SCIENCE AND TECHNOLOGY OPTIONS ASSESSMENT NEWSLETTER

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NEW LEARNING AND TEACHING TECHNOLOGY OPTIONS
Outcomes of a workshop and new STOA study

On 8 April 2014 STOA organised a workshop on 'New learning and teaching technology options'. The workshop examined the constantly changing ways in which people learn and options provided by new technologies.

The event was chaired by STOA Vice Chairman Paul Rübig and featured speeches by Professor François Taddéi, Centre de Recherches Interdisciplinaires (CRI), Faculté de Médecine, Université Paris Descartes; Dr Maren Deepwell, Chief Executive of the Association for Learning Technology (ALT), Oxford; Professor Vittorio Loreto, Physics Department, Sapienza University of Rome; Professor Stefan Thurner, Head of Section for Science of Complex Systems, Medical University of Vienna; Ray Pinto, Senior Government Affairs Manager, Microsoft Europe, Middle East and Africa; and Pedro Pinto, CEO, Take the Wind.

All the speakers concurred that major change was needed in conceptions and structures of the education system, which would take into account technological changes and equip learners with the skills they could use in an unpredictable future. Teachers should work as guides and mentors, while students should direct their own learning and foster their creativity in order to solve and redefine problems. Therefore, creativity needs to become a value in education.

How does technology fit in here? Technology should be used to teach the digital skills needed in the employment market. Tools are already being developed to help schools and teachers teach children about computer science. The emphasis should be on quicker implementation of technology which nowadays is not the case.

Furthermore, exploring teaching methods through games and other technological methods can be used to give precise feedback to learners. The data gathered can even be used by technological teaching tools to adapt to an individual learner's needs. However, the question of using big data and analytics from learners using adaptive learning tools also raises questions of privacy. A balance must be reached between learning from the large-scale use of technology and learners having control over their own data.

Given the potential impact of technology on education as suggested during the workshop, STOA will examine the technological options further with a study. This study will consider how technology can best be used to stimulate creativity and collaboration in learning and teaching, from the teaching of digital skills to gaming, adaptive learning, and beyond.

SCIENCE METRICS: Measuring scientific performancefor improved policy-making

From the 'Science Metrics' workshop of March 2013: STOA Chairman António Correia de Campos

From the 'Science Metrics' workshop of March 2013: The STOA Chairman, speakers Erik Arnold and Julia Lane

This study's main objective was to analyse the desirability and feasibility of creating a European transnational system for collecting and monitoring research performance data, in order to improve policy-making and identify relevant policy options. The study analysed the importance of monitoring and measuring research performanc, as well as its efficiency and impact. It also looked into current approaches to the collection of information and research performance assessment data in Europe and the Member States, considering benefits and challenges.

The project ran from June 2012 to March 2014. Interim findings were discussed in a workshop held by STOA on 26 March 2013 and chaired by STOA Chairman António Correia de Campos. That workshop was presented in the January-April 2013 edition of the STOA Newsletter.

The final report identified and analysed the following policy options:

Policy option A: Commitment to an improved methodological framework for research performance assessments

Current trends in research governance generate new demands for the practice of evidence–based evaluation. Policy-making is increasingly required to be 'evidence-based', so evaluation becomes a priority for both policy-makers and research actors. Evaluation has taken on a more pronounced prospective function, in addition to the traditional retrospective one.

The pressures set upon the evaluation practice imply the need for evaluation methodologies to be updated. The greatest challenge in this context is to better understand the dynamics leading to knowledge creation and innovation and the possibilities to assess the economic and societal returns of public investment in research.

Recognising the increased methodological complexity of evaluation in the context of Horizon 2020, the European Commission announced its intention to develop a European Research and Innovation Evaluation Network. The Horizon 2020 evaluation system should explore new methodologies for the evaluation process.

