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Research support services in Higher Education and Research Institutions: approaches, tools and trends

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Abstract

Which are the trends that are transforming research management and how do research organizations respond to these changes? What are the available services to support research during EC projects' life-cycles? Are there research information systems in use and to which extent are they integrated? The paper is structured as follows: a survey conducted over a sample of universities and research centers in Italy is presented in section 2. Section 3 describes significant case studies. Section 4 illustrates mobility figures and trends in EU funded projects. Section 5 concludes with considerations about trends and suggestions for improvement. © 2014 The Authors. Published by Elsevier B.V.

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1. Introduction

Changes in Research & Innovation during the last few years have been prompted mainly by events which affected our economy and society, both globally and in Europe. To contrast our continent's decreasing competitiveness, Europe has strengthened investments in Research and Innovation, first with the 7th Framework Programme, and subsequently with Horizon2020.

More recently, Italy has paid more attention to research funding opportunities, both at central level and as for each individual institution. Furthermore, in 2013, the Ministry of Education, Universities and Research of Italy

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(MIUR) has adopted Horizon 2020 Italia (HIT2020)¹, a strategic document with the twofold aim of aligning national research strategies to the priorities identified by European Union and coping with specific critical points at national level. Such critical points are represented by low capability of mobility and transfer of Italian researchers, whose competences mainly consist in knowledge and research techniques in their specific scientific sectors, to the detriment of other skills and activities. Italian researchers are lacking in transversal skills such as research management, search for funding opportunities, networking, dissemination and exploitation of research findings through knowledge and technology transfer activities (i.e. patenting, licensing, spin off creation).

Research support services are, in many cases, not adequately developed in most universities and public research organizations.

Regarding this last aspect, however, there has been a significant improvement, with an increasing number of institutions increasing their investment both in human resources devoted to research support services, and in Information Technology tools for the collection and management of internal information regarding projects. During the 7th Framework Programme, the Italian Agency for the Promotion of European Research (APRE) played a key role in training staff and researchers of universities and public research organizations on Project Cycle Management, through several seminars and courses.

Research support services are a relatively new area in which different competences converge. These services represent a test-bed for experimentation of new approaches in management and project life-cycle support. Their task can vary from giving support to the development of new ideas and research proposals, to the scouting of funding opportunities, from the proper research activity , to the dissemination and publishing of research findings.

Being strongly information-related, research support services benefit from Information and Communication Technologies, where Current Research Information Systems (CRIS) represent tailored solutions, conceived to support organizations where research is performed, funded and assessed². Part of these activities are usually performed in the so-called Research Offices or International Relationships Offices. In times of financial stringency, it is vital to increase skills in the search for funding opportunities; it is also necessary to rethink processes and services needed to operate efficiently and in a cost-effective way. In addition to their role in the realization of the European Researchers Area, these services also contribute in supporting researchers' mobility as well as in implementing the European Charter for Researchers.

2. Which Research Support Services in EU funded projects Life Cycles?

A questionnaire was conceived to analyze how research support services are organized in dealing with EC funded projects life-cycle. The questionnaire was distributed to key people, personnel working in research offices and/or international affairs offices of selected universities and research institutions of Italy. A sample of 12 institutions was formed; it consisted of universities with both high and low performances and research institutions according to their dimensions and awareness of EC funding issues. All key people involved responded spontaneously or solicited. The collected data were analyzed.

The questionnaire consists of 24 questions grouped into 4 sections. Main questions are reported in Appendix A. The first section deals with organizational aspects; it is aimed to analyze which activities are performed in the research offices and which approaches are adopted - from passive to aggressive ones - to stimulate the organization in reacting to funding opportunities. A second set of questions addresses the Information Technology tools in use to find out which, if any, CRIS - Current Research Information System is present and which functionalities it implements i.e. paper repository, projects database, research products database, etc. The questions had also the goal to verify the presence of a software aimed to manage and monitor requests coming from "the internal customers", i.e. professors, researchers as well as offices in the organization.

The third section investigates the features of the information system in use: is it proprietary? Open source? Internally or externally developed? Is it freely accessible from the institutional website?

The fourth section refers to communication and dissemination, aiming to understand which information find room and resonance in the institutional website, focusing on impacts both inside the institution, with a multiplier effect, and outside, with a reputation effect.

