PLATTFORM ftEval
Forschungs- und Technologieevaluierung

Research Information Systems

Nr. 27
Mar. 2006

in Cooperation with:
AQA

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Preface

Gathering relevant information timely is a prerequisite for every evaluation as it is for strategic planning, quality management and thorough decision making. Austrian universities have put much effort in building up powerful tools for collecting relevant and interesting data on their research and teaching output. Three of these efforts are presented in this Plattform Newsletter on research information systems. In addition, we also present the Swedish and the German system as an international benchmark: Torbjörn Winquvist from Vinnova and Stefan Hornbostel from IFQ summarize the efforts in their countries.

The powerfulness of the Austrian efforts gives cause for confidence: it shows the awareness of universities for the need of strategic planning; it is a significant step to fulfil the legal target to create "Wissensbilanzen" (Intellectual Capital Reporting); and finally, it is an important element to fight evaluation (data?) fatigue, and to ensure transparency and comparability on universities.

However, the diversity (and the powerfulness) of these efforts gives also cause for concern *"Collect all data that is needed and need all data that is collected"*: Are the information systems too detailed, too complex and too costly? There is a certain amount of cross-university cooperation, but is this enough? What about interfaces between the different university systems – can the data be aggregated on a national / regional level? What about interfaces to funding agencies and to evaluators? Have they, again, built up their own systems?

There is a long way ahead to a perfect research information system. Nevertheless, the energy and enthusiasm of those responsible for building up these systems at Austrian universities and the awareness of stakeholders for the need of such systems give reason for optimism.

We would also like to draw your attention to the upcoming Evaluation conference in Vienna: "New Frontiers in Evaluation" will bring together policy makers, programme managers, evaluation experts, and managers of science funds from around the world for two days of intensive exploration of current best practices—and of selection processes and evaluation methods geared towards the complexity of multiple levels of decision making and interdependent science program portfolios.

New Frontiers in Evolution, April 24th – 25th 2006

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Preface

Austrian public universities have been investing considerable resources and efforts in the development of institutional information systems. Going beyond legal obligations to collect and analyse information, several universities have been advancing innovative solutions, and they have been co-operating with other universities.

A spectrum of existing information systems has been presented at a seminar of FTEVAL and AQA on 11 November 2005 in Vienna. The discussion has shown that the use and the potentials of institutional information systems need to be reflected on the background of different purposes and functions:

- External authorities (esp. ministries, funding bodies) require information for reasons of decision and control. As a common principle, systems have been set up with a view to fulfilling reporting obligations.
- There is an increasing demand from outside stakeholders (esp. students, labour market, and academic world) to obtain a transparent picture of a university and its performance. Universities need comprehensible information for their communication work and public relations.
- The internal function of data collection and analysis is not new, but it gains importance in the context of increasing institutional autonomy of universities. This dimension is certainly the most relevant for the future of institutional information systems: Planning, decision and control need do be based on reliable and valid information that is made available in due time.
- Comparing institutions and their performances is a recent phenomenon at the international level. Rankings have become popular - despite a broad range of methodological credibility. Universities show an increasing interest in benchmarking with comparable institutions.

The present cases illustrate that thorough and long-term development of information systems, combined with the sharing of experiences with other universities, is a prerequisite for their acceptance and success. Defining the right indicators, collecting valid and reliable information and communicating relevant information to the relevant stakeholders and interest groups and persons are further component.

A world where indicators, key figures and benchmarks provide for orientation runs a risk of a multiple collection of the same data. A main future challenge of data systems lies in their ability to satisfy the needs of various internal and external stakeholders without asking the same question more than once.

AQA has been organising different types of evaluations during the first two year of its existence and can draw a principal conclusion: Information systems and databases are a backbone of institutional quality management and should be recognised as such within evaluation procedures. As a consequence, the load of self-reporting in the framework of external evaluations should be reduced and already available information should receive more attention. In assessing the performance of institutional quality management processes more interest should be devoted to the function and effects of information systems in universities.

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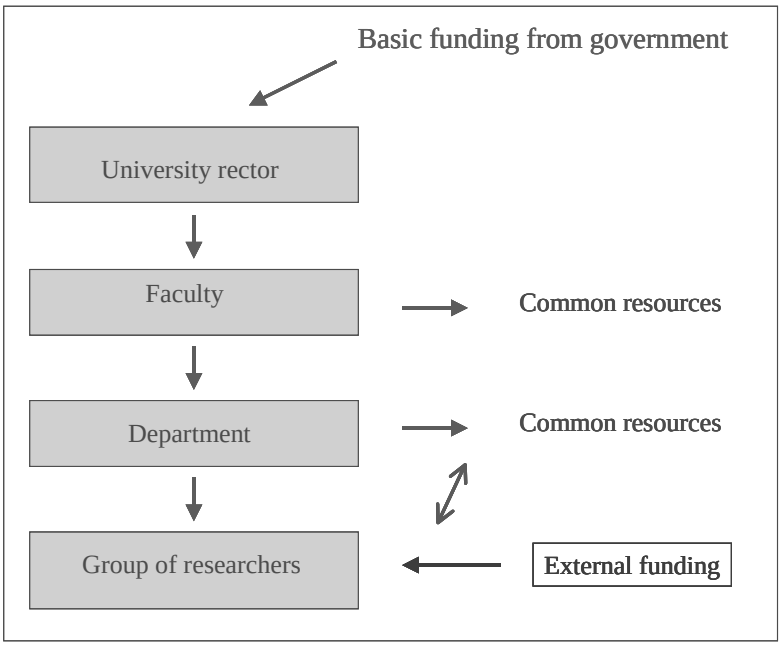
Approach to a National System for Monitoring University Research in Sweden

Present monitoring of externally funded university research

Research at universities in Sweden is funded by external R&D funding organisations, such as research councils and innovation agencies, companies and European Union's framework programmes, as well as by basic funding from the government. In recent years, a considerably shift has taken place, today the governments basic funding is around 45 % of total research funding. Hence, finding external funds has become a major issue for most researchers.

Government's basic funding of research is sent to the universities' rectors. The money is then distributed on faculty and department levels, incl. resources for common use, such as libraries. External funding, on the contrary, is received directly by contracting groups of researchers. An increasing fraction of the external funding has to be shared with department and faculty levels – an issue that is causing some argument. Thereby, an increasing fraction of the external funding has to be shared with department and faculty levels – an issue that is causing some argument.

