Bridge of Knowledge as the Internet platform for R2R and R2B cooperation

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1. Summary

Research-to-research (R2R) and research-to-business (R2B) cooperation is analysed. The paper shows how IT technology can be used to support and stimulate it. The Internet platform to support such activities is proposed. The platform architecture and its functionality is described. Moreover, some use cases are considered to show its usability and suitability.

2. R2R COLLABORATION AND R2B COOPERATION

Currently the European Commission puts emphasis on supporting collaboration between universities and business. There are many possible ways to create strong relationship between these both parts. Positive results of such cooperation lead to increased competitiveness of the global market and, in consequence, they cause significant growth of innovation.

In our university we proposed the two-step strategy. Firstly, we tried to improve collaboration among scientists in order to develop R2R activities. Secondly, we focused on R2B projects that stimulate the promising scientists to take part in various innovative activities carried out in cooperation with the industry representatives.

Based on well-known good practices, to support such a strategy, the special Internet platform was designed and implemented. Its name is "Bridge of Knowledge", which means that cooperation processes can be developed continuously, step by step, establishing next stages and result in creating new possibilities.

3. BRIDGE OF KNOWLEDGE PLATFORM ARCHITECTURE AND FUNCTIONALITY

In 2016 the Gdańsk University of Technology started the project called "Multidisciplinary Open System Transferring Knowledge – Bridge of Knowledge". The project has been co-financed by the European Regional Development Fund within the Operational Programme Digital Poland for the years 2014 – 2020.

The main goal of the "Bridge of Knowledge" project is the implementation of a platform that integrates data from many databases of the Gdańsk University of Technology, as well as many other universities and research centres. The gathered data and knowledge are easily accessible in public, consistent, and ready for reuse. The resources are accessible to business, the research community and society, in an open, clear and simple form. As a result, there has been created a specific bridge that connects academic communities among each other and with their economic environment (business, non-profit organisations and citizens).

In accordance with the trend in software development of producing microservices, the Bridge of Knowledge platform is an e-service system with RESTful services. They are accessible by modern web interface as well as open API. The whole platform is deployed on the private cloud developed at the Gdańsk University of Technology. The interface of the portal adapts automatically to different types

of devices being used and is designed with care of disabled people. The key functionality of the system is data searching. Therefore, there are various services supported by Elastic Search engine. Of course, there are also closely related services responsible for data processing, storage and indexing. The platform characterizes by high interoperability. The main areas of the integration are the supplementing databases and social media. The platform also supports services that maintain appropriate concept mapping as well as multidisciplinary data matching. In this way, the platform is the tool and space for establishing the R2R and R2B cooperation. Moreover, the acquired experience provides some additional knowledge for improving the intelligence of the platform and its services (see Figure 1).
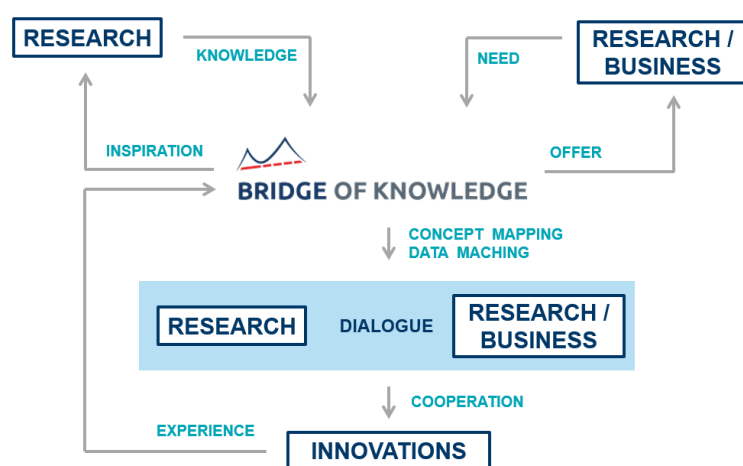

Figure 1. The interaction of R&R and R&B worlds on the Bridge of Knowledge platform

The system has a built-in intelligence, so that it suggests the content on the basis of the search history. There are some search context processing mechanisms that work on context acquisition and analysis. The aim is to offer selected data, which is really expected by the user. The system automatically detects groups of users and adapts the search results accordingly. In this way, the platform becomes an intelligent consultant.

4. USE CASES

The "Bridge of Knowledge" platform has been available online for nearly 2 years and has been attracting more and more new visitors and returning users. With the use of advanced analytic tools and on the basis of the organisation resources a few use cases of R2R and R2B cooperation were analysed and described.

5. CONCLUSIONS

Support and stimulation of R2R and R2B cooperation with the use of IT technology is possible and effective. The proposed solutions are flexible and can be implemented according to the current progress in understanding of such cooperation processes. During the implementation of the "Bridge of Knowledge" platform many aspects have to be taken into account and consideration. There are many standards to follow. Designing such a valuable source of information there should also be put special emphasis on ensuring security and dependability of the platform.

6. REFERENCES

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7. AUTHORS' BIOGRAPHIES

Henryk Krawczyk is a professor of computer science at the Gdańsk University of Technology and serves as the director of the Centre of Informatics - Tricity Academic Supercomputer & networK. He was the dean of the Faculty of Electronics, Telecommunications and Informatics and then the rector of the Gdańsk University of Technology. His main research interests include distributed computer systems and software engineering. He is a member of the IEEE and a member of the Polish Academy of Sciences. He is also a designer of many Internet systems including QESA (Quality Evaluation of Software Application), KASKADA (a system for multimedia stream processing) and the Centre of excellence NIWA (for High Performance Computing). His profile on the "Bridge of Knowledge" platform is available at: https://mostwiedzy.pl/en/henryk.krawczyk

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