

Participative Approach in Technology Development Danish Experience from a Hungarian Aspect

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Abstract

The long tradition based democracy in Denmark proves to be a well up built basis and a provided sound background to accept the challenge of the gradually accelerate and more rapid changes of technological risks involved by the application of newly developed technologies. Active, public-close risk communication and public participation are commonly applied in order to reach a widely based consensus to harmonize the different systems of values in the society. There is a long-standing tradition for active communication among experts, politicians and the general public concerning opportunities and problems associated with technological change. In the surroundings of democratic culture of managing technological conflicts in a multipolar society, the stakeholders' opinions are considered thoroughly carefully and are handled in an efficient way. It may contribute to the accomplishing of the aim of establishing a more democratic governance of technological risk. The assessment of risks related to technology are carried out in a way, where the need that laymen should start by formulating questions to the experts is emphasised more rather than experts starting by analysing risks. The possibility for participants that they can influence the decision-making processes in an early stage has a real effect on the development decisions. The participative methods, which are used in many levels of the society create a democratic basis for decision making on technology development, showing a recommended procedure of techniques, being a great part of culture and attitude, to the countries like Hungary, trying to establish their way.

1. The Danish Attitude Towards Social Debates

The social debates of the stakeholders and the involvement of the public in the specification of the aims of developing technologies have been a long, experienced practise in Denmark, following a democratic approach in the development and innovation processes. The basically technological origin changes have been entrenched in society implicated number of conflicts and generated debates of the different aspects represented by different groups of society. Beside the result of creating consciousness about technology developments through a dialogue between the different parts of society, the enterprises and public institutions can be

motivated to emphasize their efforts on those technological development activities that is suited to the needs of the society and appropriate to the forces of the market.

The Danish approach to environmental policy and technological innovation aimed at providing solution to environmental challenges, has been based on participatory democratic tradition of bringing various stakeholders or interest groups together in order to reach consensus, as in many other areas of social and political life, and advise the responsible authorities. In the debates all interested parties are assumed to have a legitimate right to negotiation. Both in the cases of raising issues and restructuring institutions or administrative procedures, stakeholder's participation in the decision-making process is essentially used, whose success was established in the Danish educational system providing outstanding background to the discussions on social and cultural issues. Citizens attach high priority to environmental protection, and the industry seems to act in a sensitive way to the environmental requirements. The broader Danish discussion of technology was influenced with its emphasis on including and informing the public, mainly by the view of general education and public debate that is an important element in Danish society's democratic tradition, as well as the practice of public information and debate through grassroots movements. The Danish experiences in environmental management and cleaner technology have become important elements of developments. Furthermore the active Danish participation in international environmental debates and the dissemination of applied participative technology assessment methods should be highly emphasised.

2.The Need for Analysis in Hungary

The analysis of the issue requires the consideration of the Hungarian social and political background, which went through a great change since 1990, forming the basis of a more democratic approach of handling the conflicts originated from either environmental issues or technical aspects. In the last decade a number of new laws have been enacted to create framework for public participation mostly in environmentally related decisions and gradually the participation of various stakeholders could assist the elimination of expert preconceptions as well as the emergence of new alternatives and perspectives. However, nearly in none of the cases did public participation programmes systematically accompany the legislative process.

The siting of industrial and infrastructure with potential negative impacts on the environment has become a burdening experience in Hungary, as in many other countries. Due to the legal framework, which guarantees the publicity of environmental data and provides for some degree of public involvement in facility siting decisions, as well as strengthening the civil society, public protest against the construction of energy producing and waste management facilities, highways and bridges have become more frequent and vehement. However, the practise of environmental conflict management, the tools and methods applied for resolving siting controversies have not developed in accordance with the requirements in the early period.

Later, in some processes like the siting of spent fuel storage facility in Hungary in the early 1990s, the problem has been approached in a proactive way, contrary to the reactive approach followed in the case of the low- and intermediate-level waste repository. On the other hand, the project of the PHARE program administrated and supported by the European Union, started in 1996, directed at the developing water quality legislation was the first attempt in Hungary to apply direct public participation methods in rulemaking from the early stages of the process. Given that Hungary has virtually no history of cooperation between those who

bring new legislation, relevant experts and those affected, the significance of this project extends far beyond the bounds of water quality management, and can be considered as a starting point as a general model of public participation in Hungary.