Figure 1 Distribution of basic funding from government

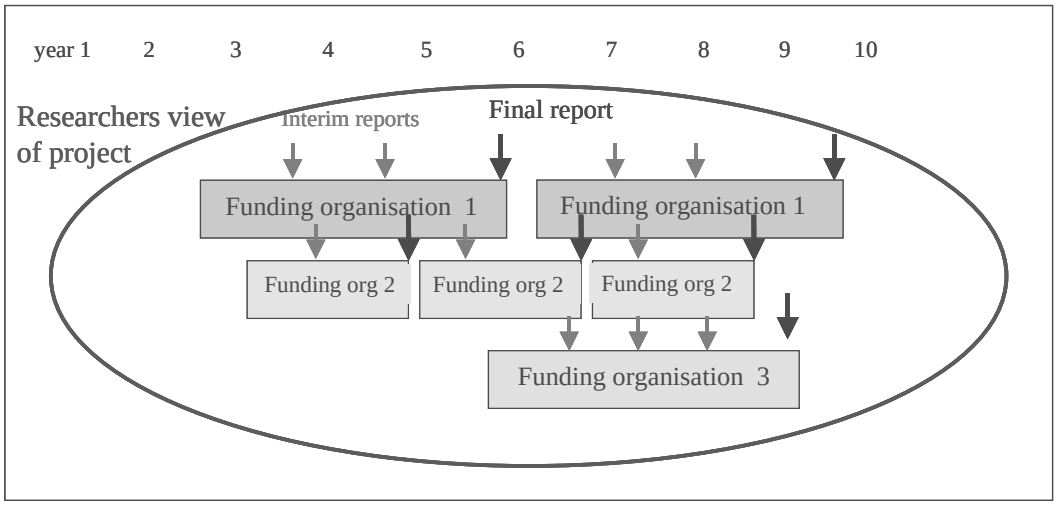


There are a considerable number of external R&D funding organisations in Sweden. Each of them has its own tradition as regards contract stipulations, including requirements on information in interim and final reports.

From the perspective of a funding organisation, a contract is mostly seen as one research project, with a given start and end date. A report on the achieved results is normally expected, including the resource allocation.

From the viewpoint of researchers, contracts with funding organisations are rather seen as means to finance research projects that are defined by the researchers themselves and regard longer time perspectives.

Figure 2 Schematic illustration of contracts (’projects’) of funding organisations and the researchers’ own view of a research project (ellipse). The arrows indicate reporting that different funding organisations require.



It appears common that researchers see external and internal funding as accumulated resources that are used to plan and finance all activities of the group (senior researchers’ salaries, PhD students’ salaries, equipment, premises etc.). Hence, reports to funding organisations are an estimation of resources spent, rather than the result of specified accounting. In a situation with several funding organisations, reporting becomes burdensome, and its quality varies.

Understanding of university research

Another observation regards national statistics. Swedish statistics present only aggregated data (universities and research subjects on faculty level) with a time lag of up to three years. The focus of these statistics is on input to rather than output from research.

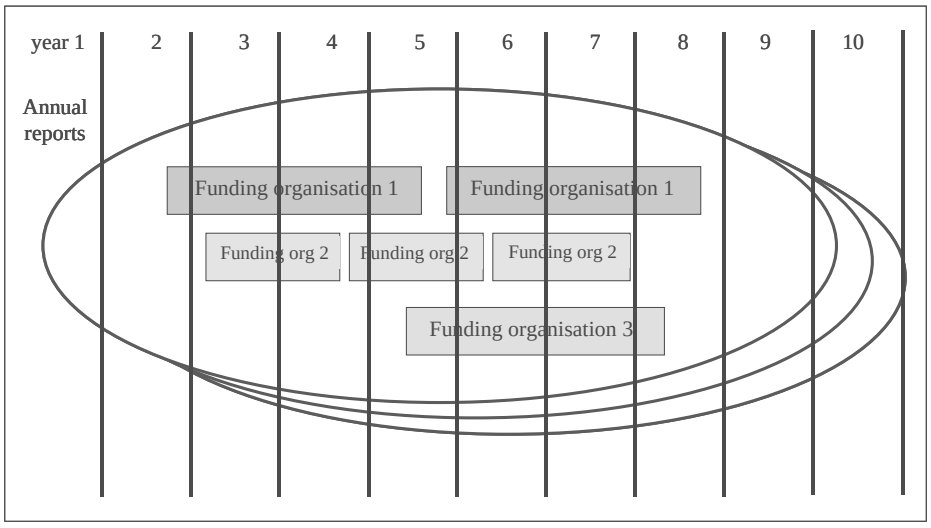
An alternative approach

The present tradition of reporting externally financed projects reflects an accountant's perspective rather than a wish to understand the working conditions on what is in fact the operational level of university research. The collection of information, in particular of economic data, is felt burdensome by university staff while, at the same time, the information collected is in practice of limited use to the funding organisations.

Because of this three research councils and an innovation agency cooperate on a project to organise an alternative way reporting. These are the Swedish Research Council, the Swedish Council for Working Life and Social Research, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, and the Swedish Agency for Innovation Systems (VINNOVA). Together, these organisations represent about 30% of external funds to university research. The approach is partly based on the experiences from a similar monitoring system that the former innovation agencies STU/ NUTEK ran on its portfolio of university projects in 1989 – 1999. The Association of Swedish Higher Education (university rectors) has found the idea interesting and supports the project.

The key aspect of this new concept is to replace individual reports for each funding organisations by one annual report that considers the entire work of the research group. Consequently, this approach shifts the focus from individual projects to groups of researchers. Like an income-tax report the report will have the form of an annual questionnaire that has to be signed.

Figure 3 The ellipses symbolize the project portfolio of a group of researchers. The vertical lines indicate annual reports from the group which regards all research work (seen from the researcher's perspective).



The proposed annual report includes basic information on the research environment. An individual funding organisation may have requirements for further information in their contracts, but the same information should not be asked twice. In short, the monitoring system involves the following information:

- areas of research (3 highest levels of national statistics)
- university & external funding (incl. international cooperation)
- research personnel
- research personnel's links to education
- personnel mobility (in and out)
- visiting researchers (in and out)
- scientific publication
- higher exams
- cooperation with universities and other actors
- commercialisation of results (when applicable)

Information is to be reported electronically and stored in a data base structure. Consequently, an annual report will be an updated version of the previous one, rather than a full new report (over time, an annual change rate of about10 % of the composition of the research group is foreseen).

The approach depends on the approval of the majority of R&D funding organisations, and on the participation of the universities in the monitoring system. In practice, the funding organisations will form a cooperative for the monitoring system, based on cost-sharing, which buys required services, while the universities take responsibility for the acceptance of the monitoring system among faculties, departments and researchers.

Expected advantages

For the universities, the proposed system is expected to simplify the reporting work, which will reduce the reporting burden on research leaders and, as a consequence, will reduce the need for economic administrators.

Moreover, the monitoring system is believed to result into common standards among universities, such as standards for local data bases on scientific publications, and other work that is presently not coordinated.

Funding organisations are believed to benefit from the cooperation due to an inexpensive increase of the quality of their monitoring system because of cost-sharing. In addition, they will receive an improved understanding of the sponsored research groups, e.g. by making co-financing more visible.

External funding organisations, as well as universities, will improve their understanding of the funded research environments. For example, a new PhD student will be reported only once, and not once per funding organisation. This will enhance the information on university research in national statistics considerably.

Common questions

Key questions in the project are how to define a 'group of researchers' and who is responsible to define a group of researchers? In our view the universities should be responsible to define research groups, but should be assisted by the funding organisations. From the viewpoint of a funding organisation, it is perhaps not decisive if a department chooses to divide itself into five or seven groups.