Policy option B: To coordinate the development of national research information systems in the European Member States

The current trend in Europe towards the development of national research information systems needs to be seen in the context of growing pressure to monitor and measure research. The majority of the systems are fully operational. Steering this trend at an early stage is critical to promoting inclusiveness and stimulating the on-going development of national research information systems.

This requires the commitment and involvement of a 'neutral' policy agency at the European level. Useful action in this context would be to share best practice and raise awareness about the benefits of national research information systems for all actors in the research system.

Policy option C: To coordinate the development of a standard approach to the definition of outputs and other indicators

There is a growing need for an integrated European view of research performance and impacts. The correct mapping of terms used in different systems is crucial, as is the selection of common indicators in all national research information systems. A set of workshops and possibly working groups should be launched for this purpose.

Policy option D: To support the technical development of an integrated European research information infrastructure

There is a need for harmonisation and interconnection of information systems. The integrated European research information infrastructure should take the form of a distributed infrastructure, connecting existing national research information systems.

With the present fragmentation of the EU research landscape, this is not achievable solely through bottom-up initiatives. Coordination of the process is critical, involving all EU Member States and relevant stakeholder communities, such as policy analysis experts, national funding agencies, researcher communities, and managers of national research information systems.

RESPONSIBLE GOVERNANCE IN SCIENCE AND TECHNOLOGY
Outcomes of a workshop

Debates on the social implications of science and technology (S&T) developments are at the core of the relationship between science and society and represent a major determinant in the future uptake of specific technologies. The importance of governing S&T responsibly has grown over the past decades in diverse fields like ethics and technology assessment.

This was the major topic for a workshop entitled 'Responsible Governance of Science and Technology: perspectives from Europe, China and India', organised by STOA on 19 March 2014 at the European Parliament in Brussels. At this event, researchers from the three regions presented their views of responsibility in S&T governance.

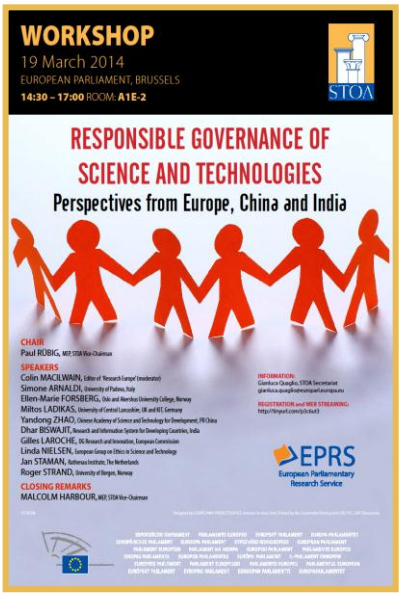
The EU, India and China are at different stages of economic and social development, but all face challenges regarding the relationship between science and society. S&T developments in the three regions are intimately related in terms of both collaboration and competition.

The EU has reached the common understanding that its S&T strategy should encompass both expert and public opinion, utilising wide consultation processes. This has resulted from heightened public perceptions of risks and benefits of S&T developments over the past twenty years. The EU progressively opted to follow a socially and ethically responsible governance approach to S&T, developing the concept of Responsible Research and Innovation (RRI).

The concept of RRI is not explicitly included in Indian and Chinese S&T policy, but comparable ideas about responsible governance have started to develop. Responsible governance has to be adapted to the particular cultural and need-based context. However, the issues that each region is faced with are similar in nature.

The discussion reached conclusions on some of the next steps that could be taken to realise a common responsible governance in S&T:

- Establish a shared deliberation platform on S&T for societal challenges;
- Initiate capacity building programmes for common structures in policy advisory bodies;
- Promote the development of common S&T societal impact indicators;
- Develop comparative systematic public perception databases; and
- Promote shared guidelines for public engagement.



