledge of IFAC in the Austrian industry the “IFAC Beirat” Austria was installed in 1983. The main tasks of this “IFAC Beirat” are:

- a) to advise the Austrian government in subjects on automation or related to automation.
- b) make the Austrian industry especially SME’s familiar with selected newest developments on an international level in the whole field on automation – process as well as manufacturing automation.

The IFAC Beirat Austria consists now of 30 members from industry as well as from academia. In the meeting of this body twice a year industrial developments and research guidelines were discussed.

For these tasks the IFAC Beirat Austria has two major tools. He is responsible for the publication of the International Journal Automation Austria (IJAA) which is published two times a year and is distributed free of charge to approximately 800 interested people in Austria and abroad. Furthermore the IFAC Beirat Austria is responsible for the organization of the annual Austrian automation day; usually in October. In 2010 the 25<sup>th</sup> Automation Day will be organised. In short presentations from industry, universities and research centres the state of the art and further developments are outlined. In this annual automation day the Fred Margulies award is given for outstanding contributions in application of modern automation concepts.

Because of the success international, bilateral Automation Days were organised e.g. with Argentina, Brasil, Bulgaria, Cuba, Czeck Republic, Ecuador, Slovakia, Slovenia, Romania,...

The “IFAC Beirat” Austria is also responsible for relations to other international organizations like International Federation on Robotics – IFR, International Advanced Robotics Programme – IARP and Robotics in Alpe-Adria-Danube-Region – RAAD. Some of the members are involved in other international organizations, like the “International Federation of Information Processing – IFIP” and the “International Measurement Confederation – IMEKO”.

Because of reasons of the Austrian law the “Austrian Society for Automation and Robotics – ÖGART” was founded as a legal umbrella of the IFAC Beirat Austria.

*This is only one example for Know How transfer from the international via a national level to the industry.*

### 3. Too less capacity for own developments

As pointed out earlier Austrian small and medium-sized enterprises have usually too less capacity for own developments. As a logical consequence research topics should be outsourced from these companies to university and research centres. One of the reasons is the situation on Austrian universities.

- Universities have man-years on research capacity available in form of project works, MSc theses, PhD theses.
- If a student works in a company – its a good possibility to a test for a future employment.
- Universities are used to be confronted with “unsolvable” problems.
- SME`s should contact University institutes as early as possible – because of their “Dead time”.
- Most of the University institutes are not in favour to implement a solution.
- Usually institutes have more experience in funding.

Actions for the improvement the cooperative research between the industry especially SME`s and Universities.

#### Support of consulting:

First consulting of a company by a University institute, between 4 or 8 hours is free of charge for the company – financed by the Austrian chamber of commerce.

Extended consulting, 40hours is free of charge or the company has to contribute with 50% of the costs (depends on the sub-country) for the company – financed by the Austrian Chamber of Commerce.

#### Innovation cheque

For an innovative project idea there is the possibility to get an innovation cheque ( €5000.-- to 15000.--) from the Austrian Chamber of Commerce. This cheque must be used for a feasibility study by an independent expert. According to the evaluation the innovator can apply for start up support from different sources – maximum €200.000.-- - for the founding of a company.

#### Support for a co-operative project:

There are several sources available. A project could be financed

- a) by the Austrian Research and Promotion Agency –FFG
- b) by the local government
- c) by the government
- d) by the European Union ( Austrian Research and Promotion Agency –FFG )

Examples for b)

#### *The City of Vienna:*

**ZIT** Zentrum für Innovation und Technologie (The ZIT Center for Innovation and Technology), a subsidiary of the [Vienna Business Agency](#), was founded in the year 2000. ZIT serves as the technology promotion agency of the [City of Vienna](#).

The activities of ZIT encompass providing direct financial assistance (i.e. grants) to companies or making a technology-specific infrastructure available, as well as the implementation of a broad range of accompanying measures in all phases of the innovation process. ZIT employees evaluate the technology sector with respect to trends, developments and functionality. On this basis, they design measures to support technology-oriented companies.

