Adaption of Open Science Paradigm at Gdańsk University of Technology

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Abstract

The paper describes the basic principles standing behind Open Access and will try to dispel the doubts behind them. Further the solution adapted by the Gdańsk University of Technology is presented. Later on the systems that the University uses and means of their integration into a complex Open Science platform are described. Finally the procedures needed to publish a document in the repository alongside the University's policy are shown and some conclusions are given.

Keywords

Place your keywords here.

Introduction

Open Access plays important role in sharing the research results. The movement is very strong and many Universities are adapting this approach. Some, including Gdańsk University of Technology, tries to go further by encompassing not only the Open Access term (by providing access to publications), but also Open Science, by showing a general openness in project realization, contacts with other research institutions or finally cooperating with business.

It must be noted that Open Access movement is a foundation for Open Science. It is however poorly understood by the scientific community. Usually it is misunderstood as something that forces researchers to give away for free all results of their work. It is also sometimes portrayed as a limitation to the possibility of publishing in renowned journals, as they usually require signing of copyright transfer form, and vice versa – some researchers claim they cannot participate in Open Science as the hold no rights to their papers as they needed to transfer the rights to the publishers.

With the C2NIWA project (Center of Competence Novel Infrastructure for Workable Applications, http://niwa.gda.pl) Gdańsk University of Technology began embracing the Open Science paradigm. The aim of the C2NIWA project is to provide comprehensive services in the area of modern platforms for creating applications (parallel, distributed, and mobile) (Boiński, 2015). The Center offers its users an advanced IT infrastructure, platforms for application development and wide consulting services. Open Science is a key element of the projects infrastructure. As the result the C2NIWA project provides all the necessary tools and systems allowing implementation of the Open Science paradigm. This allows implementation of the required procedures and policies as a standard in Gdańsk University of Technology.

In the following chapters of this paper the basic principles standing behind Open Access are presented. Next an Open Science platform implemented during the C2NIWA project is presented. Later the solution adapted by the Gdańsk University of Technology is described. Finally the procedures needed to publish a document in the repository alongside the University's policy are shown followed by some conclusions.

The principles behind Open Science

In general by Open Access, as defined by three public declarations: Budapest Open Access Initiative (http://www.budapestopenaccessinitiative.org/read), Bethesda Statement of Open Access Publishing (http://dash.harvard.edu/handle/1/4725199) and Berlin Declaration on Open Access (http://openaccess.mpg.de/Berlin-Declaration), is understood as wide, easy, public and free access to scientific publications. Furthermore everybody is allowed to copy, use, redistribute, perform, modify and to create of derivative works (Hofmokl, 2009).

The Green Way and The Golden Way

Open Access introduces two models of material sharing: the golden way, where Open Access is realised by the publisher independently from the business model, and green way, where Open Access is realized using repositories (Rybiński, 2014)(Rychlik, 2007) and the author publishes his or her papers to an open repository independently from the publisher (sometimes even despite the publisher does not do that).

Both of these solutions complement each other. If an author does not have the possibility of publishing in one way they there always exists the other way. It is worth noting that many publishers that do not provide the golden allow publishing using the green way of at least a preprint form of the accepted paper. The policy regarding the green way for the most important publishers can be checked using http://www.sherpa.ac.uk/romeo/ system.

What should be published?

At the beginning the term Open Access was formed mainly for scientific papers but it quickly grew and now encompasses all forms of published materials. Due to that expansion many solutions, including the one implemented at GUT, extends the set of published materials (Suber, 2012). The most common extension is publication of test data and source of software that was developed during the research, as openness of such works can increase trust in the results and allow easy verification and comparison of different approaches.

Bottom-up or top-down?

Open Access is generally a bottom-up initiative. In most of the western countries, where the culture of knowledge exchange is long established the move towards Open Access model was usually sparked by activities of the downstream employees. The scientific society understands that it is in their best interest to increase the availability, and thus citation levels, of their work. In eastern countries however openness is often not considered at all. The thing that matters is how prestigious the journal or conference is and how many points it is worth. The citation level was usually a secondary factor, based mainly on the prestige of the journal. Many researchers still believe that committing to Open Access limits their potential financial income as they will “give away their work for free”.

Bureaucratic strain also plays a major role in limiting the adaptation of Open Access. Due to the amount of paperwork needed to fill on daily basic researchers often do not think about openness. Even if they would like to publish papers using Open Access they usually don't want to spend more time looking for repositories or browsing policies of the publishers.