A consequence of the proposed system is that detailed reporting on resource spending will be omitted. Our experience is that today's system is designed primarily to meet legislative demands and that the received information is not much used, partly due to the lack of quality. Control against fraud may be as well organised in other ways, e.g. through a system where accountants do random visits. The Swedish National Audit Office has informally expressed its interest in the proposed new approach.

Status

A working group recruited both from universities and funding organisations has developed a questionnaire and a data base structure. The system is presently being tested at a number of universities (pilot test). The decision on its implementation, based on the results of the pilot exercise, is expected to be taken soon. Its implementation in all Swedish universities might be realised in 2007. We expect that it will last about three more years before the system will be fully functioning and accepted by the research community.

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Stefan Hornbostel

New Approaches for Research Information and Quality Assurance: IFQ evaluates DFG funding activities

What about results and success of German research? Do collaborative research centers really perform better than traditionally funded projects? Do funding programs for young researchers reach their target group?

These are some questions, with which the newly founded institute is occupied. The IFQ (Institute for Research Information und Quality Assurance) is designed to be both (1) a scientific research institute and (2) a center, which evaluates funding activities and advises the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) on the development of new funding instruments. This is an unusual range of tasks for an evaluation agency. The reason is that there are so many evaluations at different levels that the marginal profit of additional evaluations is reduced considerably. In our opinion, it is rather necessary to use already available data about research facilities more efficiently. Even administrative data could be leveraged for evaluative purposes. The IFQ works closely with the DFG and reverts to s its database, which it will analyze and extend.

The IFQ has been founded by the DFG as a "central research facility". In the beginning, the institute will concentrate on the development and testing of suitable instruments, which will provide information about the effects of DFG's funding programs and about the extent to which the DFG reaches its own agenda. In the long run, the IFQ will also extend its field of activity to include other partners and tasks.

After there has been a blocking of reforms in Germany in the nineties, German federal governments started to increase the autonomy of universities and research facilities. They expanded the framework for action, which contains now more and more free market- and competitive elements. As a consequence, all actors increasingly publish indicators, key data and qualitative information about their research activities. Drawing conclusions from these data, they also build up internal management systems (e.g. research information systems of universities, web portals or internet-based information of funding agencies). However, this information is very heterogeneous, not coordinated and often gathered several times. In the long term, the IFQ will contribute to systematize and improve this supply of information.

Besides long-term monitoring and evaluation of the DFG funding activities and provision of information on the results of research funded by the DFG, other objectives of IFQ's activities will be the analysis of general developments in the national and international area of scientific research, as well as improving the networking of information resources.

Three fields of work result from these objectives: Firstly, the provision of general information about actors, projects, results and success of scientific research in Germany, for example with the aid of database-supported information systems; secondly, the permanent observation of developments in the field of publicly funded research on the basis of a set of key data and indicators. Thirdly, the IFQ will use data, which it will obtain through monitoring processes and special surveys, to check the degree to which the objectives of funding programmes have been achieved.

The directorship of the institute is accompanied by a university appointment at the Humboldt University of Berlin to maintain a close link to university research. This joint appointment is intended to ensure close integration between the IFQ, university research and the training of young researchers.

To develop the scientific research in Berlin into an internationally visible cluster, the Social Science Research Center Berlin, the Berlin-Brandenburg Academy of Sciences and Humanities, the Humboldt University of Berlin and the IFQ have jointly established the "Berlin Centre for Science and Evaluation Research" (Berliner Zentrum für Wissenschafts- und Evaluationsforschung).

Plans about the foundation of IFQ started in a time of intensive reforms in the German higher education system. In 1999, a report by an international review-panel was presented. The reviewers concluded that the German research system lacked a system of "continual monitoring" and that the DFG lacked a "self-motivated quality assurance system." Furthermore, in terms of European and world-wide comparability, the report on research and its future development is of ever-increasing significance. In Germany, the focus of consideration was traditionally on input data. In the nineties it started to move more and more towards output indicators. There is an increasing need for output indicators with respect to the evaluation of results and performance comparison of research programmes and institutions. This was one of the driving forces for the foundation of the IFQ.

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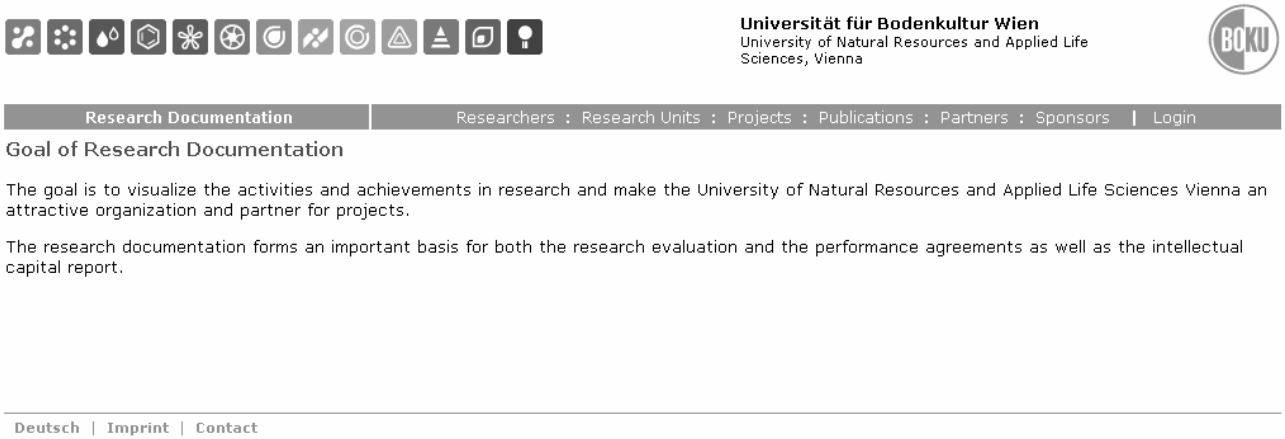
From Research Documentation to a Research Information System

Introduction

In the last years strategic information about research has become more important for universities and scientists, but also for policy makers and the economy as such. Therefore, research databases play therefore a major role concerning the planning and coordination of research projects, the search of cooperation partners and in particular the allocation of budgets or for the stimulation of performance on the university's level. Today, research databases linked to the world wide web represent an integral part of a modern information infrastructure in universities. They are an important data basis for both the interested public and for knowledge transfer (PR).

The University of Natural Resources and Applied Life Sciences, Vienna (BOKU) was the first Austrian university which used web-linked forms for the acquisition of research data in combination with an underlying ORACLE database. The whole information (only excluding budget and confidential data) can be searched in the public web-interface of the BOKU research database (see fig.1). Of course the whole "classical" research performance data are collected since the late ninety-nineties. These are project data, publications and scientific community services. Special features of the BOKU research database are services like 'request for reprints' or 'specific queries for generating research reports'.