STOA Vice-Chairman Paul Rübig and moderator Colin Macilwain

FINAL REPORT ON INTEGRATED E-TICKETING

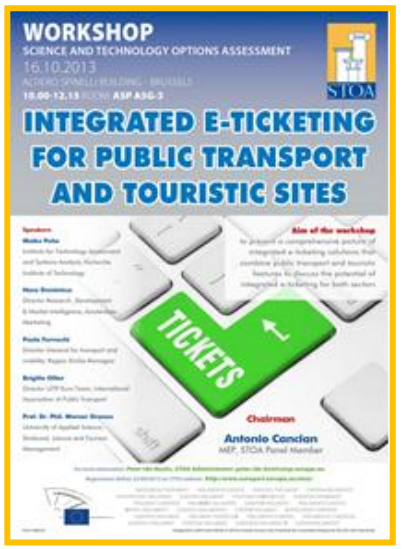
Both the transport and the tourism sector are subject to a transformation that is shaped by information and communication technology (ICT). ICT is believed to be an enabling technology for the formation of a single multi-modal transportation system that does not distinguish between transport modes. The overarching idea of a multimodal transportation ticketing system is to combine all modes on a single ticket. Integrated ticketing schemes aim to facilitate the combination of modes and the transfer between them by making the ticketing system as easy and attractive as possible. There are various e-ticketing media available, of which the most promising are smart cards and mobile ticketing.

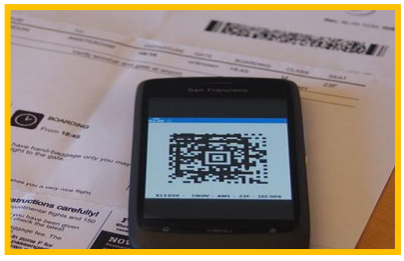
However, while technologies are already available and ready to meet multi-functional requirements, such integrated schemes often do not reach implementation, in spite of positive expectations regarding the positive effects of integrated ticketing on sustainable transport.

Notwithstanding some pilot projects, e-ticketing has not yet been implemented on a wider scale in Europe. The implementation of an integrated e-ticketing system is a complex process. Besides technological aspects, legal and economic aspects play a decisive role. The integrated ticketing environment comprises different actors, who each have a different role to play and for each of whom drivers and restraints apply in the decision to participate or not in the process. The most important operational actors involved can be categorised as follows:

- Public transport operators and authorities,
- Government and other administrative authorities,
- Tourism sector,
- Intermediaries (telecommunications operators and financial service providers), and
- Existing and potential end-users.

The project has produced a number of policy options, in order for the different actors to attempt to overcome the organisational barriers related to the implementation.





EPRS
European Parliamentary Research Service

25 years at the service of European policy making
Science and Technology Options Assessment
STOA

STOA (Science and Technology Options Assesment) is an official body of the European Parliament, whose task is to carry out expert, independent assesments of the impact of new technologies and identify long-term, strategic policy options useful to the Parliament's commmittees in their policy-making role.

STOA Management

STOA's policies and objectives are overseen by the **STOA Bureau**, elected by the **STOA Panel**, which is **composed of 15 MEPs**, including the EP Vice-President responsible for STOA and 14 MEPs appointed by **six Parliamentary Committees**.

With the exception of the Committee on Industry, Research and Energy, which appoints 4 Members, each of the following committees appoints 2 Members:

- **Agriculture and Rural Development;**
- **Employment and Social Affairs;**
- **Environment, Public Health & Food Safety;**
- **Industry, Research and Energy;**
- **Internal Market and Consumer Protection;**
- **Transport and Tourism.**

With the inputs of Committees and individual Members, the STOA Panel, on the recommendation of STOA Bureau, decides on STOA projects and other activities.

Each STOA project is supervised by one or more Panel members.

The **STOA Bureau** is comprised of four Members:

- **Oldřich Vlasák**, EP Vice-President responsible for STOA
- **António Correia de Campos**, STOA Chairman
- **Paul Rübig**, 1st STOA Vice-Chairman
- **Malcolm Harbour**, 2nd STOA Vice-Chairman

European Parliament

Directorate-General for Parliamentary Research Services

Directorate for Impact Assessment and European Added Value

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