Many cases of industrial facility siting with different results show a trend leading to the complex management of environmental conflict management with the emphasised role of public participation. In these cases the representation of the seed of a new culture in environmental conflict management could be seen and it has been considered to be a role models of the machinery for making environmental-related decisions in Hungary. The appearance and strengthening of Non-Governmental Organizations also show the tendency of the changing attitude in the society. Some of these well-known institutions focus their activities on the increasing of public participation and the public's access to information in environmental matters.

Since 1992, OMFB (Országos Műszaki Fejlesztési Bizottság; National Committee for Technological Development) has been officially engaged in analysing the international experiences with TA as well as examining the possible introduction of TA to Hungary. This work has been done by an experts' committee with the aid of well-known foreign specialists. The former studies and conceptions of OMFB also considered the aspects of environment and society, but it was widened by this development. The elements of TA and its related activities have appeared in the practice and interest fields of universities and research institutes. Later it resulted in the gradual appearance in education and research as well. The role of OMFB and the studies of Institute of Social Conflicts of MTA (Magyar Tudományos Akadémia; Hungarian Academy of Sciences) and also the Budapest University of Technology and Economics should be highlighted in this area. The dissemination of TA methods in Hungary and the implementation of the necessary advisory bodies operating for the Hungarian Parliament and for particular ministries of the government are essential to create the background for the handling of the new challenges in governance. Naturally, their adoption is only possible by taking the special domestic features into account. The establishment of TA should follow the pattern of the countries having long experience in the field, avoiding the disadvantages of the early models. The methods of participatory-based constructive technology assessment should be applied to increase the role of the public in the decision-making process. The domestic possibilities of these techniques framed by political and social approaches and the regulatory background should be considered to be widen. The creation of TA as a culture through multilevel education and national system of TA would be essentially needed as a background to an effective long-term process. Despite the fact that in many countries like the Netherlands (Twente University) or Denmark (Aalborg University, Technical University of Denmark, Roskilde University) TA is having an emphasised role in technical education, courses in Hungary were only introduced at the Budapest University of Technology and Economics, yet. The disseminated, and widely applied active participative approaches must be used on most of the levels of the society and through the arranged wide debates the population has the possibility of forming its own assessment of the new technology. In a multi-stakeholder processes a methodological framework is needed to promote the interaction between the various parties and support joint decision-making.

3. Participative Approaches in Denmark

I had the possibility to visit many institutions in Denmark dealing with constructive technology assessment emphasising the importance of public participation and also some of the advisory bodies of the Parliament and the government arranging social debates on

technology development. The gathered knowledge through the interviews with the experts makes possible a kind of applicable knowledge transfer to Hungary, where the organizations concerned with the handling of the problems in relating fields with real effective methods are mostly in the early state of the forming of an effective institutional background. The analysed aspects may contribute in a way to the establishment of a well-organized structure for institutions with shared fields of operation and focused activities.

I could get an insight to the operation and main projects of the Danish Board of Technology and the Danish Centre for Evaluation and Health Technology Assessment. I could also visit The Danish Institute for Studies in Research and Research Policy, the Risø National Laboratory and the constructive technology assessment centres of the Roskilde University, Aalborg University and the Technical University of Denmark.

The Danish technology assessment activities have strong participative and constructive elements with the involvement of a multitude of different groups and players such as politicians, scientists, technology developers and lay people. Political debates led to technology assessments characterised by a comprehensive approach and with the emphasised consideration of environmental, working condition, health and socio-economic consequences. The Danish activities are to a large degree transformed into proactive, dialogue and participation oriented TA approaches. The participatory and constructive emphasis in many of the TA activities is a distinct characteristic of Danish TA activities.

Participatory-based constructive technology assessment creates a framework of a dialogue, where researchers and users acting as opponents to solve the problems. It emphasis problem analysis and combines a range of possibilities during the processes. During its activities it couples to a multitude of decision-making processes. The constructive approach aims to ask the right questions compared to the traditional way dealing with the finding the right answers. On the other hand constructive technology assessment creates room for participation and influence to make an effective framework for democratisation of the decision-making processes by demonstrating possible ways of acting and encourage learning processes through dialogues.

Participatory TA methods are suggested to be a possible way for a direct, interactive inclusion in the TA process of affected social actors, such as interest groups, consumers and members of the general public, alongside professional experts and policy makers. The EUROPTA project (European Participatory Technology Assessment, Participatory Methods in Technology Assessment and Technology Decision-Making) co-ordinated by the Danish Board of Technology, has been carried out from March 1998 to December 1999 by 6 partners with the aim to advance the understanding of the role of Participatory TA, to help the further development of it in practice, and to give guidance for the implementation of participatory methods as a support function for public discourse and decision-making. The project basically intended to advance the understanding of the role of Participatory TA by critically assessing the experiences to date of different European national participatory initiatives, to identify criteria for the practical implementation of participatory methods, and to contribute to the development of participatory methods and practices in technology assessment. The results show the need of transnational implementation of Participatory TA in Europe, simultaneously among EU member states, aggregated on European level.