Figure. 4: BOKU Research Database,
homepage: http://bokudok.boku.ac.at/ bokudok/en_research_ database.search



BOKU and partners

In 2005 the BOKU research support office was able to win the Medical University of Graz and the University of Veterinary Medicine Vienna as cooperation partners who started to use the BOKU research database for their own purpose. The primary goal of this cooperation is to develop the research database into a research information system which is coordinated by a jointly appointed advisory board.

The developmental of the information system is planned by a working group consisting of specialists in the fields of research funding, research management, research evaluation and controlling, who have to fulfil similar tasks based on the University Act 2002. Some of these tasks are performed in an almost identical way at each of the three Universities, whereas others show a high degree of individualism.

The analysis of the underlying operational procedures leads to a raw formulation of the technical solution, which is then finalized in conjunction with our software engineers, yielding to an optimized user oriented design. Thus, the working group is acting task-focussed and not product-oriented. Finally, the consortium is not marketing-oriented, but invites other universities to join and cooperate.

Cross-linking of information and applications

The rectorate emphasized the necessity of data integration.. All available information should be collected in databases, simultaneously avoiding data redundancies (single point of truth). Thereby, the research database, SAP and other databases (e.g. personal, education) are combined by using a data warehouse. Consequently, the rectorate decided that the research database should act as a ‘pre-system’ of SAP (s. below).

Current features, mainly at BOKU

At BOKU the research database is used as a ‘pre-system’ to SAP. Every new research project (and also every other kind of third-party funded activity) has to be collected in the research database first. Having collected and saved the core data, the SAP-internal order is generated automatically. This information is verified by the financial -controlling staff and then uploaded into SAP by using a defined interface. This process guarantees that all data which are necessary for documentation purposes are collected and that all data are available for strategic decision making or evaluation procedures on both, the department and the university level.

By linking the research database with SAP it is also possible at BOKU to export all data for fiscal balances. Within a few weeks after the turn of the year the all necessary documents can be submitted to the auditor.

Strategic analyses at BOKU

BOKU is running strategic analyses for different purposes. These are:

- analyses for decision-making for the rectorate, university management, department management and controlling
- performance contract, development plan
- evaluation procedures (from department to personal level)
- surveys by law (e.g. Research & Development, energy survey [IEA])
- internal and external communication: Intellectual Capital Report
- etc.

New features – partly in development

Project-portfolio-management-tool:

In order to provide an effective internal transaction and administration of research projects a project-portfolio-management-tool was designed.

This tool allows mapping and thus monitoring of the whole project live-circle, from the initial project idea, the planning-period, internal notification and approval, external application and approval, the active phase of the project up to finalisation/closure.

Integrated reporting features offer time depended overviews regarding e.g. notified, approved or active projects

Project calculation and financing preview

Researchers at BOKU have to calculate their planning data when having acquired a new research project (e.g. personal expenses, infrastructure, material expenses, and overheads). Again, the planning data will be uploaded into SAP by using a defined interface. Thus, controllers, but also project leaders will be able to prove planning and actual data at every time of the project and are able to react on variances. A mid-term goal is the import of SAP-data from BOKU's datawarehouse into the research database. Yet, the SAP-data are already daily exported from the Federal Computing Centre of Austria to a BOKU server. Thus, researchers will be able to check their planning data and current status of expenses from everywhere in their well known research database environment– the only necessity is to have a browser and there is no need for a SAP gateway.

Referencing of publications

Linking publications to their counterpart in "public" databases like Science Citation Index (ISI, Thomson Scientific), Pubmed (National Library of Medicine), or to the full text in the respective journal verifies the accuracy of the entry in our database and offers further information (e.g. abstract, citation counts, full text options).

Quality control (e.g.)

The design of the database aims at a prevention of erroneous data entries (e.g. use of pre-defined short lists, distinct identification of scientific journals and their "impact"). In addition, quality control tools were designed to facilitate search and correction of incorrect data without having the necessity to be an expert in pl/sql-programming.

Evaluation tools (e.g.)

Science Citation Index covered publications are linked to journal information such as Journal Citation Report Subject Category (ISI, Thomson Scientific), and respective Journal rankings as and citation counts, yielding bibliometric information for evaluation purposes.

On the other hand a new portal to run queries for evaluation procedures at all levels (university, department, institute, working group, single researcher) is planned and will be implemented within this year. Thus, it will be easy to support these processes with different performance indicators and with benchmark indicators that refer to the university or department level, or to pre-defined groups of researchers (e.g. professor level).

Summary

Taken together, the BOKU research database has developed over the years form a mainly documentation oriented tool into a modern research information system as a part of the university's data warehouse, providing the broad range of users (from the individual internal or external researcher to university administration and university management) with an up do date solution for the demanding tasks of a today's (and tomorrows) university.

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Franz Haselbacher

What is TUGonline

TUGonline started in 1997 and had the global goal to set up an all inclosing campus wide information-management system for our university. The main idea of the project was to build a system that treats lecturers, researchers an especially students as valuable customers of our university and therefore supports them with a state-of-the-art customer-service. The customers should benefit from this system in the following ways:

- No more need to move physically to a department to get or put some information
- No more loss of service because of closed doors due to opening hours of departments
- No more need to transfer or duplicate data on different media. The system is the source.
- No more paper on notice-boards presenting out-of-time data. The system publishes.

This input implicated a system that should support high quality in communication and workflows between all members of the university. The guidelines below - today known as “personal intranet portal” – were the way we wanted to go to reach that quality:

- each member should get a personal, up-to-date view on the university, its data and services
- by looking at dynamically generated data from a database
- using personal authentication
- with single-sign-on mechanism (one-time authentication for all further services and actions)
- anytime, anywhere (in the Web)
- on a secure way (using SSL)
- with guaranteed response time (lower than 7 seconds)
- and high reliability (24 hours x 7 days)

To satisfy the needs above we had to design a new access- and data-model with the following constraints:

- All data should be integrated in ***one*** database.
  keeping different databases up-to-date causes a lot of manpower.
- Every data item should exist ***only once***, no duplicates, no transfers.

  This implicated the design of ***one*** data-model, that should include at the end all tables and relationships of all resources of the university.
- Sata should be managed at the source by the authorized person.

  When data is produced it should be put directly in the system, no cache on other media. Management privileges on organisation's data should depend on a person's rights in that organisation.

Research at Graz University of Technology (TU Graz)

The synthesis of research and high level teaching represents a fundamental philosophy at Graz University of Technology and is maintained through all areas of basic and applied science and engineering. As one of the leading universities in central Europe TU Graz is part of a worldwide network of cooperating universities, research institutions, and industrial partners (for details look at www.tugraz.at/forschung).

