



THE VALUE OF BIOMEDICAL RESEARCH WITHIN THE TRANS2CARE NETWORK, AND RECOMMENDATIONS FOR THE CREATION OF TOOLS TO PROMOTE AN EFFECTIVE TRANSFER AND EXPLOITATION OF KNOWLEDGE

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1 THE TRANS2CARE QUESTIONNAIRE AND ITS RESULTS

In order to measure the degree of awareness of the issues related to the exploitation of intellectual property, research output and monetization of intangible assets of companies, universities and research institutions, a questionnaire (Appendix 1)² has been sent to a list of subjects inside the Program Area³, in which, after a brief presentation about the importance and extent of the Trans2Care Project (also "T2C"), the importance tied to the completion of the questionnaire has been widely stressed as well. Here below, in order to facilitate a better understanding of the responses, the reader will find all the various sections of the questionnaire with the relevant questions. Each section, after a brief explanatory introduction, contains the most important information provided by those who have submitted the questionnaire. This methodology (i.e. the use of a questionnaire), adopted to gather relevant information for the drafting of this work, has been already successfully tested in other projects⁴ but on this occasion did not generate the same quantity of results.

At this point it is necessary to highlight that unfortunately there is a caveat, in fact, the response to the questionnaire was unsatisfactory, which caused us not to be able to collect sufficient data for statistical purposes, but at the same time it made possible to confirm the hypothesis from which the work originated, that is, that there is indeed a divide between research and its exploitation, and between

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2 → The questionnaire in appendix is just in English, but all the recipients in Italy received the Italian version thereof.

3 → Please note that for the purpose of drafting this report, the term "institution" will generally refer to universities, research centers and companies.

4 → Performed by the author of this work in the U.S., and Japan for projects related basically to the same scientific field.

industry and the themes linked to academia and research. To understand how pervasive this problem is, it should be enough to mention that at the end of the data collection phase for the preparation of the present report, there have been several difficulties in obtaining fully completed questionnaires by the project partners, in fact, even among those which have been submitted, some are incomplete. The results of each section of the questionnaire are shown after the tables containing the questions, and they report the data relevant to T2C's partners first, followed then by the responses of the subjects outside of the T2C project. Within this subgroup, the responses are then divided according to the nation of the respondent between Italy and Slovenia.⁵

To complement the survey's results, at least as far as the academic world is concerned, some of the findings contained in the latest NETVAL report (published in 2014)⁶ are provided to confirm that in terms monetization of research results, Italy is definitely lagging behind. In 2012, the universities that participated to NETVAL's questionnaire (49) reported 289 patent applications,⁷ obtained 201 patents,⁸ and spent approximately EUR 2.6 million (approximately EUR 57 thousand for each university, on average)⁹ to maintain an overall patent portfolio (which also includes patent applications) equal to 3,356 units (68.4 patents/applications per institution, on average).¹⁰ Revenues from licenses and options in 2012 totaled approximately EUR 309,900,¹¹ with an average value equal to EUR 7600 per institution. The number of licenses and/or options entered into in 2012 was equal to 61,¹² equal to 1.3 per university. Numbers, in general, that keep Italy way below the European average, as also pointed out in the mentioned report.¹³

Section 1: protection and monetization of the research output

In this first section of the questionnaire, questions relating to the protection of intellectual property that might have been generated and its monetization have been asked to the recipients. This is definitely a section of the questionnaire potentially applicable to all types of respondents, which could have filed patent applications, and monetized them after the issuance of patents or even during the prosecution of the applications. The only exception was contained in the last question contained in this section, in fact, this was referring to contracts commissioned by third parties, which are basically applicable only to research institutions / universities and Contract Research Organizations ("CROs"), rather than to companies which are committed to developing products on their own.

Questions

- To gain full knowledge of any invention generated by your institution, are you using invention disclosure forms¹⁴ as the one attached to this questionnaire?¹⁵ If not, why?
- Pending patent applications (total)
- Patent applications filed in the last year

5 → To be more precise as to the nature of the respondents and their number, an I.R.C.C.S. (i.e. research and cure institution), and a company in Italy, and, as far as Slovenia is concerned, a university, and a company.

6 → Available at the following URL: <http://www.netval.it/contenuti/file/Rapporto%20Netval%202014.pdf>

7 → Ibidem, pp. 383-386.

8 → Ibidem

9 → Ibidem

10 → Ibidem

11 → Ibidem

12 → Ibidem

13 → To further understand the theme of knowledge transfer at the regional level (i.e. Friuli Venezia Giulia Region), please consider the opportunity to read the book, in Italian titled "Lo scambio della conoscenza: il valore dei legami università-territorio", edited by Clara Busana e Susanna Zaccarin (EUT, Edizioni Università di Trieste, 2012).