An important part of the Danish TA dialogue and participative experiences were gained in the 1980s as part of a Danish programme for social experiments with the use of information and communication technology related to the development of a new telecommunication infrastructure. A political agreement for a cable network led to a new type of research that

consisted of extensive local experiments with the new technology. A special experimental participatory activity was established as the result of a parliamentary decision on investments in a Danish broadband data transmission net. The aim of the parliamentary decision was to ensure that people in the near periphery would be able to benefit from the net and would have equal opportunities. This was attempted by providing education of users as well as user participation. The implemented experiments were, covering a wide range of information and telecommunication technology applications. This research examined the role played by the interaction between the involved social actors in the actual implementation of the technology, and thereby also revealed the unpredictability connected with the development process. A search and learning process was formed with a dynamic interaction of understanding and change within the frame of a practical test of technology and new organizational forms enabling the participants to understand the potentials and consequences, and thus providing a new basis for change.

In Denmark information technology was the main field of the practice of the approach. During the period of 1983 to 1990 technology assessment activities were also included in the Social Science Research Council's Technology-Society Initiative, which was financing 38 research projects amount to 23 million DKK in this field. The results led to the identification of a range of shortcomings in the technology and inspired innovation in the development department of the telecommunication company. The social experiments contributed to the appropriation and social shaping of the information and communication technology. On the first hand, for potential users they provided an opportunity for learning about the technology and its organisation. Second, development departments and suppliers learned a lot about users and utilization patterns and how to comply with non-professional user needs and expectations. Third, suppliers and users constructed new services and markets. These experiments were unique efforts of creating a dialogue on the role of technology and the use of information technology in the society. The experiments were mostly geared at local development, technology assessment and the decentralized use of technology. The established centres provided opportunity to the local population to judge, through participation in courses and practise, how they would benefit from the using of the technologies. The experiments were oriented on many sectors, involving the educational-, health-, housing-, cultural- and public sectors with also projects done in the industrial and business sector, highlighting the importance of fishery industry and the target groups of farmers in the experiments originated from the characteristic of the domestic situation. The idea that technological renewal consists of a continuing series of minor developments and implementation experiments became more and more dominant. Involvement of the groups affected by a technology thus became important, since users influence the direction of technological development and in the end safeguard the success of the new technologies.

4. Institutionalisation and Participative Methods

The increased need for a political advisory body to politicians and the fact that the debates on new technology have become broader and more important, lead to the establishment of The Danish Board of Technology. It is an independent body established in 1986 by the Danish Parliament to disseminate knowledge about technology, its possibilities and its effects on people, on society and on the environment. Besides making TA projects and gathering information about the relevant topics to the parliament, it has been dealing with social debates, based on technology development and innovation. The Board is supposed to promote the ongoing discussion about technology, to evaluate technology and to advise the Danish Parliament and also some of the governmental bodies. The Danish Board of Technology

receives its own funds and has its own secretariat and a politically independent leadership with participation from interest organisations.

The Danish Board of Technology annually calls upon members of Parliament, various authorities, organizations, business enterprises and individuals to come up with suggestions for topics for the coming year's efforts. The institution carries out a number of projects of varying dimensions with the aim to assess new technology being of current interest to the politicians and the citizens. The subjects possess a technological content with the essential need of participation of large number of people in decision-making to democratically arrange the problems and conflicts caused by the technology. To maintain a broad and public perspective, the Board of Technology focuses on that discussions and research results are disseminated to the broad public through reports and memorandums to the press and politicians. The Board also actively supports the TA activities of non-governmental organisations. During its operation it has been helping to qualify the discussion between the public and the decision-making level, by using and developing new participating methods. The Board of Technology follows international technological development and disseminates information on technology assessments and methods of technology assessment in other countries. These activities are made possible through its membership in European Parliamentary Technology Assessment Network (ETPA).

The task of contributing to the development of methods for assessing technology, especially methods involving the citizens affected by the technology in question is essential. Among several employed methods of public participation, special Danish techniques have been developed. The unique Danish participative models as consensus conferences and scenario workshops are widely used in different fields with an emphasised democratic perspective. The focus of both methods is to create a framework for the necessary dialogue among policy-makers, experts, lay people and other possible stakeholders about technology, policy and society. Since the dialog process gives the possibility of the creation of new usable knowledge at all stakeholders' side, it is a continuously established long-term social advantage on wider basis of society. Using these methods politicians can be aware of the attitudes, hopes and concerns of the public, so the participative systems can be effectively support decision-making to a certain extent. The main aim is to create a connection between research and development activity, and the needs of society. The topic of debate should deal with the assessment and choices between different types of technology, which has current social relevance.