Controversially creation of yet another bureaucratic enforcement seems to boost implementation of Open Access better than encouragement policies. It is clearly showed by EUA's report (EUA,

2015). Due this reasons both local and European legislation tries to impose Open Access for at least parts of research results that are conducted using public funds.

Open Science at GUT at Gdańsk University of Technology

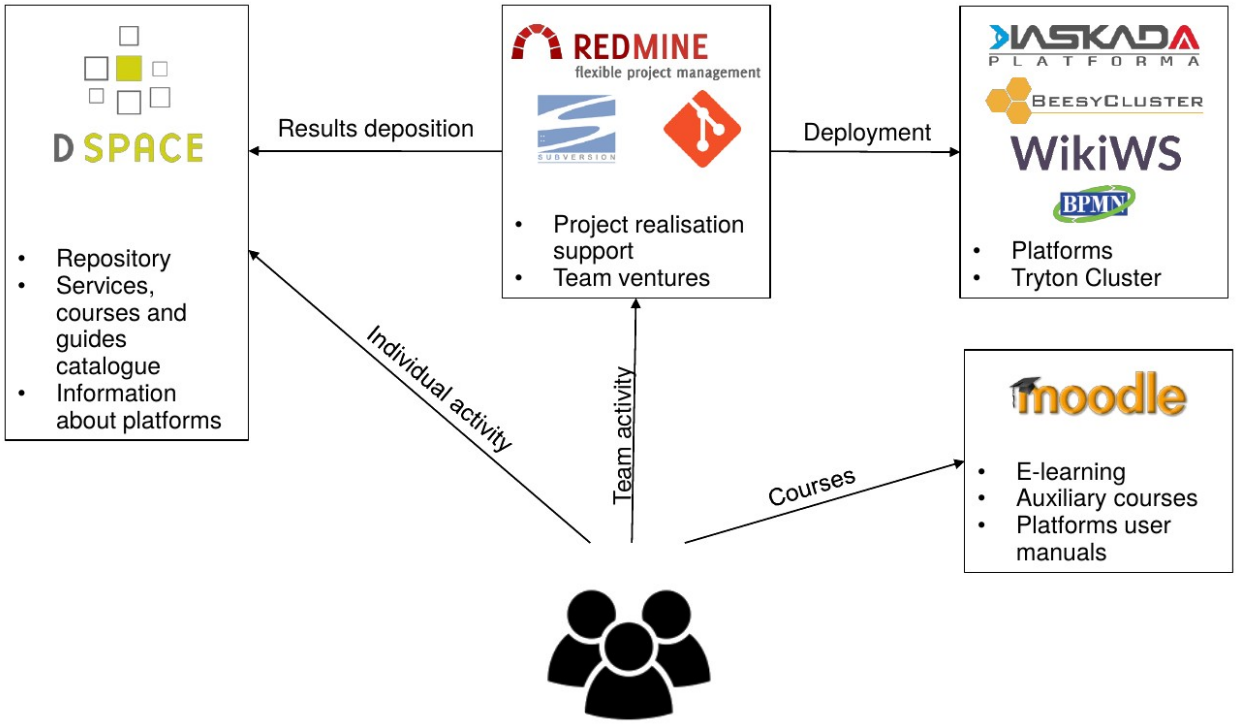
Gdańsk University of Technology started preliminary work on implementing Open Access policy few years ago. With the funding from the C2NIWA project it became possible to finally implement the Open Access paradigm. This process consists of multiple steps:

- development and implementation of C2NIWA Repository;
- definition of GUT Open Access Policy;
- legislation work regarding the Open Access Policy;
- implementation of software changes require to actually implement the Policy;
- propagation of the changes to the community.

C2NIWA Repositories

With the C2NIWA project the Gdańsk University of Technology wanted to go beyond Open Access and implement an Open Science platform, where institutional repository is only a small part of the whole platform (Fig. 1).

Figure 1. C2NIWA Open Science Repositories



The C2NIWA Open Science platform composes of four main components:

- The institutional repository that is built on top of widely used DSpace system (http://www.dspace.org/) adapted to the needs of the Center. The main task of the repository is the storage and distribution of scientific papers, but it also works as a catalog of available platform, courses, services, tutorials and solutions offered by the Center.