14 → Documents usually adopted by universities and research centers to ensure that researchers can transmit to the competent office (usually the Tech Transfer Office) all the information relating to the potential invention they might have conceived.

15 → Not present in Annex 1.

- How many patent applications are international or otherwise extended outside Slovenia?
- Patents granted (total)
- How many of the granted patents have been licensed or assigned?
- What are the revenues from licensing and/or assignments?
- How many contracts with third parties (i.e. work for hire) have been signed in the last year?

Responses from T2C partners: at the top of the list in terms of figures, predictably, there are academic institutions. All university partners use disclosure forms to create a dialogue between their researchers and the internal office, which is supposed to deal with the filing of patent applications (and, more in general, with the management and commercialization of the intellectual property generated within the institution), with the sole exception of the University of Primorska. The hospitals, as it might be expected, do not use invention disclosure forms. In terms of granted patents, the Slovenian partner universities report lower numbers (with the exception of the National Institute of Chemistry, with 30 granted patents) than the Italian ones, where the University of Udine ranks first (81),¹⁶ followed by Trieste (53), and Ferrara (19). Unmatched in terms of performance, however, is the International School for Advanced Studies (also "ISAS"), declaring 17 operations, between assignments and licenses, in favor of its 17 granted patents, with revenues of just over EUR 50 thousand in the 2011-2013 period. Finally, it is also worth mentioning the answer provided by the University of Venice which with 2 patent applications, reported revenues for approximately EUR 75000¹⁷ (deriving from licenses/assignments) and the ones from the University of Primorska and Venice, which declared to have signed, respectively, 51, and 59 contracts (for commissioned research) in the past year. This question, referring to the number of contracts for commissioned research, has been left blank in many instances because of the likely difficulty in finding a definitive number by consulting all the departments potentially involved within any given institution.¹⁸ Predictably, the hospital partners, have all stated that they had no income generated from patents or contracts commissioned by third parties.¹⁹

Responses from external subjects: at the Italian level, the CRO Aviano National Cancer Institute ("CRO") affirmed that they indeed use invention disclosure forms with researchers for the submission of potentially protectable ideas and to have a patent portfolio characterized by excellent performances. The other Italian entity also declared excellent results, with 5 patents (and 7 patent applications) and revenues of several hundreds of thousands of euros, always generated from licenses or assignments. As far as Slovenia is concerned, the university responded by providing outstanding figures, even when compared with the most profitable examples from the U.S. In fact, 39 applications generated 34 deals, which led to licensing agreements or assignments. Finally, the company declared a single patent application together with 3-5 consulting contracts entered into with third parties.

Section 2: Activities aimed at the further development of knowledge

The second section of the questionnaire concerned the activities carried out for the "exploitation" of the intellectual property that may be created within each institution. Once again, the question dedicated to consulting contracts entered into between the institution and third parties (i.e. work for hire) was more relevant to the activities carried out by research centers and universities, while the other questions were indeed compatible with all types of institutions, which run research projects.

16 → Data extrapolated from the submitted document, which describes the active portfolio, including patent applications and granted patents until 12/31/2012.

17 → Figure that seems to be overcome solely by the University of Udine, which reported revenues in excess of EUR 300 thousand in 2011-2012, resulting from licenses/options. This data has been extrapolated from the report submitted by the university on the basis of a questionnaire received by the university for another project.

18 → Denoting the same time as it is essential that data such as those required in the questionnaire are available in an easy manner and, above all, to be made public for statistical purposes and to measure performance of the institution.

19 → With the exception of the Blood Transfusion Center in Slovenia, which is the holder of two patents, one of which is licensed.

Questions

- Do you have an intellectual property (development) policy within your institution? If the answer is “yes”, what’s its nature?
- When executing contracts with third parties (i.e. work for hire), how is the intellectual property that may be potentially conceived during the performance of research activities managed?
- Do you have any internal resources that are responsible for the management of the intellectual property within your institution?
- Do you think intellectual property be an important asset or you do not take it into consideration within your institution? Do you have an internal policy governing this matter?

Responses from T2C partners: in this section of the questionnaire, all partners have considered intellectual property an important matter, and almost all of them have or are about to adopt ad hoc internal regulations and policies. In terms of contracts with third parties (i.e. work for hire), it seems that there are some basic principles shared by all of the respondents, but also cases in which each transaction is dealt with on a case by case basis depending on the situation, and the nature of the other party or other cases in which the parties abide by standardized forms and adhere to general principles which are set in existing policies and regulations. Some partners (e.g. the Hospital of Nova Gorica and the Orthopedic Hospital of Valdoltra) do not have a dedicated resource to the management of intellectual property matters, even though they do consider the topic very important.