The importance of the consensus conferences must be highlighted in the effective establishment of a framework for social learning beside its role in participatory decision-making. Practically, wide ranges of stakeholders participate in the process in an observer role, beside the continuously appeared expert and lay board. Most of the experts and stakeholders usually repeatedly appear in different consensus conferences, and the intensive interactive confrontations with new aspects represented by the lay people, effectively form a multilevel learning process. Results appear in the levels of lay people and experts, experts and experts, and moreover, also a wide range of stakeholders can directly realize their different aspects. This learning process creates flexible attitude towards the management of technological changes in the society, providing effective background for the handling of continuous technological development.

The large scale of public participation methods beside the two above-mentioned ones have a great basis and practise in both Denmark and in the Netherlands, with the tendency of continuous development of the methods. Future workshops and their further development, the dialogue workshops, which aims to include the experiences of all participants in the debate,

are widely used mostly in Denmark. The constructive technology assessment centres of the universities in both countries participate in the democratic development of the society through arranging 'science shops'. In the Netherlands all the thirteen universities have one or more science shops, for instance at Technical University of Eindhoven there are nine science shops managed on voluntary basis. In Denmark the Technical University of Denmark and the Roskilde University organize these activities. The fundamental aim for the science shops is to secure possibilities for the general public to initiate investigations at the universities. In this way the universities not only keep in contact with the surrounding world, but forming an active communication with the public. The knowledge communicated by the science shops affords the opportunity for scientists and also to students to co-operate with organizations not involved in the academic world, resulting in an early experience and deeper understanding of the importance of knowledge communication in a comprehensible language.

In a number of government-funded R&D programmes to support development of cleaner technologies, new energy technologies, information technology, and food technologies, TA has been supported as an element in the decision-making process, but also integrated into the development of the funded activities. This funding has also helped to create a number of research groups at universities (Technical University of Denmark, Roskilde University and Aalborg University). Especially the Technical University of Denmark and the Aalborg University have been engaged in both the development of TA methodologies and lately also in developing the new perspectives in technology foresight.

Beside the Danish Board of Technology many more institutions have been established later in Denmark to help the decision-making processes and the participation of the interested parties or their representatives. These institutions worked beside each other, but when it was needed the centralized and decentralized institutions operated together. Nowadays, after many institutions have changed or merged the existing ones representing the most important areas. Danish Council of Ethics provides advice to the Danish Parliament and raises public debate specifically about the ethical problems raised by developments within the national health service and the field of biomedicine. The Danish Centre for Evaluation and Health Technology Assessment provides advice to the government and contributes to the quality development in the health services by carrying out analyses and assessments mostly in relation to new equipments and treatments comparing the existing ones to the advantages and consisted risks of the new ones. HTA in Denmark is oriented toward the public in the sense that various parties of interest participated in developing HTA over the years and formulating a national HTA strategy. The decentralized Danish HTA also uses the advantages of consensus conferences, where the issued statements are directed to the public and decision-makers in policies and administration.

During the advisory processes two-way communication works, which makes it possible to the institutions to draw the attention of politicians to some topics in the need of further discussion. Assessments relating to decision-making provide requested information in a relatively short time, from 2 weeks to 3 months depending on the topic and the urgency of analysis. Many of those institutions, which operate as advisory bodies to the Danish Parliament or to the Government, beside collecting required data to decision making, arrange social debates about the socially controversial topics of new technologies, providing a real efficient bridge between technology and society, involving the different views of decision-makers, experts and the public. With the help of these institutions active debate can be created about the concerned technology, generating democratic assessment of technology and decision-making, which results in more democratic development of technology.

Acceptance of risk is not solely based on knowledge, but also on values, attitudes and the culture of the individuals. In the approach of risk, ethic is going to be an increasingly appearing factor to take into consideration in technology development. The increasing costs of research and the effects of the market rules requires a complex assessment of technology in an earlier stage than before and also the increased involvement of the stakeholders.