Most of questions are closed-ended; just a few are open, those used to describe requirements and/or margins of improvement. Figure 1 illustrates main activities performed by the Office. More evidences are described in³.

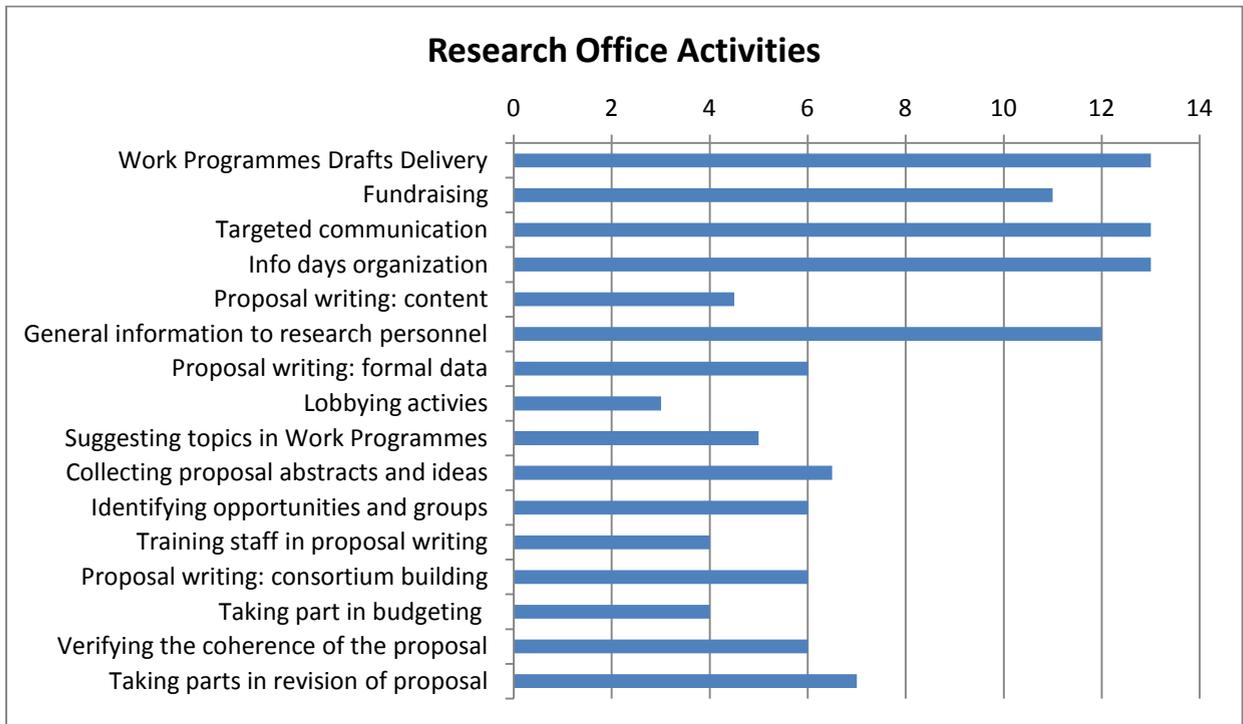


Fig. 1. Main activities performed by the Research Office. Frequency in the analyzed sample of 12 organizations. From [3].

Results show the presence of mixed situations, in which a unique information system composed of different modules is adopted, or in which several and different software are in use, in some cases even not integrated.

Most represented functions are the repository of research outputs, the database of publications and the database of projects. Solutions include U-GOV^{4,5}, SURplus⁶, actually on the way of being updated in the new Institutional Research Information System (IRIS) by CINECA⁷, D-Space⁸, ShareScience⁹,... and also ad-hoc internally developed software. In most cases the institutional website is manually updated and only a part of the stored data is dynamically on-line published. At a general level, interviewees express the need for greater integration between different information platforms and software programs in use in different offices, as well as for greater interoperability and integration of information, which is variously managed, with the corporate website as a main institutional window and communication tool.

3. Case studies

3.1. Ca' Foscari University of Venice

Ca' Foscari University of Venice is defining new strategies to approach the European funding landscape, recruiting outstanding and highly motivated researchers through their participation in individual funding schemes like European Research Council (ERC) Grants, Marie Skłodowska-Curie Actions (MSCA), Funds for investments in fundamental research (FIRB), Scientific Independence of young Researchers (SIR). The last two are funded by the Ministry of Education, Universities and Research of Italy (MIUR).