Responses from external subjects: at the Italian level, CRO has proven to be one of the leading institutions in terms of importance given to the development of intellectual property (and this also sanctioned by its membership, as only Italian IRCCS, within NETVAL). CRO also mentioned its by-laws as the leading source of the commitment towards technology transfer (in addition to the internal regulation titled “Technology Transfer of research results”),²⁰ and also reported all the activities carried out in this area. The other Italian respondent has also proven to be fully aware of the matter, and to have the human resources and internal policy required to manage any IP issue. As far as Slovenia is concerned, the academic respondent declared that they do have an ad hoc regulation as well as internal resources to professionally manage any intellectual property that may be potentially generated within the institution. Finally, the company declared not to have any specific policy about it, but rather to act on a case-by-case basis and to consider the matter also important as a marketing tool.

Section 3: Measurement of the scientific/ technology output

The third section of the questionnaire concerned the pure measurement of the scientific and technology outputs in terms of publications, research projects, products and innovations reaching the market. The last two questions of this section were more likely to be responded by companies rather than by universities or research institutions which by their very nature, with the exception of potential spin-off ventures, would not have the opportunity to enter the market with their own products.

Questions

- Number of publications (approx.) in peer-reviewed journals generated by the staff of your institution in the last 3 years (2010-12)
- Number of funded research projects in which your institution was an applicant in the past 3 years (2010-12)

²⁰ → For more information about this, please visit the following CRO’s webpage: http://www.cro.sanita.fvg.it/ricerca/txt_technology_transfer.htm.

- Number of new products introduced in the last 3 years (2010-12) by your institution
- Number of incremental or radical innovations introduced by your institution in the last 3 years (2010-12)

Responses from T2C partners: this is perhaps the section of the questionnaire with the most interesting answers provided by the respondents. As we might have expected, health-related institutions have not reported impressive figures, even though the I.R.C.C.S. Burlo Garofolo declared a very large number of publications in peer-reviewed journals (400) and 10 new products introduced in the market during the 2010-2012 period. The Slovenian partner universities have declared more or less similar numbers in terms of publications in the three-year period (i.e. several hundreds), with a peak reached by the National Institute of Chemistry, which declared 628 publications. The Italian partner universities that have achieved the highest figures in the ranking are: Ferrara (3702), Trieste (2902) and Venice (1479). Moreover, it is worth mentioning the response of the University of Venice, which declared a staggering number of introduced new products in the last three years equal to 71 (equivalent to the number of research projects carried out in the same period) when almost all the other respondents considered the question not applicable to them (understandably, especially in those cases in which the respondent was an academic/research institution) or reported much lower figures. Finally, worth mentioning, the response of the University of Primorska that declared to have facilitated the introduction of 5 radical (or incremental) innovations in the mentioned three-year period.

Responses from external subjects: as far as Italy is concerned, it is necessary to highlight the brilliant performance of a healthcare provider. In fact, CRO declared to have conceived, in the three-year period (2010-2012), 610 publications, conducted 120 research projects (top figures in absolute terms) and introduced four products in the market (figures that would be interesting even for an academic institution). The company also reported interesting numbers with 12 publications in three years. As far as Slovenia is concerned, the university reported outstanding figures with 1569 publications and 215 funded research projects in the period in question (as for this last number, the institution topped the ranking of all the respondents). Lastly, as to the company responding to the questionnaire, despite having declared no publications in the period at hand, it reported to have introduced two new products in the market in the last three years.

Section 4: awareness of external projects in the field of knowledge development and monetization

The fourth section of the questionnaire related to the degree of awareness that the surveyed institutions might have about national and international projects in the field of knowledge (and IP) development and monetization.

Questions

- Do you any of the projects related to knowledge development and monetization either at the national or international level?
- Do you know the project called iBridge?
- Do you know the project called EasyAccessIP?
- Do you know any platform offering patent intelligence services and patent search tools such as Collective IP?

Responses from T2C partners: in general, it seems that, with the exception of the healthcare providers

(to which the projects listed in the questionnaire are almost totally unknown),²¹ the other parties have responded positively proving to be aware of such “experiments”. In this regard, it should also be mentioned that one of the T2C partners is an organization called t2i - Technology Transfer and Innovation, which is “the new consortium for innovation, a newco promoted by the Chambers of Commerce of Treviso and Rovigo in which activities, projects, human resources and infrastructure of Treviso Tecnologia and Polesine Innovazione - the two special branches promoting innovation of the Chambers of Commerce of Treviso and Rovigo - are going to be integrated. Services being offered by t2i are aimed at the development of a corporate culture focused on innovation, through the creation of educational projects, and full development of pilot projects which might be funded at the national or international level.” Therefore, within the group of T2C partners and also for those outside of the project, t2i stands as a potential partner to facilitate and/or accelerate the innovation process within a public or private institution.

