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## E-Infrastructure for Technology Assessment

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**Abstract:** *Nentwich gives an in-depth account of developments within the TA community towards a common e-infrastructure for technology assessment (TA). The author argues that while technology development is genuinely international, there are too few endeavours to address technology assessment (TA) issues internationally; likewise, there are no sustainable online platforms for knowledge sharing, dissemination and public debate as yet. The PACITA project partners therefore worked to establish such an infrastructure by means which the article details. Creating and sustaining a strong, interactive e-infrastructure for cross-European TA is both greatly challenging and worthwhile as it would ultimately help to nuance and possibly even democratize European science, technology and innovation policy. Nentwich therefore argues for the continuation of these efforts by central actors in and supporters of TA.*

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*While technology development is genuinely international, there are only few endeavours to address technology assessment (TA) issues internationally; likewise, there are no sustainable online platforms for knowledge sharing, dissemination and public debate as yet. Creating and sustaining a strong, interactive e-infrastructure for cross-European TA is both greatly challenging and worthwhile as it would ultimately help to nuance and possibly even democratize European science, technology and innovation policy.*

Recently, the international TA community started facing this challenge and increasingly produces digital infrastructures for daily work and communication as well as for outreach. This chapter presents elements of current e-infrastructures and practices. A particular focus is on the new TA Portal launched by the PACITA consortium in 2012. This portal has the potential to become a one-stop service and exchange platform for both TA practitioners and those interested in technology policy and TA in general. However, in order to reach and sustain its full potential, this core e-infrastructure for TA needs to become more than a database with interesting and potentially useful content. The article argues that the portal should turn into a dynamic and interactive platform.

We distinguish the following main elements of TA e-infrastructures as they exist today: the EPTA website and project database; videoconferencing tools as used in international projects; outreach activities of TA on social network sites such as Facebook and others; a few TA-related tools and databases; the Network for Technology Assessment's web portal openTA; and the PACITA TA Portal. The core of the latter is a database that covers TA publications, projects, experts, and organizations. Furthermore, the Portal recommends selected TA-related Internet resources and offers a list of the latest TA news on the homepage. The TA Portal is a work in progress; plans to enhance its functionality, described in the following, are being implemented.

By devising the TA Portal, by coordinating the joint international effort to filling the database, and by reflecting the usability and usefulness for future activities, we learned that it is both an enormous challenge in technical, conceptual, and organizational terms, and it is a promising opportunity. While putting in place a schema and (semi-)automatic procedure to fill a database with useful information was (and is) a big effort, it still is only half the story. Turning the Portal into a lively platform that serves

the TA community and that connects it to its addresses and interested actors across Europe demands a far greater effort. Such a platform would be not only a technical tool but also a social enterprise. In order to activate its content, editing staff is needed with a mandate not only to disseminate results but also to advocate the balanced results reached by TA methods for incorporation into the European debate.

Reaching the full potential of the TA e-infrastructure in the making and scaling it up needs:

- ▶ An electronic infrastructure for TA practitioners that can also serve as a platform for debate and policy support demands financial resources and time to incorporate lessons learned on a continuous basis.
- ▶ A permanent cross-European TA network with a sustainable budget to support editorial or facilitating functions.

## Introduction

Technology development and diffusion has no borders, nor have impacts, chances, and risks of new technologies. Despite this obvious fact, there are only a few endeavours to address technology assessment issues at the international level (in particular in a series of common EU projects,<sup>1</sup> such as PACITA), but most TA takes place in the national arena. The main reason for this is that technology governance, so far, is to a large extent national; furthermore, assessment is culturally bound and also dependent on local circumstances. Nonetheless, TA practice is increasingly international in the sense that it relies on a network that provides for the exchange of methods and personnel, as well as for mutual stimulation and enrichment when it comes to watching and assessing technology trends. The backbone of this network consists of regular conferences (EPTA, PACITA, NTA, and ITA series), journals, and two associations (EPTA and NTA). In line with, but following with some delay, the global trend towards cyber-science (Nentwich, 2003) and open science (e.g. Bartling and Friesike, 2013), the international TA community increasingly uses digital infrastructures for daily work and communication.