**INiTS** is an organisation that helps to achieve a constant increase in the number of company start-ups with an academic background in Austria. Our objective is to continuously increase and secure the quality and likelihood of success in these start-ups through early and well targeted support. Thanks to close cooperation with the industry and links to existing programmes that support start-ups, we see ourselves as the central contact point for innovative entrepreneurs in and around Vienna.

The greatest potential for know-how and knowledge-based company start-ups in the whole of Austria can be found in the Vienna region. Our objective is to harness and activate this potential. "Innovation into Business" - we come in with our services when academics want to put their innovative research findings into practice by starting up a company. Our aim is to promote entrepreneurship and anchor it in natural-scientific, technical and other research facilities.

#### *The Region Upper Austria.*

Within the last years, Upper Austria has positioned itself as a competent region for clusters and networks. The policy for economic development and technology is cluster and network oriented and is consequently realized – as a strategy for companies to sustain innovation and competition. This idea will be continued systematically in the future on base of the strategic program [“Innovative Upper Austria 2010plus”](#).

Since 1998, clusters were gradually developed in important economic branches in Upper Austria: automotive, plastics, eco-energy, furniture & timber construction, food, health technology, mechatronics and environmental technology. In addition, inter-branch networks have been set-up in the fields of human resources, design & media, logistics and energy efficiency. Small & medium sized enterprises (SMEs) are particularly supported in our policy.

Research grants from several ministries (BMVIT, BMwA, BMSA) for application oriented research directly given to the University or an Institute. Duration: 6 – 36 month

Special research emphases: Including several partners ( 12 in average) from industry as well as from Universities. The duration is in the average 3 years, there is a possibility to get financing for an extension.

Examples are: Microelectronics, CIM, IMS, Biotechnology, Renewable Energies, Electronic scrap recycling, Nano- and Femtotechnology,.....

#### Centres of excellence:

Universities/research institutes and companies ( min. 12) are working together on a specific subject for at least 3 years. (Financed by BMVIT and BMWA).

#### Action “Scientists for Industry”

A scientist from the University works for 6 to 12 month in a company on a distinct project. Half of the costs of company for the scientist will be covered by the government.

### Technology Centres:

In Austria we have currently 70 Impuls centres and 20 Technology parks.

Example:

#### **Biocenter | Campus Vienna**

Biocenter came into being in 1992, offspring of the close relationships between private industry and the life science research facilities at the University of Vienna. The nucleus was made up of eight university departments doing world-class research in molecular biology and the Research Institute of Molecular Pathology, a life science think tank set up by the Boehringer Ingelheim Group. The year 1998 marked the foundation of Austria's largest young biotechnology start-up at the Campus. The Campus has not stopped expanding since. A broad range of individual organisations creates an environment in which cooperative research and development thrives. The Campus continues the Viennese tradition of diversity and contrasts.

### Research Centres

Example: AIT

The AIT Austrian Institute of Technology, Austria's largest non-university research institute, is among the European research institutes a specialist in the key infrastructure issues of the future. As an Ingenious Partner to industry and public institutions, AIT is already researching and developing the technologies, methods and tools of tomorrow - paving the way for the innovations of the day after tomorrow.

The Republic of Austria (through the [Federal Ministry for Transport, Innovation and Technology](#)) has a share of 50.46%, while the [Federation of Austrian Industries](#) owns 49.54% of the AIT Austrian Institute of Technology.

In Austria, there are over 900 employees - largely based at the main facilities Vienna Tech Gate, Vienna TECHbase, Seibersdorf, Wr. Neustadt, Ranshofen and Leoben – working on the development of those tools, technologies and solutions for Austrian industry considered to be of future relevance and which comply with the institute's motto "Tomorrow Today".

Seibersdorf is also where the two wholly-owned subsidiaries "[Seibersdorf Labor GmbH](#)", which offers laboratory and other services, and "[Nuclear Engineering Seibersdorf GmbH](#)", are located.