Responses from external subjects: as far as Italy is concerned, the two respondents provided opposite responses. While the healthcare provider declared to be aware of the initiatives mentioned in this section of the questionnaire, the company said it was not not. As to Slovenia, both the university and the company responded positively, declaring to know almost all the projects mentioned in the questionnaire.

Section 5: future projects aimed at the development and monetization of knowledge

The fifth and final section of the questionnaire was designed to measure the degree of interest of the surveyed institutions as to the possibility of joining new or existing projects, which aim at creating a more integrated and more efficient knowledge transfer ecosystem.

Questions

- Have you ever tried to join consortia or platforms to monetize or make otherwise available the patent portfolio or know-how of your institution? If not, are you planning to do it in the future?
- If there were a Slovenian platform to foster knowledge transfer activities, would you be interested in participating to the initiative by providing data relating to your patents and know-how to help your institution monetize them?
- If there were a platform like the one referred to in the previous question, what kind of services would you consider appropriate or necessary?
- Do you think that your institution would be willing to pay for a service like the one described in the two previous questions? If the answer is “YES”, how much?
- Do you believe that the researchers working for your institution would appreciate such a service? If not, why?

Responses from T2C partners: in general, universities (and some health care providers) responded favorably about the potential use of platforms to monetize and/or make public the patent portfolio, and know-how of the institution. Some of them are also willing to pay a fee to be able to join. As to the nature of the required services, top sought-after features seem to be the following: periodic information on technology and partnership requests, industry statistics and features increasing the possibility to find opportunities for interaction between companies that are interested in seeking available technologies and the institutions who can provide them. It is also worth noting, in this regard, that t2i - being an organization that aims at promoting innovation - has been working and it is currently working on projects such as those mentioned in this section of the questionnaire.

21 → With the exception of the Hospital of Nova Gorica that declared to be aware of some of the most popular tools for IP development and monetization.

Responses from external subjects: as far as Italy is concerned, the two respondents gave diametrically opposed answers. In fact, while CRO declared to be in favor of initiatives such as those described in the questionnaire, as long as they are provided at no cost, the company has given a negative response, showing no interest in this kind of projects. As far as Slovenia is concerned, the university has shown some interest, and it also stated that the current procedures are definitely sufficient. The company has expressed a positive opinion as well, and highlighted that for startup companies such a service should have a low price and have some credibility at the national level.

2 PROPOSALS FOR DEVELOPING AN EFFECTIVE KNOWLEDGE TRANSFER SYSTEM

This section describes some opportunities that could be implemented with somewhat ease to the benefit of the Program Area (and beyond) being the tools in question primarily related to access and use the Internet, therefore, practically accessible from everywhere.

2.1 Knowledge transfer through online portals

The following paragraphs illustrate some examples, that became real initiatives through entrepreneurial efforts or have been carried out by public institutions, which show that the use of networks and online tools may facilitate the circulation of knowledge, its use and monetization. The various opportunities will be explained according to the following order; firstly, open innovation portals will be examined; secondly, additional experiments that combine the open innovation paradigm to crowdsourcing practices will be examined.²²

2.1.1 Open Innovation portals

Open innovation, as defined by Professor Chesbrough (Berkeley), is “a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology.”²³ This paradigm is particularly favored by the the growth of exponential technologies (those that partly relies on the exponential growth of Information Technology), the dematerialization of working boundaries and by the need to get the best solution for a given problem exploiting the (virtually infinite) external resources which are available outside any organization. A proposal for a new tool for accelerating innovation and its “exploitation” may, for example, relate to the creation of an ad hoc portal in which the access would be primarily granted to companies willing to seek resources and products outside their corporate boundaries through the creation of profiles with specific requests, for not too specified needs, also in order to maintain a certain degree of confidentiality, and not to expose themselves against potential competition. If a system in which all the needs of companies are categorized by macro technological areas were created, then it would be easier for providers of products, services, ideas and technologies, to directly contact the company in question and submit a proposal that is theoretically compliant with what has been requested. Specifically, such an example would bring measurable benefits to the relation between the two distant worlds of “research” and “industry”. In fact, the so-called “death valley” (that is, the moment in which technologies developed by universities and research centers do not find an opportunity to enter the market and remain unused, and most of the time incomplete and not ready to be marketed), which is linked to a significant waste of human resources and money, might be tackled by a tool such

22 → According to Wikipedia (translation from the Italian page), crowdsourcing is “a business model in which a company or an institution relies on for the design or development of a project, idea or object by engaging an indeterminate and unorganized group of persons.” For more information: <http://it.wikipedia.org/wiki/Crowdsourcing>.