The earliest elements of this evolving e-infrastructure for technology assessment date from the late 1980s and 1990s (cf. Nentwich and Riehm, 2012; Nentwich, 2010). Most prominently, the German ‘TA-Databank’,

operated by the ITAS in Karlsruhe from 1987 to 1998 (Berg and Bücken-Gärtner, 1988), was an encompassing online database (still available on CD-ROM). By 1999 it contained datasets of over 570 institutions, approximately 3.400 projects and 7.000 publications.<sup>2</sup> From 1997 to 2013 the ITA in Vienna took care of the virtual library ‘TA in the WWW’, containing some 270 links.<sup>3</sup> A first attempt to establish a social network for TA practitioners on the basis of the Ning platform in 2008 by the NBT in Oslo attracted only a small proportion of the community (approximately 75 members in 2010; cf. Nentwich, 2010) and never showed much activity (it has been offline since 2013). Furthermore, the German TA network experimented from 2006 to 2012 on its previous website with a meta-search engine (on the basis of Google Custom Search) covering the content of the NTA member organizations’ websites. In addition, some EU-funded projects resulted in web platforms offering specific TA- and foresight-related tools and databases (listed in the section below). In the meantime, in particular in the framework of the PACITA project and the NTA network, new developments are under way.

The remainder of this chapter gives an overview of how digital means, mainly via the Internet, are used and needed both inside the TA community and vis-à-vis its addressees in politics and in society today. In the next section, the elements of this infrastructure are briefly described, followed by a longer section on the international TA Portal designed and implemented by the PACITA project team and by a concluding section with an outlook on the development of the e-infrastructure for TA. We argue that an increased online presence of the cross-European TA community would benefit European policy making.

## The main elements of the current TA e-infrastructure

From around 2010, actors in the TA community have started new initiatives to build up a modern digital infrastructure. The main fora of these activities are the German TA network (NTA),<sup>4</sup> the European Parliamentary TA network (EPTA),<sup>5</sup> and the EU-funded project Parliaments and Citizens in TA (PACITA).<sup>6</sup> In 2014 the e-infrastructure of the TA community included the following elements:

*EPTA website and project database:* For more than ten years the website of EPTA features an online project database, now containing almost 900 datasets with titles, keywords, project life spans, contact persons,

descriptions, and links to further information.<sup>7</sup> The content of the database is provided by the member institutions by more or less regularly filling an online form; the site and database is currently operated by the DBT in Copenhagen – in the future by ITA in Vienna, after a re-launch scheduled for 2015.

*Videoconferencing:* TA projects are often carried out by dispersed teams with staff from several organizations across Europe. Although TA practitioners also use face-to-face meetings, they have followed the general trend of international professionals by increasingly using videoconferencing tools, such as WebEx (e.g. in PACITA) and most frequently Skype, to meet. While these meetings are considered indispensable for specific purposes or occasions and best practices have evolved over time, experiences with network stability and technical quality of the services are still mixed.

*TA on social network sites:* As TA has an important interface with the general public alongside the political and the academic spheres, all TA organizations have public websites that communicate their identities and work. Many but not all TA organizations are now also present on the main social network sites, such as Facebook and Twitter. Many also contribute to TA-related topics on Wikipedia (Nentwich, 2010). For most organizations, however, this work takes place with limited success and resources. EPTA and NTA as well as some TA projects like PACITA are also operating Facebook pages. Except for some individuals, Twitter is still used only sparingly by TA organizations or practitioners (cf. König, 2015).

*TA-related tools:* A few EU-funded projects resulted in databases of platforms serving specific purposes of the TA community. One such example is Doing Foresight,<sup>8</sup> a support instrument for activities/projects on future-oriented policy analysis. Another is the Decision support on security investment (DESSI) Tool,<sup>9</sup> giving insight into the pros and cons of specific security investments. A third is the European Foresight Platform (EFP), providing briefs of foresight processes carried out in Europe.<sup>10</sup> The main problem with these tools and databases is, that after the end of project-related funding, they tend to be forgotten and not updated anymore. Furthermore, the international publications' repository, in particular the one for economic research papers (RePEc), provide the opportunity to organize TA resources on the Internet (cf. Moniz, 2015).<sup>11</sup>

*NTA Fachportal openTA:* In the framework of NTA, funded by the German research fund DFG and carried out by ITAS and

ITAS' partners, the openTA portal is the latest newcomer of the e-infrastructure of TA, which launched in 2014.<sup>12</sup> The main elements of openTA currently are: an NTA members' (individual and organizational) database; a news aggregator, fed by the NTA member organizations; a common calendar of TA-related events (conferences, calls, teaching, lectures, etc.), also fuelled by NTA members; a TA blog; and an encompassing TA publication database that covers publications not only of the member organizations but well beyond the TA community, which is also fuelled by the German national library and other databases. The openTA portal is not intended to be a technology-oriented database project, but rather an 'innovation project for the TA community' (Nentwich and Riehm, 2012, Riehm and Nentwich, 2014).