The research profile of TU Graz is formed by:

- Outstanding interdisciplinary key research areas
- Excellent faculties and institutes active in a broad field of science and technology
- Impressive research projects, several Christian Doppler Laboratories and centers of excellence, and the business incubator Science Park Graz
- The R&T House, which offers professional services and assistance for scientists and represents the communication platform for science, economy, politics, and society.
  The R&T House is formed by the units:
  - Research Management
  - Technology Transfer
  - Technology Exploitation Office
  - Forum Technik und Gesellschaft & alumniTUGraz 1887

TUGonline - the actual state

We started the project in January 1997 and during the first year we designed and implemented the kernel of the system using the new data- and the access-model. We went into operation with TUGonline in January 1998. Over the years new applications were added to the system and by now the system offers a large number of services and management tools to different groups of persons.

The data-model

The design of the data-model started from scratch with the goal to build *one* model including all resource-tables with each item *only once*. The model now has the size of about 900 tables and is still growing. The full knowledge on the model gives us the opportunity to act or react very flexible to requirements.

The access-model

The access-model was designed to give a large flexibility in the assignment of rights to persons. It allows us to build a central-managed but also a decentralized managed system and we are able to migrate dynamically from one to the other when business-rules at the university change.

It consists of five layers:

- **Data** defines the database with its tables and relationships
- **Programs** are resource-specific applications that access data
- **Rights** define privileges for using a program in a specific way. Each program has its own rights (for example “read” or “edit”)
- **Roles or functions** belong to an organisation and are usually resource-specific (for example “asset management”). Each function is assigned to one ore more rights (the above function could be assigned reasonable to the right “edit” of the program “asset management”).

  Functions are also assigned to identified persons. The relation between functions and rights as well as functions and identified persons is a ‘many to many-relation’ which allows a maximum of flexibility in setting up the system. One can build a centrally managed system by just defining a few multi-purpose-functions in the top level organisation and assigning all rights to them. On the other hand, one can build a very decentralized managed system by defining many resource-specific functions in lower level institutions of the university and assign the respective rights to them.

- **Identified persons** are real persons known to the system by unique usernames and passwords. The granting of username/password as well as the assignment of functions to staff is managed in the departments. Students get a TAN at first entry and later on demand at the admission-office.

Program technology

In TUGonline there are three types of applications:

- **Web-application** for staff and students
  We are using PL/SQL as interface to the database together with HTML and JavaScript. Sessions are made unique by using session-cookies that are only stored in memory.

- **Web-FORMS-applications** mainly for the administrative staff
  ORACLE's FORMS technology allows to develop on a higher level with more functionality

- **REPORT-applications** for staff and students
  Those applications allow the easy generation and presentation of reports mainly as PDF files by using ORACLE´s REPORT technology.

User Interface

- **Presentation layer**: We have developed presentation-modules to generate HTML-pages in a structured way, so that each page gets the same look. The page structure consist of header, navigation, body (including list- and mask-elements) and footer (see view below). With this concept we are able to modify the layout of the whole system very comfortable. To freeze text sizes we are using cascading style sheets.

- **Views and APIs:** We have implemented public views and APIs (application programming interfaces) as interface to tables of main-resources. Now we are able to change table-structures and just have to take care that APIs and views deliver the same data as before.

Below you see a student's entry point in the system, where he gets a view on his "personal University's Desktop" including the functions and services he is allowed to use.

Figure 1: Example of a student's entry point

Applications concerning Research Documentation

The current system (please take at look at http://online.tugraz.at) covers the management of all resources of our university except

- budget,- and staff management, that is done with SAP HR & FI/CO
- library management that is done with Aleph-Library system.

From the users' point of view the system supports all kind of management activities except those that need a written signature. The integration of a smartcard system in TUGonline in the near future will allow to integrate processes that need digital signatures.

Below you find a detailed list of all actual services and management tools concerning research documentation grouped by user profile (students, staff, and persons with functions in a department)

Services and management tools for students:

- documentation of abstracts of Diploma-, Bachelor-, Master- or Dissertation-theses including tutor and referee, as well as full-text-integration (upload) of the theses;
- access to a database of external companies and Institutions that have relations concerning research to TU Graz.

Services and management tools for Researchers:

- documentation own functions in research-projects and -areas;
- management of supported Diploma-, Bachelor-, Master- and Dissertation theses;
- management of personal publications;
- management of all kinds of achievements and awards in research & education;
- access to a database of external companies and institutions that have research relations to TU Graz.

Services and management tools depending on a person's functions at a department:

- document functions of all persons in department's research-projects and –areas;
- management of supported Diploma-, Bachelor-, Master- and Dissertation theses;
- management of personal publications for all department's members;
- management of all kinds of achievements and awards in Research & Development for all department´s members;
- access to a database of external companies and institutions that have research relations to TU Graz.

Services and management tools for administrative departments concerning research:

- different query-tools to extract research data concerning
  - research projects and areas,
  - publications,
  - achievements and awards;
- public views on all kinds of research data.

- Transparency

  Making all our resource-data - except sensitive personal data – available to each member of our university and in the global internet leads to a level of quality of data that was never reached before.

- Management at the source

  Being able to maintain data directly by responsible persons in the Web keeps data up-to-date and accelerates workflows.

- Single point of administration

  All services and management tools (except SAP- and Aleph-tools) are presented in one single "personal university desktop"-window. The offered applications are dependent on the user´s profile (student, researcher, lecturer, alumnus, external person). "Single sign on" technology allows offering all features on the "university desktop" without further authentication using username/password.

- Consistent look and functionality

  In many university-information-management systems people are managing resource-data with different tools using different user-interfaces. In TUGonline all management tools and services are presented in the same look with the same base functionality (navigation, window-management), which implies a "corporate university identity" in the system.

The European Context

The mobility of researchers, lecturers and students in Europe is increasing. One condition for being attractive concerning education is the fully integration of the ECTS (European Credit Transfer System) as we have done in our university. TUGonline incorporates the whole ECTS-management including the automatic generation of the documents (transcript of records, diploma supplement). Furthermore TUGonline presents the TUG information package including ECTS-attributes. With all these features this system opens our university as an e-campus to all attendants in the sense of coordinated higher education in Europe (Bologna declaration and follow up).

Evaluation of achievement-indexes

In TUGonline we have an integrated database-structure for research (see view below) that supports different evaluations

- Evaluation of Austrian wide standardized University achievement-indexes in the areas of research and education (so called “Wissensbilanz”). These indexes have to be delivered once a year to the Federal Ministry for Education, Science and Culture.
- Evaluation of additional achievement-indexes in the areas of research and education for Graz University of Technology itself. One index concerning education is evaluated per single person and is shown to the person himself on the “personal university desktop”. A second index concerning research is planned this year.