### Attract Austrian SME's to join projects from the EC:

Austrian SME's have problems to be involved in EC projects. Therefore there is a

- e) support for making a first proposal, financed by BMVIT
- f) The Office for international technology co-operation BIT was founded and financed by the Austrian government BIT is responsible for: First decisions: national or international project partner search, first project draft. "Fine tuning" of an EU project proposal, contacts with responsible officials in Brussels, support in project management, nomination of project evaluators in Brussels. This is now the task of FFG.

#### **4. Education in new technologies.**

30 years ago Austria had nearly no educated people in automation. First initiatives were the development of postgraduate courses on several subjects of automation on different levels. On the lowest education level for example the Austrian College for Automation (ÖCAT) was installed in Styria. In one year unemployed people got a special education in fundamentals of High Technologies from a practical point of view. Furthermore fundamentals of High Technologies were also introduced as a obligatory subject in Engineering Schools (HTL). A little bit later in the same schools special postgraduate courses were also offered. Examples are automation and information technologies, both with a duration of one year.

On a higher level postgraduate university courses were installed mostly together with the Extension Institutes of Austrian Universities. There were two types of courses: long courses like automation I, II and III in the duration one year each were collected in the Austrian postgraduate education programme in automation. The participants received an official certificate from Vienna University of Technology. Beside this fundamental education short courses of special new topics of automation, like time discrete systems, application of artificial intelligence, fuzzy and neuro controls, robotics... were offered with a duration from 8 – 40 hrs.

On the management level some postgraduate international study programs were also developed mostly together with universities as well as education institutes from abroad. A very good example is the Engineering Management Program as a co-operation between the Vienna University of Technology and Oakland University in Rochester, MI, USA. After one year the participants will receive the degree Master of Science in Engineering Management from Oakland University as well as an official certificate of Vienna University of Technology. The highlights of the 480 hrs program in one year are:

“Master of Science – MSc.” Degree and academic record of Oakland University; official certificate of Vienna University of Technology.

Executive program: 10 (12) 40 hrs. Modules (Friday morning to Tuesday evening) every 3-6 weeks in Austria and a two weeks stay in USA.

Combined American – European faculty (50 : 50).

Two weeks in USA with company visits. Program unique in Europe.

Language: English.

More than 60% of the graduates reached high management positions.

This program is currently running under the “Continuing Education Centre – CEC ” of Vienna University of Technology.

CEC is a widespread range of products customized to the needs of with technical or scientific backgrounds as well as the requirements of companies. This includes full-time and part-time programs. The Continuing Education Centre will further strengthen its position as a competent partner on the international postgraduate continuing education market by offering professional and high-quality services.

#### **5. Less experiences for future market developments.**

A company can cooperate with an institute on several Universities e.g. University of Economics, VUT ( Institute of Economic Sciences), .....or with a marketing company. They are ready to make a marketing analysis and a short, mid and long term forecast for a distinct

product or a group of products. Partially supported by the government. See “Innovation cheque”.

## **6. Employees are not in favour to introduce new technologies.**

One of the main tasks of the IFAC Beirat. The founder – Fred Margulies – installed 1969 during the IFAC World Congress in Warsaw the IFAC TC on “Social Aspects of Automation”. Meanwhile this TC is one of the largest in IFAC.

## **7. Limited financial resources.**

This item is closely connected to “Less capacity for own developments”. The actions of the Austrian Government are nearly the same than in this item.

## **8. Conclusion:**

The Austrian government has recognized 40 years ago a deficit in co-operation between universities and the Austrian industry, mainly SME`s in the field of High Technologies. Therefore some actions in different fields were initialised. As a result of these actions, mentioned above, we have now in Austria a good “climate” for cooperations between industry and universities as well as research centres. We have now some companies which are very efficient in the field of new technologies worldwide. Austrian scientists and engineers are recognized in the international community.