In accordance with the EU Human Resources Strategy for Researchers¹⁰ (HRS4R), Ca' Foscari supports the activities of researchers at an early stage of their career, i.e. those having up to 7 years of research experience since completion of their PhD, or up to 10 years since their Master's degree. Not only the research fellows who won ERC, FIRB, SIR, or Marie S. Curie Grants will be directly recruited, but the same chance will also be given to ERC Starting/ Consolidator Grants winners who choose Ca' Foscari as Host Institution. In evaluating applications to

internally funded research fellowships, priority will be given to researchers who, in the last 2 years, have presented a project proposal in ERC, FIRB, SIR or MSCA schemes and passed the threshold. An additional 5% of funding for research activities will be given to fellows who are carrying out independent projects.

Such an aggressive policy, at least considering Italian standards, is aimed to attract and recruit the best researchers, and to promote their international mobility. Ca' Foscari University of Venice is pursuing a paradigm shift from the "brain gain/brain drain" vision to the "brain circulation" one.

To be attracted, international researchers must be enabled to find, in few clicks, all the data they need about research areas, publications, ongoing projects, research staff involved, vacancies, support given. All this information must be integrated, updated, and in English. The update of the "funded projects" webpage, as well as the matching between the competences of international incoming researchers and the faculty members' ones is now processed by an officer. A fully integrated CRIS would fasten the procedures and free human resources for other strategic activities (1 person full time equivalent).

3.2. INGV, Istituto Nazionale di Geofisica e Vulcanologia (National Institute of Geophysics and Volcanology)

Thanks to its long term continental leadership in Earth Sciences, INGV recently established as the reference institution for several international research infrastructures. The most recent Piano Nazionale della Ricerca (PNR, Italian National Research Plan) refers explicitly to two outstanding INGV infrastructural projects as essential components of the "Environment" sector of the ESFRI roadmap (European Strategy Forum for Research Infrastructures): EPOS - European Plate Observing System and EMSO - European Multidisciplinary Seafloor & water column Observatory.

INGV is reorganizing some of its offices and structures, with the aim to increase the level of support granted to all scientists for all their administrative needs, to favor their initiatives and to promote their creativity. A new, dedicated Projects Office has been recently setup, with the specific aim of assisting institute and personnel with the development of proposals to obtain research funding through externally sponsored programs. The objective is reached through wide range of activities like to identify calls of interests, harmonize administrative procedures during all life-cycle phases, identify critical points in financial management of each project, bridge the gap both between the three scientific Departments (Strutture) and Central Administration both among different offices of Central Administration.

Moreover, a strategic goal is the progressive adoption of an Enterprise Resource Planning (ERP) system. As member of the 3rd institutional cohort for the implementation of the HRS4R, INGV is on the way to continue the process of defining a HR strategy with possible outcomes in attracting outstanding researcher for MSCA, as well as improving internal working conditions.

3.3. OGS, Istituto Nazionale di Oceanografia e Geofisica Sperimentale (National Institute of Oceanography and Experimental Geophysics)

In the last few years OGS has been developing policies aimed at enhancing its successful participation in the European R&I programmes, by combining this with another horizontal priority, namely the enhancement and internationalization of human capital. This has resulted in a number of concrete initiatives, primarily the establishment of the Research Promotion and International Cooperation Office, managing specific actions for the promotion and internationalization of research activities, in particular those related to European funds.

In this context, the new governance of the Institution is strongly committed to the implementation of strategies based on three main pillars: implementation of support services customized for the specific needs of researchers, reinforcement of integration between the Central Administration and the four Sections (Research Departments) of the Organization, improvement of internal awareness and monitoring of the on-going project activities. Consequently, a new informative system integrated with staff management system as well as with accounting system (able to monitor all the phases going from the project idea design to the management/reporting of the project) is being currently implemented.

As mentioned, the valorization and internationalization of human capital is another cross-cutting priority of OGS. This implies a particular attention to policies and actions aimed at supporting both incoming mobility (such as direct

recruitments of high level and renowned researchers; promotion of OGS as host institution for ERC grant beneficiaries as well as for Marie Skłodowska-Curie Actions fellows; implementation of high quality incoming services for international fellows and outgoing mobility (stays and fellowships of OGS researchers at prestigious foreign institutions for the enhancement or diversification of their competences). These initiatives perfectly comply with a clear strategy for ensuring researchers' career development: this strategy has been implemented at OGS in the last few years accordingly with the Human Resources Strategy for Researchers proposed by the European Commission. As a consequence, OGS is the first and currently the only research institution which has been granted in 2013 the Commission acknowledgement "HR Excellence in Research".