External Organisations

External organisations are a key factor in research-documentation and have the following attributes

- they are categorized in different areas like company, university, ministry, etc.
- each external organisation exists only once as a record in an appropriate table
- they have to have high quality in data, that means: name and full postal address
- they can be managed decentralized by the possessing internal organisation
- a check-routine for duplicates warns of inserting an external organisation twice

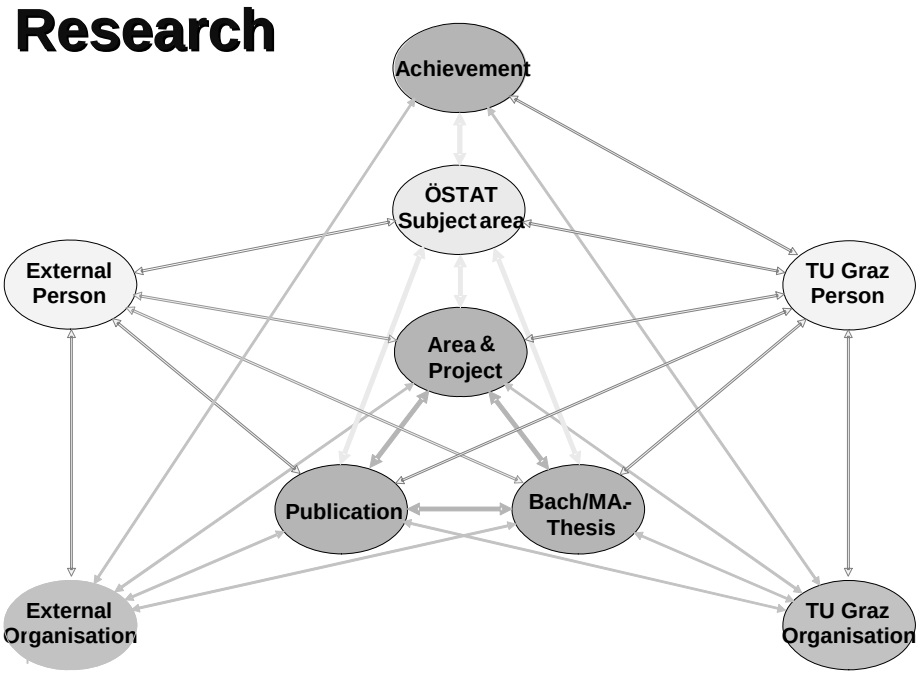
With those constraints we can build relations to external organisations from different applications, like

- cooperation or funding in research projects
- fundraising
- external relations (contacts)
- contracts

Regarding all relations to an external organisation we can get a “profile” of it and furthermore we can use that information to do better CRM (Customer Relationship Management).

Below you get a view on the data-objects in the system and their relations concerning research. Please notice the relations to external organisations and persons.

Figure 2: View on the data-objects in the system and their relations concerning research



Source: TU Graz

Quality of data

To perform quality assurance, make evaluations and support strategic decisions in a efficient way you have to rely on high quality of data in the sense of referential integrity, which is hardest to reach, but also in the sense of actuality and completeness.

To reach high quality results (evaluations,…) one needs high quality in the following areas

- tools for evaluation and presentation (datawarehouse tools)
- aggregated data-structures (DWH-star-structure)
- raw data as the basis for aggregated structures

To reach high quality in raw data you need to achieve quality of data in all areas of the university

- SAP (staff & budget),
- research & education
- all other resources (room, assets, …)

That can only be reached by

- making public of data in the Web
- dynamic integration of database-information in homepages (using webservices)

- decentralized management at the source
- integration in *ONE* all inclosing system concerning data-model, management and presentation

How the system is applied to other universities

In the year 2002 a customized version of TUGonline called CAMPUSonline has been set up to satisfy the needs of other universities in Austria. CAMPUSonline has been improved continuously since then in cooperation with 4 other universities also running the system

- Montanuniversität Leoben
- Universität für Musik und darstellende Kunst Graz
- Universität für Musik und darstellende Kunst Wien
- Mozarteum Salzburg Universität

By summer 2006 CAMPUSonline will be running on 5 additional universities in Austria

- Universität Graz
- Medizinische Universität Graz
- Akademie der Bildenden Künste Wien
- Universität für künstlerische und industrielle Gestaltung Linz
- Konservatorium Wien Privatuniversität

For 2007 a few more Austrian universities plan co-operations.

Awards

In 2003 TUGonline won two awards,

"EUNIS-Elite-Award for Excellence in implementing Administrative Information Systems for Higher Education in Europe". EUNIS is the association for encouragement of European university information management systems.

Award of the Austrian National University Board as best system in the category “Management Information Systems”.

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Fodok – Research Documentation at the University of Salzburg

Fodok (FOrschungsDOKumentation) is the Research Documentation at the University of Salzburg. Developed and maintained at the University of Salzburg it stores information related to all aspects of the university's research activities. Fodok includes exclusively data that are reported by academics concerning their own research activities. Database management and quality assurance are handled by the Department of Research Promotion (Abteilung für Forschungsförderung).

Fodok 1 – Centralised Data Entry

The project 'Fodok' has been started in 1999. Until then, there was no central documentation of the university's entire research activities. University departments had stored information on research activities in different databases, annual reports and yearbooks. 'Uni-Online', the university's first information system, documented exclusively research projects and publications. Consequently, the intention was the development of a research documentation database that should standardise the documentation of all research activities in a single database and deliver a query system for institute reports.

By 2001, the University of Salzburg had established one of Austria's largest research databases. Cooperation contracts with the Universities of Vienna and Graz included the implementation of the database at these universities and the acknowledgement of common development in the future.

Fodok was not only a collection of research achievements, but offered also possibilities of data management: certain data could be retrieved online from the Fodok-website. Password protected access provided institute reports, publication reports, project reports etc. Since 2000 Fodok has attracted increasing importance, as the database provided the basis for the peer-review-evaluation of the university's four faculties (2001-2003).

Data entry occurred centralised at the Fodok-helpdesk. Research relevant data were reported by the researchers themselves to the Fodok via email. Fodok-staff would then enter the data manually. This procedure provoked errors due to miss-understandings or typing mistakes. Once in the database, the data were hardly editable for researchers. In some research areas, Fodok could not provide current data any longer and soon achieved a reputation as a data 'graveyard'.

Fodok 2 – Decentralised Data Entry

Obviously, data editing was Fodok´s main problem. In March 2003, the project 'Fodok 2 - Decentralised Data Entry' started. The aims were to develop an online data entry interface that allows the university´s academics to enter and edit data concerning their own research activities. This application should run on every computer with internet access without the need of installing additional software. For this reason it had to be made sure that only authorised persons would gain access to data. Data entry and editing had to be as easy and comfortable as possible so that every researcher should be able to work with Fodok without any special training.

In 2003, large-scale changes at the University of Salzburg interfered with the development of 'Fodok 2'. According to the University Organisation Act 2002, the departments were restructured. It was not only necessary to represent the structure of the university in the database, but the Fodok-Team had to find a way to attribute research activities to different organisation-units, e.g. research projects which had started at a single department that now had been split into three new departments. It had to be ensured that upcoming project reports would attribute these research projects to the correct organisation unit.

Another claim was the managing of contractual research projects. According to the University Organization Act 2002, researchers have the duty to inform the university's rectorate about contractual research projects. The idea was to store all project-relevant information in a single university-wide information system. Any person occupied with contractual research projects (project leader, head of department, university administration staff) should gain access to the same data. This should generate synergy effects and save labour. For the Fodok-team, this task was a huge challenge: A workflow had to be developed that manages several administration steps. It had to be ensured that especially financial information is only displayed to authorised persons. A policy administration system was developed which regulates access to the data. Before the research project has been certified by the rectorate´s office, the data are displayed exclusively to a specific group of authorised users. When the project is finally authorised, the data concerning the project are – with the exception of financial information – accessible to anyone on the university's web site.