- Project support system based on Redmine (http://www.redmine.org/) and GIT (https://git-scm.com/) or SVN (https://subversion.apache.org/) repositories. It allows cooperative project realization and code integration. It also serves as a repository of projects done by the Center and its users.
- E-learning platform based on Moodle used to publish courses strengthening soft skills of team members and teaching how to use rest of the systems in Open Science. All the courses are free.
- Platforms (KASKADA (Krawczyk, Proficz 2012), WikiWS (Krawczyk, Downar, 2012), BeesyCluster (Czarnul, 2013), BPM) that support development and execution of software and services, they give access to resources of C2NIWA, mainly the Tryton Cluster (http://task.gda.pl/kdm/sprzet/tryton/). The WikiWS platform plays a special role in the Open Science as it is freely available and can be used for easy deployment of WebServices based solutions.

All those systems form a complete repository of activities occurring at C2NIWA and thus allow easy communication and results sharing between research teams. The knowledge gained during realization of C2NIWA Platform allowed us to start development of the University repository itself.

Open Access Policy and legislation

The most important thing regarding implementation of Open Access is the University's policy. The Polish law in general does not give any rights to the papers to the University, thus we are bound with the limitations of the fact, that most rights to the papers belong either to the authors or to the publishers.

The main points of the policy are:

- Gdańsk University of Technology adapts the policy based on the green way with encouragement to publish using the golden way
- The papers should be published by the original authors – as such self-archiving will take place.
- The repository will be governed by the Main Library.
- The policy will be semi-mandatory for scientific publications, chapters in monographs and complete monographs. For different type of publications the encouragement policy will be applied.
- The repository should contain every scientific paper published by faculty members independently form it's openness.
- By default the submitted work will be made public immediately. Usage of embargo needs to be justified by the author.
- Whenever possible the final, reviewed versions should be published.
- Exclusion from the policy requires a consent made in writing.

A few aspects of the policy requires some clarification. First of all the Repository will be located at the Main Library to tap into benefits of the library regarding redistribution of copyrighted materials. Second, by applying the self-archiving paradigm we can utilize the publishers consent to use the green way making the repository default place for storing scientific papers for our employees. The most important thing however is the requirement of deposition. Originally we

planned on making the policy mandatory, however it occurred that the copyright law does not allow us to do that. We decided that we will strongly encourage the scientific community to take part in Open Access by promoting the movement and making it the default action when registering a paper in the University's systems. The author will be able to opt-out from the policy but will have to somehow justify the decision. In the future we will try to include the policy into the employment contract so that at least new employers will be bound by the policy. The current solution provides no legal means to counter the author's decision.

The policy itself also defines the licenses that the author should give to the users. In our solutions we decided that the author will give the University the right to reproduce and redistribute the paper in form of non-exclusive license. The users of the papers will not get the license to the paper form the University but from the author himself so that the legal responsibility by obeying the license will remain with the author not the University.

Changes to university procedures and systems

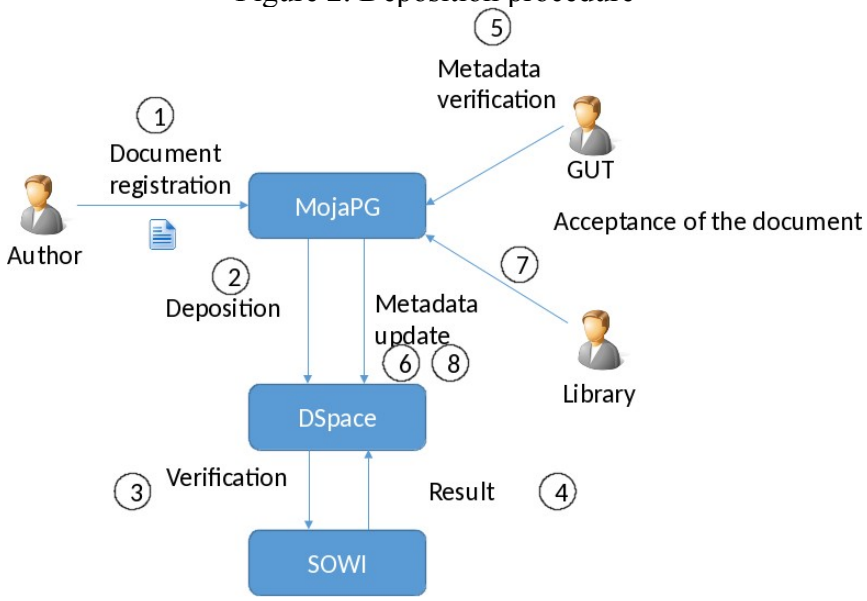
Currently different type of works are handled differently. The scientific papers are registered by the authors in the University system. Only bibliographic description is somehow verified mostly for the needs of reporting. Engineering and master theses are verified using our own anti plagiarism system (SowiDocs) and stored in the internal repository in form of full text. PhD theses are mainly stored as hard copies in the Main Library, but some of them are stored, with author permission, in the electronic library based on DLibra software. With the changes required by implementation of the Open Access Policy we would like to unify the deposition process for all forms of the documents.