*PACITA TA Portal:* Since 2011 one of the tasks of the EU-funded project PACITA was the establishment of a comprehensive portal for TA-related information in Europe and beyond. The task leader was ITA in Vienna. On 22 October 2012, the first version of the new service had been launched at the EPTA Council meeting in Barcelona.<sup>13</sup> The portal cooperates with the openTA initiative with a view to avoid duplication and exploit synergies.

## The PACITA TA Portal

The core of this web platform is a database that covers four types of TA-related information: publications, projects, experts, and organizations. The users interact with the database via either simple or more detailed search forms. The results are presented in tabs and as a hypertext, allowing for browsing in the lists of results – for example, by jumping from a publication to its authors or from there to their home organization or to the related project. The users may also directly retrieve a list of the latest updates of the database (recent publications and more). See the following screenshot for an impression of the look and feel of the website.

The datasets are provided in a decentralized way by the participating TA organizations, harvested and stored centrally by the portal. Some of the data providers use automated scripts to transform the content of their local databases into the format prescribed by the portal; others do it manually.

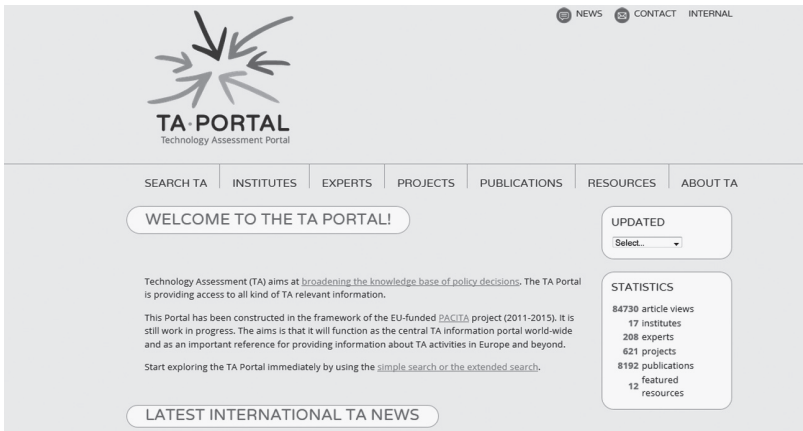


FIGURE 12.1 *Homepage of the TA Portal (screenshot taken on 30 April 2015)*

At the time of writing, the database includes datasets from 17 organizations, over 200 experts, 621 projects, and roughly 8200 publications. While the portal includes data from all PACITA member organizations and two other TA units (the US GAO and the German TAB), it is intended to have global reach, including relevant information from any organization that works in the field of technology assessment. As an obvious next step, further EPTA members (some are already part of the PACITA project and hence of the Portal) shall be included. Furthermore, a (two-way) bridge between the openTA and PACITA portals should be established to include data from further NTA members (some are already part of the PACITA project and hence of the Portal). Aiming to attract more content providers, PACITA has adopted a policy document that sets out in a transparent way the criteria for membership in the Portal. These include a definition of TA and of eligible TA organizations (individual persons cannot directly contribute content to the Portal).<sup>14</sup>

Beyond these core functionalities, the TA Portal has two further features: First, it recommends a few special Internet resources (currently ten, including the PACITA VolTA magazine and PACITA deliverable 2.2 on the comparison of existing PTA organizations). Second, on the homepage, a list of the latest TA news is presented. This is the first outcome of the cooperation between the TA Portal and openTA, as the latter provides a so-called widget to include the aggregated news on any

website. The portal team currently negotiates with both the openTA team and other EPTA members to provide their news as a feed in English that contributes to the openTA news aggregator and consequently to a broader coverage of the TA news feed on the TA Portal.