4. European projects: trends and mobility figures

In conjunction with the recent launch of Horizon 2020, it seems interesting to draw a synthetic overview of the participation of Italy in previous EU funding programmes. Such data can help us in identifying weaknesses of Italian participation and consequently actions to improve Italian access to such funding programmes.

Considering the V, VI and VII Framework Programme, Italy is ranked as fourth country in Europe, as for the proposals submitted and funded, following UK, Germany and France. The trend of the Italian performance, i.e. the percentage of grants obtained has decreased over time: from a share of 9.4% in FP5 to 8.4% in FP7, probably due to the increased competition generated by the opening of the FPs to the new Member States. The spread between Italian contribution to the EU budget and the overall grants obtained within VII FP is negative for Italy (-3.9%); Germany is close to the balance, while the UK has a positive return equal to +4.4%. The success rate of proposals upon Italian coordination (12.3%) is lower than the overall European success rate of proposals (15.9%). In the Seventh Framework Programme, Marie Curie Actions are the only case in which the Italian success rate exceeds the European average. Nevertheless the alarming fact is that 78% of the mobility concerns Italian researchers going abroad, compared to 22% of foreign researchers choosing to come to Italy. In the ERC grants Programme, the success rate is particularly low in Italy (3.2%), much lower than the European average (14%). The Italian researchers funded are 154 - among which 65 Advanced Grants and 89 Starting Grants - and 86 of these are hosted by foreign institutions. Please note that this data - taken from the document Horizon 2020 Italy ¹ is updated to December 2012 and therefore does not consider the results achieved in 2013, the last year of the Seventh Framework Programme for R&D in the EU.

The lack of clear strategies and of strong investments in human resources and infrastructures and the difficulties of the national context are the main weaknesses that characterize the Italian scientific institutions and universities.

5. Conclusions

To conclude, the growing importance of participation in European projects is clearly confirmed. As a consequence, there is an increasing need for tools to support this participation in an optimal way, with accuracy, transparency and efficiency. The following actions can effectively increase the Italian participation to EU programmes.

National level:

- The development of an Italian R&I system complementary and consistent with the European one
- The coordination of ministries, local administrators, programme experts, both at national and European level;
- Achieving a critical mass and promoting consultations among different national stakeholders to identify ideas and common priorities;
- Active and continuative participation in the process of defining objectives and drafting programs;
- Reducing "barriers to entry", harmonizing national regulations to the EU ones (i.e. salary levels, visa issues, compulsory procedures to buy equipment or to hire staff members).

Individual institution level

- Defining clear strategic choices, based on the identification of specific disciplinary sectors and types of funding programmes on which to bet and rely on;
- Genuine daring to invest adequate resources for the development and qualification of support services in order to foster participation to EU Research & Innovation funding programmes.

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Appendix A. Main questions of survey about Research Support Services

- Which are the main activities performed by the Office?
- Is the Office aware of those performance indicators which determine funding from Ministry of Education and Research? If yes, are there guidelines to optimise performances?
- Is there a system of incentives?
- Is there a system to monitor expenditures during the project?
- Is there a system to monitor person months?
- Are there young researchers responsible for EU funded projects?
- Which activities would the Office perform, if provided with more resources?
- What would you suggest to improve Office organization?
- Does a research information system exist to collect and manage information about personnel, projects and results? If yes, please specify the name. If yes, which are its functionalities?
- Does a software to register, manage and monitor the "internal customer", i.e. researchers, professors, other Offices... exist? If yes, which are its main functionalities?
- Is the research information system (or software in use to this aim) open source or proprietary? in house or externally developed? Public or internal?
- Does the institutional website contain information which is dynamically extracted from institutional databases? If yes, which information?
- What would you suggest to improve the information system in use?
- Which kind of communication is in use for active projects? Internal, external? In collaboration with Press Room?
- Does the Office publish information about calls, guidelines to submit proposal etc... in the website?
- What would you suggest to improve the institutional website, in particular for EU funding opportunities?

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