General procedure is shown in Fig. 2. The whole process goes as follows:

1. The author registers his or her work in our systems (MojaPG).
2. Metadata required for reporting is stored in MojaPG system and the full text version, alongside all metadata are stored in internal DSpace repository.
3. The document is sent to verification but our anti-plagiarism system.
4. The verification results are stored in the DSpace repository.
5. In parallel to step 3 appropriate employee of the Gdańsk University of Technology verifies the metadata of the document. Different employees will be designated to publications, PhD theses, master and engineering theses etc.
6. The result of metadata verification is propagated to DSpace repository.
7. Main Library employee verifies the attached file and the license that the author defined, mainly in terms of accordance with publishers policy regarding Open Access.
8. After verification the employee of the Main Library finally approves the document in DSpace repository.

We plan on storing all documents created by scientific community related to the Gdańsk University of Technology in internal, inaccessible repository. The Open Access paradigm will be realized by dedicated, public instance of the Repository, where all documents, where authors did not opt-out, will be transferred using AOI protocol. It will be a dedicated, separate instance of a DSpace repository available in read only mode to the whole world.

Figure 2. Deposition procedure



The key thing to remember here is that added bureaucratic burden would hinder the whole process. Currently during their employment researchers at GUT are required to register every publication written during the research process. Full text version of the document is not required. Engineering and master level students are required to upload full text version of their thesis, the metadata are filled by appropriate employer. To limit the bureaucratic strain put on our employees we utilize as much of the current process as possible. The researchers will have to upload the full version of the paper during well known and accepted registration process and the PhD students will have to follow the same path as the rest of the students. The employees currently verifying and accepting metadata of documents will continue to do so using the same tools. The implementation of the Open Access will require however changes in the Main Library, where all new tasks will be located. This however should limit impact of applying the policy on the University as a whole.

Alongside the implementation of the Open Access paradigm we plan on strengthening the protection of copyrights of our employees and students. Currently only engineering, PhD and master theses are verified and not all publications can take part in the verification process. By storing all GUT works in the internal repository we will gain access to bigger database of the documents further improving efficiency of SowiDocs system. The possibility of connecting DSpace with the SowiDocs system will be also available as standalone plug-in allowing other universities using DSpace to connect with our anti plagiarism system.

Recommended licenses

While depositing a paper the author will have three choices depending on the type of his or her work and the decision made. Gdańsk University of Technology adapts libre approach in it's policy thus a recommended action would be to apply a Creative Commons or one of the Open Source licenses. The author should choose appropriate variant during the deposition process. The task of the University will be to ensure it's compliance with the policies of the original publishers of deposited work.

- To not apply any license – not recommended, in this case the work will be available based on the copyright law stating that the users of the repository will be able to read the paper or run the software but nothing more. There will be no permission to redistribute the work or create any derivative works.
- To apply one of the Creative Commons license – recommended for any type of creation except software. It should be applied whenever possible and this automatically allows redistribution and usage of the work for creation of derivative works. By using the wizard built into the DSpace software the user can limit the rights of the repository users to some extent. It is recommended to provide at least permission to use the work for non-commercial purposes and allow creation of derivative works with requirement to distribute them under the same condition as the original license of the item. The license however should comply with rules of the original publisher. Gdańsk University of Technology advises application of at least Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International license.
- To apply one of the Free/Libre Open Source Licenses (FLOSS) – recommended for assignment license to the software. The user can choose between 2- and 3-clause BSD, MIT/X11, GPL and LGPL version 2 and 3. The type of the license should be chosen dependent on the amount of rights that the authors would like to give the users. The proposed algorithm of license assignment is in Fig. 3.