23 → Chesbrough, Henry William. *Open Innovation: The new imperative for creating and profiting from technology* (2003), Boston: Harvard Business School Press.

as an open innovation portal in which all technology and expertise requests are easily accessible by researchers. There are already some examples of open innovation corporate portals in the world such as the one developed by P&G in the U.S. that has gained a lot of success since its establishment. The advantage of universal portal though (compared to those created by a single company) would feature the added value of having many different companies and industry areas “under one roof”, thus increasing the number of requests for solutions and therefore resulting more attractive to the providers of skills, technologies, etc. One of the biggest problems of the Internet in terms of “facilitation” of the innovative process is linked to the huge and (most of the times) uncoordinated dissemination of information. The creation of a single portal (at least national in scope, but if conceived as a continuation of the T2C project, it should be at least cross-border)²⁴ embracing the open innovation paradigm should be an experiment in which it would be necessary to pay much attention to the barriers that exist within the knowledge transfer process, such as the linguistic one. A multi-country portal, for example, should be necessarily in English, which is the de facto most widespread language in the world. Possibly, a portal in Italian might have some degree of success (if the Italian market were the target), but on the other hand it would be able to attract only those who are able to read and understand Italian, therefore decreasing the potential of the tool itself and the paradigm of open innovation as well. As a matter of fact, in the medical, biomedical and pharmaceutical fields, even more than in other sectors, the use of the English language should be almost mandatory as it should be recognized that this idiom plays a universal role in this fields nowadays. Moreover, the opportunity for a company to express their needs in these areas of research would also give the opportunity to the providers of technologies and skills (i.e. academic and research institutions) to better understand what the real market needs are, which would constitute a solution that would save a lot of work and resources by avoiding any duplication of research and/or unnecessary intellectual speculation on topics that the market is not interested in. Moreover, the principles of open innovation can be employed in the health(care) world in the very same way in which they have been applied up to now to cope with business demands, with mixed forms of collaboration, which might somehow involve the public sector. An example of a similar opportunity is offered by Edison Nation Medical,²⁵ which defines itself as an “healthcare incubator and an online community that cares passionately about creating more effective, more efficient and safer healthcare through innovation”. Edison Nation Medical has introduced an open call in these days on its website to collect all the ideas and inventions which may be somewhat beneficial to all those who suffer from arthritis.

EdisonNATION MEDICAL

Arthritis Care: Improving the Quality of Life For Arthritis Sufferers

JUL 14 **Deadline:** Monday, July 14, 2014 at 11:59PM Pacific Time.

Submit Idea
Create your Edison Nation account for free
It only takes about 10 seconds.

Tell your friends about this opportunity:

Tweet 1 Like 0

Open call for arthritis. Source: Edison Nation Medical²⁶

24 → In fact, limiting an open innovation portal to only certain countries (by using a specific language, for example) would run counter the very principles of open innovation as it would allow some sort of openness, but it would remain geographically limited. The most desirable solution, then, unless there were specific commitments relating to the creation of single-country portal, is to proceed with a project at international level, (also) by utilizing the English language.

25 → For more info, see Edison Nation Medical: <http://edisonnationmedical.com/about>.

26 → To see the full description of the call, go to http://edisonnationmedical.com/live_product_searches/ENMEDICAL454.

In this case, the incubator will assess the value of the ideas submitted and then try to bring the winning solution on the market, sharing with the winning proponent any royalties from the use of the selected product or tool. This is just one of the possible ways in which open innovation, which in the last presented case intersects the realm of crowdsourcing (more on this later), can be beneficial to human health. To this end, in fact, there might be consortia comprising several companies willing to use a single tool or other forms of open innovation portals managed and sponsored by government agencies only. Mixed forms might be conceived too, but they would probably be somewhat difficult to run as they should create a perfect balance between public and private interests.

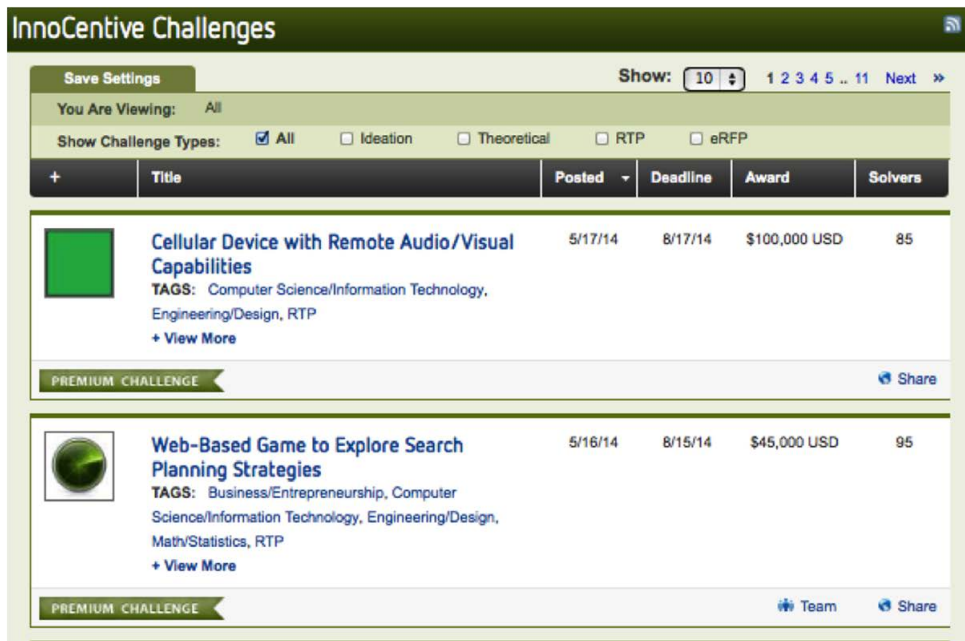
2.1.2 Open Innovation: challenges, and other proposals