In the mid-term, the TA Portal should be relaunched in version 2, including a number of additional features: a global TA calendar is on the agenda as well as an improved search engine that will allow one to find, for instance, particular types of publications (e.g. policy briefs) or of publications in specified languages. Furthermore, an interactive TA questions and answers forum could be included to make the site even more attractive. Users should be able to subscribe to an update service, sending emails to them on a regular basis with information about the latest TA publications or projects. Finally, there is a plan to set up (and include in the search) an open access TA repository for TA-related publications that are not included in one of the member organizations' websites. This would enable researchers affiliated with non-TA organizations, but publishing relevant articles, to include them in the TA Portal.

## The way ahead

There is no doubt that broadening the knowledge-base of political decision making is urgent due to the complexity of the grand challenges that our societies face. As argued in the introduction to this volume, TA in its various forms, from providing well-balanced expertise to involving stakeholders and citizens, contributes in effective and well-established ways to future-oriented policy activities. Given the intrinsic cross-border nature of technology development, the need for a strong cross-European foundation of TA is evident. To induce dynamic cooperation, open debate, and knowledge sharing on these highly salient issues the TA community and its addressees will greatly benefit from a state-of-the-art e-infrastructure.

Our brief description of the current digital infrastructure available for technology assessment shows that with the PACITA TA Portal (along with the openTA platform) the TA community is about to reach a next level. The current platform has the potential to become a one-stop service for TA, especially if it is developed further both in terms of the types and quality of services offered and the scope of resources included. The



PACITA TA Portal in particular could serve as the background infrastructure for the EPTA website.

An Internet portal can be regarded as an infrastructure in two ways. First, it is an internal service that is intended to help TA practitioners to do what they have to do: to stay up to date about the TA literature; to know whom to approach for specific expertise; to build on projects done by others; to stay informed about the current activities of fellow TA units; to be aware of TA events; to stay tuned with current trends; and so on. Furthermore, such an infrastructure may potentially offer a communicative space for exchange, be it written (blogs and discussion fora), spoken (videoconferencing), and possibly even social network functions. So far, the current infrastructure focuses on mainly the internal aspect, while there is still a long way to offer an ideal environment for online collaboration.

The second way to look at such a portal is with the eyes of the customers of TA – that is, actors in both the political and the public spheres who are interested in technology policy and assessment. To turn the existent portal into an information platform that presents TA-related information in a format that is attractive to laypersons in general and to decision makers in particular is, however, a much greater challenge. This would mean adding a public relations side to the sober database; it would mean having an editorial team that selects and presenting the latest TA results in a catchy way; and it would mean making the platform interactive and communicative, which possibly includes having a presence on the popular social network sites. All this needs to be thought and structured as a long-term, sustainable enterprise.

Both aims, the internal and the external one, are worthwhile to invest in, be it in terms of ideas, time or, ultimately, financial resources. The latter will have come to an end with the conclusion of the PACITA project in spring 2015, so the future of the TA Portal and hence the backbone of the current international e-infrastructure for TA is in limbo. Keeping the platform alive will be possible for some time on the basis of contributions made in kind by the leading TA organizations. Expanding it, improving it, and turning it into the envisaged one-stop service and communicative platform for TA, however, can be done only with an additional financial effort and a certain element of (cyber-) entrepreneurship. The TA community is called to make its own modern infrastructure a prime concern. And it needs continuous societal support.

## Notes

- 1 See Chapter 5.
- 2 Cf. [http://www.itas.kit.edu/1999\\_008.php](http://www.itas.kit.edu/1999_008.php).
- 3 In 2014 this link collection is still available via the EPTA website at <http://www-97.oeaw.ac.at/cgi-usr/ita1/tawwww.pl?site=epta>.
- 4 <http://www.openta.net/netzwerk-ta>.
- 5 <http://eptanetwork.org>.
- 6 <http://www.pacitaproject.eu>.
- 7 <http://eptanetwork.org/projects.php>.
- 8 <http://www.doingforesight.org>.
- 9 <http://securitydecisions.org/decision-support-tool>.
- 10 <http://www.foresight-platform.eu/briefs-resources>.
- 11 <http://biblio.repec.org/entry/oca.html>.
- 12 <http://www.openta.net>.
- 13 <http://technology-assessment.info>.
- 14 [http://technology-assessment.info/images/TA-Portal-Policy\\_v260313.pdf](http://technology-assessment.info/images/TA-Portal-Policy_v260313.pdf).



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