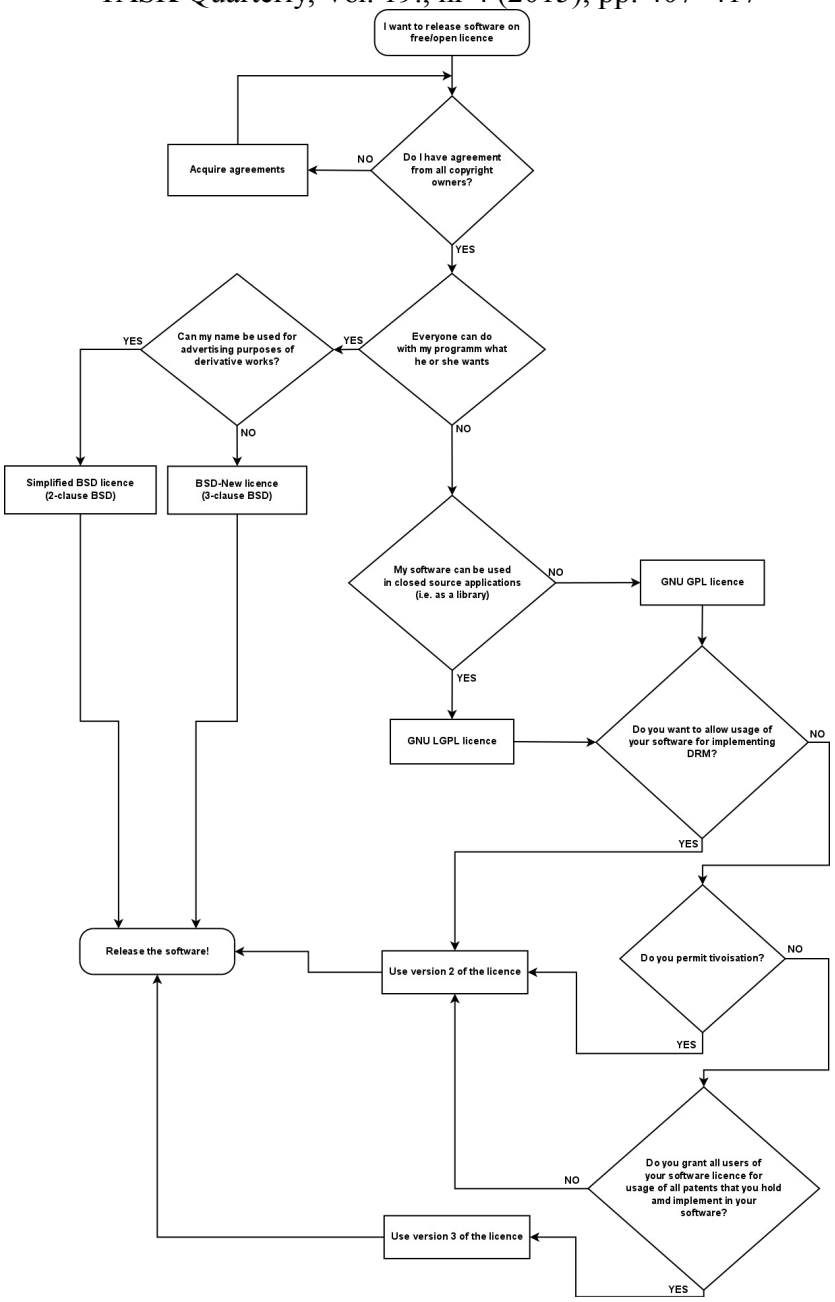
Conclusions

Open Access plays more and more important role in today's research process and is a key to a wider concept of Open Science. With growing costs of accessing publications alternative means of reaching for knowledge becomes necessary. Modern technology, especially the Internet, gives us the opportunity to access the information and data in an easy fashion.

Traditional access to scientific papers was guarded with many barriers. The most important one is limiting access to articles by access fees. Fortunately with Open Access movement this barrier is lowered and results of scientific research is available how it was never before. With the C2NIWA project the Gdańsk University of Technology have the tools and experience needed to properly implement procedures required to adapt the Open Access paradigm.

Our experience shows that implementation of openness in any kind brings some problems and misunderstandings. When the University decided that all lecture materials should be available for students our faculty members feared that it will lower the number of people showing in classes. With Open Access they fear of loosing the results of their work or ability commercially implement their work. We however strongly believe that our implementation, alongside proper training and proper promotion of the aims of the policy and the policy itself will allow successful transition towards Open Access model and thus strengthening innovation and general level of science among our scientific community. Furthermore with growing understanding of the open model we believe that with due time the University will be fully able to switch towards the Open Science model.

Figure 3: Proposed algorithm for software license selection
Source: Boiński T., Adaption of Open Science Paradigm at Gdansk University of Technology, TASK Quarterly, Vol. 19., nr 4 (2015), pp. 407–417



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