A further form of open innovation tool that gained a lot of attention and success since the early 2000s has been carried out mainly by North American companies, such as Innocentive and Innovation Exchange, to name a few, that have as their primary goal the research of solutions, mainly (but not only) to technological problems that are defined in advance by their clients (mostly companies, but not only them, engaged in various sectors: agriculture biotechnology; computer science; engineering; physics; design, etc.). The winning solutions are then rewarded with monetary prizes.

InnoCentive’s homepage. Source: InnoCentive ®

There are several differences between these cited examples and other tools being used to achieve open innovation, which may also include the management of the innovation process by confining the activities to closed communities. In this case, for example, requests for solutions are always routed to various groups (and that it is why we are still talking about open innovation), but these groups are selected by the service provider, that will make only the members of those (closed) groups aware of the specific request. Instead, in the previous cases, (e.g. Innocentive and Innovation Exchange), their portal serves, among other things, as a database for challenge briefs (i.e. technical/business “problems”) for which companies (and public institutions) are willing to pay to post them and get a solution by any

person or team in the world, registered to the portal. Here the open innovation paradigm perfectly intersects the realm of crowdsourcing and it reaches its full potential. Moreover, the benefit of having a neutral market place of innovation, where potentially everyone could actually participate by creating a request for a solution, is beneficial to those who want to keep their name and/or nature undisclosed. In fact, for a company, most of the times (but not always), it might be fundamental to avoid disclosing information about their ideas and business strategies, and this could be hardly prevented if the requests were posted by using a corporate portal. As mentioned, the portals in question display challenges with a final award at the end of the evaluation period, which consists of a sum awarded to the individual or team that will eventually be selected by the client as the winning one. The incentive to participate in a challenge, that sometimes involves quite substantial awards, it is clear and the challenges are, in fact, able to attract up to thousands of potential solvers sometimes, who engage in providing a solution to the problem stated by the client of an open innovation marketplace.



Some examples of challenges. Source: Innocentive®

The benefit associated to the use of a portal providing this type of services is self-explanatory for a company. In fact, with an almost “negligible” amount of energy and resources (which of course does not take into account any efforts made prior to the challenge), a company could have the opportunity to receive thousands of solutions, from everyone, from everywhere. This means, translated into concrete terms, that the sponsor of a challenge could benefit for several months (this is the time usually given to the potential solvers to submit a solution) from an R&D pool consisting of thousands of individuals who have an unbiased and fresh vision towards the problem as opposed to the resources in the ranks of the company sponsoring the challenge. If we wanted to go beyond this business model, we could try to find a way in which demands might find a solution by taking advantage of the already conceived and available knowledge, therefore avoiding unnecessary and costly duplication of efforts. In fact, it might well be that technology demands could be answered by providing already existing solutions, which are not yet (that) known. At this moment existing knowledge comes into play. As a

matter of fact, many, perhaps the majority of companies in the world are not aware of what is being conceived in (all of the) universities and research centers around the world. The language being used to communicate this information is certainly one of the major barriers to overcome since it is impossible to transfer effectively information if the potential recipient is not able to decrypt and understand the content of the communication. Additionally, large companies that have begun to outsource their research efforts through academic collaborations usually speak directly to the pool of institutions that are generally recognized at the global level for their results and reputation, not considering most of the other solutions, which originate from organizations belonging to lower tiers. The most desirable solution, therefore, is probably linked to the creation of open innovation portals which should allow a free registration to researchers (and more in general to potential solvers), so that the latter could take advantage of the opportunity offered by a company to unearth some of the existing knowledge, which could ultimately become a real product or industrial process. Believing in an imminent and massive registration activity with an open innovation portal it is indeed desirable yet rather difficult to imagine in the short term, and for this reason that one of the activities to be performed by tech transfer offices within universities and research centers should be to constantly monitor these kind of portals and forward the relevant information (e.g. a challenge brief) to the various departments inside their organization, so that the researchers could find a further opportunity or suggestion for future research endeavors or a potential outlet for the already obtained and insufficiently utilized results.²⁷ Finally, solutions such as those just described (which makes abundantly use of the potential of the web and its outreach) would also provide a concrete answer to some of the questions raised in the previous position paper presented within the T2C project titled "Il sistema della ricerca biomedica transfrontaliera italo-slovena: un elemento strategico di specializzazione intelligente per la politica di coesione 2014-2020"²⁸ by addressing the following questions:


- **how can we overcome the lack of communication of research results? How should they be communicated?**

This, for those who work in the field, is one of the worst problems affecting most of the research institutions and universities around the world. Nowadays, the communication of information is performed through the most utilized medium in the world, the web, which is an essential element in order to reach the largest audience of stakeholders, globally. Unfortunately, only few universities (especially if compared to the overall number, which is above twenty thousands) and research centers in the world have web pages dedicated to technology transfer that can be easily navigated by users with relevant (e.g. showing what are the potential applications of the technology in question), and updated information and this makes the potential match between offers and demands rather difficult. Probably, the easiest solution to make this kind of information easily accessible would be to publish the research results in a very concise and "universal" way (i.e. adopting a standard form), giving also the possibility to information aggregators to operate freely and effectively. Another solution that could be easily implemented to communicate and monetize research results, especially by research institutions, and universities, relates to the possibility of offering non-exclusive licensing opportunities through their websites by using solutions already in the public domain, such as NASA's program called QuickLaunch,²⁹ which generally provides licenses with a set initial fee, annual royalty and standard terms.

27 → At this point it might be natural to try to understand why at the European level portals like those operating in North America do not emerge (at least comparing the outreach), and why there are few European companies who seem to believe in this novel paradigm to boost innovation.

28 → Passamonti, Sabina, *Il sistema della ricerca biomedica transfrontaliera italo-slovena: un elemento strategico di specializzazione intelligente per la politica di coesione 2014-2020*, Position Paper (May 2014), available at the following URL: <http://it.trans2care.eu/UserFiles/file/eventofebbraio2014/position%20paper%20Sabina/Position%20paper%20ver%2010%2005%202014-Passamonti%20.pdf>

29 → For more information about QuickLaunch, please consult the following URL: <https://quicklaunch.ndc.nasa.gov>



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Example on the platform QuickLaunch. Source: NASA

As a matter of fact, a business model with non-exclusive licenses favors a quicker negotiation process, and it should probably be adopted by all research institutions and universities, when possible, to try to monetize some or all of the technologies.

- **How can we innovate innovation in terms of knowledge management?**

To answer this question we must first answer a series of conceptually upstream questions, namely: what is the difference between an idea and an invention?

The definition of “idea” is pretty straightforward. An idea is the most abstract concept that can be conceived while an invention, on the contrary, is usually defined as a technical solution to a technical problem. Finally, an innovation, when it refers to a product or process is not only a new product or process as such, but something more because there is also a social component that characterizes the acceptance of the innovation in question by its users. That said, the innovation process (which is indeed a knowledge management exercise), that brings a new solution to be commonly accepted and therefore become an innovation, could be surely facilitated by tools like those already mentioned with additional features, or through challenge-based marketplaces that could also display the technologies made available by universities and research institutions. The proposal is, therefore, to go beyond what already exists, and is now widely used to combine the idea of an open innovation (challenge-based) marketplace to a database of already existing and available “solutions”. In fact, if we had the possibility to easily know and peruse most of the available technologies beforehand, the choice to seek a solution, maybe through the creation of an open innovation contest, would be made only after having considered all the possibilities which are currently available.

3 CONCLUSIONS

The survey carried out during the Trans2Care project has not achieved the desired outcome in terms of engagement because the number of responses to the questionnaire was insufficient since the selected sample of potential respondents has not been able or willing to participate in the survey. By dovetailing the obtained results with those available from other sources, however, it is still clearly inferable that in the process related to the use, management and monetization of knowledge there is indeed room for improvement, especially if we compare the European experience, in terms of open innovation, with the North American one.

Finally, from the sections of the report devoted to future activities, it is possible to draw a list of action items that could be definitely implemented at the Program Area level (even though a national or international approach would be more suitable), which could accelerate and make the knowledge management, transfer, and monetization processes more efficient and profitable through:

- the creation of ad hoc portals for corporate-sponsored (i.e. managed by a single company) open innovation;
- the creation open innovation portals managed by government agencies;
- the creation of open innovation portals in which public and private interests coexist;
- the creation of portals where open innovation models (especially challenge-based ones) are dovetailed with databases that contain existing available technologies;
- the promotion of available technologies through online non-exclusive licensing schemes with a set initial fee, annual royalty and standard terms.