The business community has been involved as an important actor in the discussions, but at the same time generally responded with scepticism toward the role of TA based on the critical discussion on new technologies. Thus, technology assessment as a formalised methodology has not very often been used in the business community's own strategic technology planning. Partly due to the history of technology controversies, and partly as a consequence of its link to public discussions and the parliamentary institution, the methods have not been used very much by companies. Also, business and industry organisations have held sceptical views about the concept, since the initial controversy on stakeholder-based research, but these have recently been taken up to revision, and a renewed interest in the methodology has led to experiments within the framework of technology assessment and mostly by technology foresight (TF), but in most of the cases it is difficult to distinguish clearly between the two fields.

The emphasised active participatory approach appears on more levels of the society and also in organizations. Firms also follow the way to involve their employees in the development processes of the working facilities, like in the projects in connection with the development and implementation of new technology in the meat industry. The possibility to specify needs, and to exploit competence and local usability, and of course having an added value to the competition on the targeted market also requires the participation of consumers to specify their needs, opinions, attitude towards the products, mostly in the appearing of new technologies and techniques. In the developing of the project on organic bread from 1990 to 1992, carried out by researchers of the Technical University of Denmark, many stakeholders were involved like the food workers trade union, the national consumer council, an environmental organization. Consumer targeted complex technology assessment with public participation can be recently seen mainly in the pharmaceutical sector, where the great expenses of research and controversial public opinions meet in a special way. The process, involving stakeholders early on and throughout the process has the advantage to guide the enterprises in a way that they can improve their impact and ability to compete.

Some of the major companies engaged in technology assessment and recently also in technology foresight have been NKT Research (the research facility of a big cable conglomerate), Grundfoss (water pumps), Oticon (hearing aids), Danisco (sugar and food products), TeleDanmark Research (research in the privatised, former national telecom), Novo (enzymes, medical products and biotechnology), Danfoss (compressors and automation equipment), Lego (toys), Bang & Olufsen (radio and television), and Ericsson and Nokia (among others products, mobile communication equipment). Although some of these are not only Danish-owned or Danish-situated companies, or subsidiaries of trans-national companies, their Danish R&D facilities have been heavily engaged in planning for technological renewal with strategic parts of their development facilities located in Denmark. The activities within these companies have varied, but they have all formalised their technology-planning activities by using methods from technology assessment.

The involvement of stakeholders is getting more and more required as more questions are arisen concerning the public. Most of the institutions, universities and laboratories have a tendency to move toward the application of technology foresight, mainly in the evaluation of research's goals, emphasising more the dialogue activities and analyses of long-term

developments in science, technology, economy and society. In the cases of long-term scientific and socio-economic developments there are rapidly accelerating need to identify technologies, which may have economic, or a broader societal significance. This type of knowledge is crucial in making national priorities for allocating resources to research, development and education in both public and private contexts.

Especially the controversies on biotechnology have opened a new interest in TA as a way of creating a better understanding of the public concerns, leading in the later years to a more open interest in both TA and the methodologies developed under the framework of technology foresight. In the concept of technology foresight, the intention is to move the focus to a more innovation-process aspect, building on open-ended technology scenarios and technology-shaping perspectives. The field of analysis for making forecasts of futures research is much wider than TA's, with a longer time horizon. The role of TA and CTA and their methods remain essential in most of the decision-making processes, where advice must be given in a relatively short period of time, considering the complexity of the current situation, the involvement of the participants and realistic possibilities of actions in the current time relay on the actual resources and range of actions.

Conclusion

The main challenges for Hungary, in the analysed topics connect to the effective formation of the background of the legal, social, and political factors, which determine the application and focus of the practice of public participation and which is basically promote or hinder the implementation of competent and fair procedures, and social learning processes, taking place in the field of communication, collaboration, and conflict management. It challenges the institutionalisation of technology assessment, with its application on an up-to-date level, avoiding the disadvantages of the former practises. Beyond the establishment of the cultural and institutional background of TA and implementation of the multilevel participative approach of the Danish and Dutch experiments, trying to adopt the techniques to the domestic social, political, and institutional background, the outstanding institutions should participate in the co-operative work of the European organizations establishing effective connections, which create the background of applicable knowledge transfer and dissemination.

In a society based on democracy, it is crucial to ensure a qualified debate among people, when a new technology is appearing or a decision on technological development is going to be made, even if they do not possess expert knowledge. Applied active participative approach must be used in the most of the levels of the society and through the arranged wide debates, the population has the possibility of forming its own assessment of the new technology. The continuous exchange of professional insight and users' experience results in the generation of new knowledge for the society. During participation, learning processes are being formed, which create the basis of an up-to-date knowledge society, capable of managing the new challenges of other later appearing problems of technological changes and choices, facing in the future.

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