The original concept of Fodok was that every scientist is responsible for his / her research data in the database and would manage the data entry and editing on his / her own. This procedure turned out to be not practicable. So an authentication and policy management system had to be developed for delivering requirements for different and varying user groups.

Finally, it had to be accepted that the aim to find a uniform standard to document the university's research activities was impossible to reach: With its four faculties (Faculty of Catholic Theology, Faculty of Law, Faculty of Arts and Humanities, Faculty of Natural Sciences) the University of Salzburg covers a wide spectrum of research areas. The requirements of the four faculties were too different – especially as far as the citation styles of publications were concerned. Therefore, the concept for the forms of data entry was adapted in order to be able to consider different formats for citation in the future.

All these unpredictable requirements prolonged the duration of the project. Finally, in spring 2005, 'Decentralised Data Entry' went online. Although there was no training course, the researchers used the 'Decentralised Data Entry' intensively from the start. Especially the possibility of editing the data was widely acknowledged. Due to a close collaboration with the Department for Controlling, upcoming contractual research projects are now managed by Fodok.

In addition to supporting the university's administration, Fodok plans to provide additional benefits for each academic. A first step is the export of data from the database into the academics' homepages. In a pilot project, an interface was developed for the Department for History and Political Sciences. Any changes in Fodok are immediately displayed on the department's homepage. Every entry on the homepage publication list links to the appropriate entry in Fodok, where the data can be edited and new entries can be added.

Fodok 3 – Quality Assurance Management

Plans for future research documentation include the establishment of an information management system for evaluation and benchmarking. Besides providing the university's administration of research projects and offering access to the university's achievements in research Fodok is about to become a 'Quality Assurance Management System' which will provide a resource for various reports according to knowledge survey („Wissensbilanz"). As a reporting system, it should also consider the needs of academics e.g. individual reports of research activities.

These requirements are going to be implemented by the project 'Fodok 3'. Fodok 3 has been started in November 2005 and will be completed by December 2006.

For further in information on Fodok3 please visit:
http://www.sbg.ac.at/aff/service/fodok.htm

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Klaus Zinöcker

New Frontiers in Evaluation – Conference Announcement

April 24th – 25th 2006, Radisson SAS Palais Hotel, Vienna, Austria

The evaluation of long-term scientific research is about to experience new challenges. Policy makers are increasingly aware that the success of their efforts to finance and promote long-term research is not only dependent on individual programmes, institutions and infrastructure, but also on 'portfolios' of programmes which interact. Therefore it becomes more important to co-ordinate the existing programmes and to consider new methods for measuring the efforts of individual instruments as well as portfolios of instruments. Evaluation can help policy makers to deal with these challenges. However, to get the most from evaluation, institutions such as the evolving European Research Council (ERC) may need to contribute to the further development, implementation, and application of modified and extended methods of evaluation and selection processes suitable for today's complexities.

The conference "New Frontiers in Evaluation" will bring together policy makers, programme managers, evaluation experts from a variety of disciplines, and managers of science funds from around the world for two days of intensive exploration into current best practices--and beyond--in selection processes and evaluation methods geared towards the complexities of multiple levels of decision making and interdependent science program portfolios.

Registration

Registration is open until April 1st 2006. The number of participants is limited; participants will be accepted on a first come–first served basis. The conference fee is € 360.—incl. VAT covering participation, luncheons and a conference reception. For further information concerning the conference and accommodation, please refer to the address given below. Papers and further information on the conference will be made available on the conference web page.

CONFERENCE ORGANISER

Plattform Forschungs- und Technologieevaluierung

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Conference Programme

New Frontiers in Evaluation

Monday, April 24th

8.00 – 9.00	Registration
9.00	**Welcome Address** *Rupert Pichler*, bmvit & Platform fteval (A) *Christoph Kratky*, Austrian Science Fund FWF
9.15 – 9.50	**Best Practices and the New Frontiers** Irwin Feller, Senior Visiting Scientist, American Association for the Advancement of Science and Professor Emeritus, Economics, Pennsylvania State University (US).
9.50 – 10.40	**Raising Expectations:** *What we can expect from the conference* Chair: Michael Stampfer, WWTF (A) with session chairs: Arnold Schmidt, Ole Fejerskov, Jakob Edler, Edvard Kobal, Wilhelm Krull, Helga Nowotny
10.40 – 11.00	Coffee Break
11.00 – 12.00	**New Frontiers?** Chair: Ken Guy, WiseGuys Limited (UK) Philippe Laredo, PREST and ENPC (F): The Realm of Tools Used Dorothea Sturn, FFG (A): What we would like to hear: The Users' View
12.00 – 13.15	**Lunch Break**
13.15 – 16.15	Parallel Sessions

Session A: Selection Processes

Chair: *Arnold Schmidt, Vienna University of Technology*

A 1) *Nick Vonortas, George Washington University (US)*: Real Options

A 2) *Elise Brezis, Hebrew University of Jerusalem (Israel):* Randomization: An optimal mechanism for the evaluation of R&D projects

A 3) *James Dietz, NSF (US)*: Transformative Research: Conceptualization and measurement"

A 4) *Christiane Spiel, University of Vienna (A), and Hans Westmeyer, Freie Universität Berlin (D)*: Creativity: How innovative ideas and products emerge

Rapporteur: NN

Session B: Complexity

Chair: *Ole Fejerskov, Danish National Research Foundation*

B1) *Susan Mohrman, University of Southern California (US)*: A Multi-Level Examination of the Impact of New Institutions on The Global Network of Nano Science and Engineering R&D

B2) *Andreas Wildberger, FFG (A)*: Additionality and Funding Agencies: Opening the Black Box

B3) *Laurent Bach, BETA (F)*: Current reforms in the French evaluation systems: the growing role of indicators and measurement of PROs' TT activities

B4) *Björn Vroomen, CBP (Nl)*: Extending the Dutch R&D tax credit program: does it work? Evaluation of two changes in the Dutch R&D tax credit program

Rapporteur: NN

Session C: Portfolio Evaluation

Chair: Jakob Edler, Fraunhofer ISI

C1) *Rosalie Ruegg, TIA Consulting*: Portfolio Evaluation: Toward a Common Evaluation Methodology for Making Funding Decisions

C 2) *Andreas Schibany, Joanneum Research, and Leonhard Jörg, Technopolis Austria (A):* Evaluating the Austrian R&D Programme Portfolio

C 3) *Deborah Duran, NIH (US)*: NIH Program Performance Monitoring System: A Centralized Online Performance Assessment Tool

C 4) *Verena Groß, RIW Essen (D):* Conceptual Challenges of Evaluating the Impacts of a Sizeable Technology Programme Portfolio