ANNEX 1

QUESTIONNAIRE FOR RESEARCH CENTERS, UNIVERSITIES AND COMPANIES³⁰

Introduction

This questionnaire has been prepared for the project Trans2Care ("T2C"). Trans2Care's mission is to promote the dissemination of knowledge and technology transfer, encouraging the development of practical and innovative products for the prevention of diseases, early detection, personalized therapies and monitoring of environmental safety and food chain. T2C is a project aimed at creating an international network operating in different fields of science and research aimed at developing new products and services for the improvement of the health system. The project, started in April 2011, is divided into various activities called Work Packages and involves 13 partners located in Slovenia, Friuli Venezia Giulia, Veneto and Emilia Romagna, and it is coordinated by the University of Trieste. The network is also aimed to develop in close contact with industry and institutions belonging to the health system as end-users of new knowledge and technologies. Academic institutions, hospitals and healthcare institutions, research institutes and technology transfer centers that form the network are working together. The aim is to build together an unprecedented model of integration and create a virtuous synergy not only in science and technology, but also from a social and economic standpoint. In this perspective, the project participants have undertaken to achieve a set of common objectives by September 2014.

This questionnaire consists of 4 pages.

Why is it important to participate in this mapping exercise operated by T2C by filling out the questionnaire?

The importance related to this questionnaire, that aims to understand what are the resources in terms of knowledge and activities in terms of actions aimed at enhancing knowledge and its monetization, is a clear reflection of the importance given to knowledge and its management by the new Framework Programme European Commission, Horizon2020, which will be operating for seven years in the range 2014-2020. It is important that those who work in various capacities in the field of research, basic and industrial in the healthcare field, might be able to fully exploit the resources generated because they could make them available to the public and other actors in same or adjacent areas of science and/or technology.

³⁰ → Please note that Section 6, concerning the information of the specific institution, has been expunged from the annex.

Minimum time for completing the questionnaire: 5 minutes

How to fill out the form: please fill out the following questionnaire, **avoiding to mention confidential information**, and forward it in electronic format to:

Luca Escoffier
IP Specialist, Project Trans2Care

Definitions: In the following tables, the term “entity” is used to describe government agencies, research centers, private organizations, and so on.

SECTION 1: protection and monetization of research output

Q.1 In the following table you will be asked what are the activities being performed to favor research results and know-how within your organization.

Question	Answer
To keep track of potential inventions, do you use invention disclosure forms? If not, why?	
Number of filed applications (total)	
Number of filed applications in the last year	
How many applications are PCT ones or foreign?	
Number of granted patents (total)	
How many patents have been assigned/licensed?	
What are the revenues deriving from assignments/licenses?	
How many consulting contracts have been signed in the last year?	

SECTION 2: activities to enhance the produced knowledge

Q.2 In the following table there are some activities intended to enhance the produced knowledge.

Question	Answer
Does your organization have a policy to protect the generated intellectual property? If so, in which form?	
When your organization is contracted to provide consulting services, how is the intellectual property generated during the project regulated?	
Do you have intellectual property specialists working for you?	
Do you think intellectual property be relevant within your organization? Do you have an internal policy regulating it?	

SECTION 3: measuring the scientific/technology output

Q.3 In the following table there are several questions related to the measurement of the output within your organization.

Question	Answer
Number of publications (ca.) in peer-reviewed journals generated by the staff of your organization in the last 3 years (2010-12)	
Number of research projects financed in which your organization has been a project leader in the last 3 years (2010-12)	
Number of new products being commercialized in the last 3 years by your organization (2010-12)	
Number of disruptive or incremental innovations introduced by your organization in the last 3 years (2010-12)	

SECTION 4: awareness of external projects in the field of valorization and monetization of knowledge

Q.1 In the following table some of the major international projects in the field of valorization and monetization of knowledge are being listed.

Question	Answer
Do you know any of the projects intended to valorize and/or monetize knowledge at the national and/or international level?	
Do you know the IBridge Network?	
Do you know the project called EasyAccessIP?	
Do you know free public platforms for patent intelligence and research like Collective IP?	

SECTION 5: future projects intended to favor the valorization and monetization of knowledge

Q.5 The following table concerns present or future projects in which your organization might be interested to take part to.

Question	Answer
Have you ever tried to be part of consortia or platforms in order to monetize or make your patent portfolio publicly known? If not, are you planning to do it?	
If you had the chance to have a Slovenian platform intended to valorize research results and allow an easier monetization of research results, would you join it?	
If the platform mentioned in the previous question would be operating, what are the fundamental services you would like to have?	
Do you think your organization might be interested in a platform like the one described above and would be willing to pay in order to join it? If so, how much do you think it should charge?	
Do you think that a platform like the one mentioned above would be interesting for the researchers working within your organization? If not, why?	