*But nothing is perfect – we have to look for further improvements.*

## **9. Annex: Major Research founding Bodies**

### *FWF Austrian Science Fund*

The Austrian Science Fund (FWF) is Austria's central funding organization for basic research. The purpose of the FWF is to support the ongoing development of Austrian science and basic research at a high international level. In this way, the FWF makes a significant contribution to cultural development, to the advancement of our knowledge-based society, and thus to the creation of value and wealth in Austria.

The most important figures and program information concerning the FWF in the year 2009 are published in the Statistics Booklet. This contains concise summaries of the FWF's funding programs, the most important statistics relating to the FWF and data on funding trends, together with general information about science and research in Austria, also in comparison with other countries.

### *Austrian Research Promotion Agency (FFG)*

is the national funding institution for applied industrial research in Austria. FFG offer a comprehensive range of services for Austrian enterprises, research institutions and researchers from the management of public funding programmes to consulting services in all phases of technology development and innovation, from support for integration into European research



programmes and networks to the promotion of Austria's interests at the European and the international level.

The Austrian Research Promotion Agency (FFG) is the national funding agency for industrial research and development in Austria. As a "one-stop shop" offering a diversified and targeted programme portfolio, the FFG gives Austrian businesses and research facilities quick and uncomplicated access to research funding.

The FFG was founded on 1 September 2004 (pursuant to the FFG Act on establishing a research promotion agency, Federal Law Gazette I No. 73/2004). The FFG is wholly owned by the Republic of Austria, represented by the [Federal Ministry for Transport, Innovation and Technology \(BMVIT\)](#) and the [Federal Ministry of Economics and Labour \(BMWA\)](#). As a provider of funding services, however, the FFG also works for other national and international institutions.

#### *Austrian Chamber of Commerce*

ADVANTAGE AUSTRIA is the official Austrian Foreign Trade Promotion Organisation and the largest provider of services in the area of foreign trade. Advantageaustria.org, powered and operated by ADVANTAGE AUSTRIA, offers easy access to your nearest ADVANTAGE AUSTRIA office and to all relevant information on Austria as your business partner.

#### *Austrian Ministry for Transportation, Innovation and Technology - BMVIT*

Our concern is with the wellbeing of our citizens nationwide and with making an active contribution to European integration. Our work is geared to developing Austria in a sustainable manner, making the country a desirable location and improving the quality of life of its citizens. To that end we work to secure conditions in which a fair balance of interests in society can be achieved in the areas of communications and mobility and we promote innovation and technology. In this way we are laying the foundations today for successes tomorrow.

We are client- and service-oriented, and we provide the best possible service and competent interlocutors, thereby guaranteeing high-quality assistance to those citizens, organisations, companies and partners which cooperate with us.

Together with our partners we develop the right conditions for areas of vital importance to our country. The optimizing of infrastructure such as railways, roads, waterways, air transport and telecommunications, and its technical and operational safety, is a factor which significantly determines our quality of life. Innovation and technology pave the way to future developments. And increasingly we provide these services in a pan-European context. I have a voice in the processes of decision-making, and clearly agreed working objectives help to motivate them further.

#### *Federal Ministry of Economy, Family and Youth former BMWA*

Economic policy aims at the sustainable improvement of the citizens' quality of life by securing employment, income growth and fair income distribution with due consideration of adequate social and environmental standards. The Federal Ministry of Economy, Family and Youth primarily deals with questions of structural policy and searches for long-term solutions.

Center 1 develops strategic approaches, coordinates its conceptions of economic policy with those of other organisational units in the Ministry and also undertakes the implementation in partial areas.

The current emphasis is on location policy, employment policy and competition policy for Austria as well as in the European context. Location policy formulates positions and measures for the sustained enhancement of Austria's international competitive strength. Its results are closely connected with employment policy, which also receives many impulses from overall European employment strategy. Competition policy creates the market framework for the other policies.