Rapporteur: Sybille Hinze, DG Research

16. 30 – 17.00 **Rapports from the Sessions**

NN, NN, Sybille Hinze

17.15 – 18.30 **Break Out Session**: Looking forward, looking back on the Concept of Additionality

Hugh Cameron, PREST (UK): The Counterfactual Paradox and the Methodology of Evaluation
Jan Larosse (European Commission): Additionality in Public Funding of long-term Scientific Research
Rahel Falk, WIFO (A): Quantitative Methods to measure Additionality: State of the Art
Jerry Sheehan, OECD

19.30 **Conference Reception**

by invitation of the Lord Mayor of Vienna, Dr. Michael Häupl, at the City Hall Vienna

Pre - Dinner Speech: Stefan Kuhlmann, Fraunhofer ISI

Tuesday, April 25th

8.00 – 9.00 Registration

9.00 **Welcome Address**

Klaus Zinöcker, Platform Research and Technology Policy Evaluation (A)
Birgit de Boissezon, European Commission

9.10 – 9.40 **Key Note**

Luke Georghiou, Manchester University (UK)

9.40 – 12.30 Parallel Sessions

Session D: Evaluation Processes

Chair: Edvard Kobal, Slovenian Science Foundation (SL)

D 1) *Yang Huilan, W.K. Kellogg Foundation (US):* A Four-Step-Model of Initiative Evaluation

D 2) *Frederick Kijek, DeCallière Research Associates, and Reza Ghazal, Ottawa University (CA):* A quantitative economic performance evaluation methodology for public R&D programs

D 3) *Emanuela Reale, Ceris CNR (I):* Review for the evaluation of the academic research: the Italian experience

D 4) *Nadine Rons, Vrije Universiteit Brussel (Bel):* Reliability of Peer Review Ratings and their Correlation with Bibliometric Indicators

D 5) *Jennifer Birta, NRC Canada:* Methods and Uses of Peer Review – Challenges and Lessons Learned From a Canadian Perspective

D 6) *Youngsun Baek, Georgia Tech (US):* Publishing Productivity of US Academic Scientists and Engineers: An Empirical Examination through Data Envelopment Analysis

Rapporteur: Neville Reeve, DG Research

Session E: Evaluating Systems

Chair: Wilhelm Krull, Volkswagenstiftung (D)

E 1) Gretchen Jordan, Sandia National Laboratories (US): A Framework for Evaluating Diverse Portfolios of Scientific Work at Project, Portfolio, and National Systems Levels

E 2) Benedetto Lepori, Università della Svizzera italiana (CH), and Michael Dinges, Joanneum Research (A): Public Project Funding of Research Activities - National Differences and Implications for the Establishment of a European Research Council

E 3) Erik Arnold, Technopolis (UK): Systems Evaluation: The European Perspective

E 4) Alessandro Maffioli, Inter-American Development Bank (US): Meta Evaluation of Public Funding of Basic and Applied Research in Latin America

Rapporteur: NN

Session F: Talking about Success

Chair: Helga Nowotny, WZW (A)

F 1) Göran Melin, Swedish Institute for Studies in Education and Research: Effect of Funding young promising scientists

F 2) J. Bradley Cousins: Non-academic Impact of Research through the Lens of Recent Developments in Evaluation

F 3) Nikos Kastrinos, European Commission: Evaluating the impact of European Research in the social sciences and humanities

F 4) Antonio Garcia Romero, Agencia Lain Entralgo (ES): Exploring the Societal Returns of Research within Hospitals

F 5) Stefan Hornbostel and Saskia Heise, IFQ (D): Is success divisible? How to evaluate success successfully?!

Rapporteur: Andreas Fier

12.30 – 13.30 Lunch Break

13.30 – 14.15 **Users' Perspectives and Questions ahead.** Panel Discussion

"….what's the emerging S&T policy agenda, towards which evaluation research should be directed?"

Chair: Rosalie Ruegg

Georg Winckler, Rupert Pichler, Enric Banda, NN

14.15 – 15.15 **Evaluation: The Scientists' point of view**. Panel Discussion

"…I do not care to be understood or appreciated by a typical occidental scientist, as he does not understand the spirit of my writings"

Chair: *Erik Arnold*

Andre Gingrich (Social Anthropology Unit, Austrian Academy of Sciences), *Rainer Blatt* (Univ. Innsbruck), Eda Sagarra (Trinity College, Dublin), NN

15.15 – 15.45 **Rapports from the Sessions**

Andreas Fier (Chair), Neville Reeve, NN

15.45 – 16.00 **Closing Remarks**

Gerhard Kratky (FWF), Wolfgang Polt (Joanneum Research)

Der Newsletter der Plattform Forschungs- und Technologieevaluierung GesbR
ist ein unregelmäßig erscheinendes offenes Forum zur Diskussion methodischer
und inhaltlicher Evaluierungsfragen in der Forschungs- und Technologiepolitik.
 ISSN: 1726-6629

Herausgabe und Versand:
Dr. Rupert Pichler, Dr. Sonja Sheikh, Mag. Klaus Zinöcker
Plattform Forschungs- und Technologieevaluierung GesbR,
A-1090 Wien, Währingerstraße 3/15a, office@fteval.at

Für den Inhalt dieser Ausgabe verantwortlich:
Plattform Forschungs- und Technologieevaluierung GesbR
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PLATTFORM Forschungs- und Technologieevaluierung fteval

PLATTFORM FORSCHUNGS- UND TECHNOLOGIEEVALUIERUNG

Die Plattform Forschungs- und Technologieevaluierung GesbR ist eine Initiative der folgenden Organisationen: Österreichisches Bundesministerium für Bildung, Wissenschaft und Kultur (bmbwk), Bundesministerium für Verkehr, Innovation und Technologie (bm:vit), Bundesministerium für Wirtschaft und Arbeit (bmwa), Österreichische Forschungsförderungsgesellschaft mbH (FFG), Fonds zur Förderung der wissenschaftlichen Forschung (FWF), Joanneum Research, KMU Forschung Austria, ARC Systems Research, Technopolis Austria GmbH, Österreichisches Institut für Wirtschaftsforschung (WIFO), Wiener Wissenschafts-, Forschungs- und Technologiefonds (WWTF) und dem Zentrum für Innovation und Technologie GmbH (ZIT), Rat für Forschung und Technologieentwicklung, AQA – Österreichische Qualitätssicherungsagentur, Christian Doppler Gesellschaft (CDG), Austria Wirtschaftsservice (awsg).
Im Rahmen der Plattform werden Themenstellungen zur Forschungs- und Technologieevaluierung erarbeitet und – z.T. unter Einbeziehung namhafter ExpertInnen – in einem Fachkreis diskutiert. Der Newsletter beinhaltet Fachbeiträge zu Fragen der forschungs- und technologiepolitischen Evaluierung. Die Herausgabe erfolgt in zeitlicher als auch inhaltlicher Abstimmung mit Plattform-Veranstaltungen, um die Synergiewirkungen eines breiten Austauschforums zu nutzen.

"new frontiers in evaluation"

Conference

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