

IDENTIFICATION OF FACTORS INVOLVED IN FORESIGHT PROJECT EFFECTS ASSESSMENT

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ABSTRACT

In recent decades, foresight has been considered as an efficient tool to succeed in governmental and private sectors policy making, and many institutions use this technique to achieve the goals with long-term horizon, meanwhile it is very important to study a foresight project effects and outcomes. Therefore, this paper is aimed to introduce foresight project and effects through development of foresight effects evaluation project. This project introduction is based on literature review of research. A range of identified effects in main foresight projects is related to four groups of effects including increased awareness, notifying, potency and effectiveness that is necessary with rapid growth of foresight, specialists guidance in design and appropriate management of foresight effects evaluation project to achieve maximum effects and clarify investment worth in foresight for planning.

Key words: foresight, impact assessment, awareness, notifying, potency, effectiveness

1- Introduction

In past five years, foresight effect evaluation is interested increasingly. Those who use foresight, or investing on its activities, are looking for evidences of extent, value and outputs, which can be obtained. Foresight continuous growth depends on encouraging presentation of its value. Since using foresight tool requires time and resources, it is reasonable to expect its accuracy and intensity to be evaluated compared to other tools. In a generalized evaluation framework, three main tests can be used. These tests include accountability (whether foresight is run efficiently or not), justifiability (whether foresight results justify its costs or not) and learning (how foresight can be done better). To this end, significant efforts have been assigned to develop an appropriate typology of foresight effects, based on which we can develop a strong impact assessment system.

2- Research background

- Foresight

Almost in all fields of study, future management plays an important role; however, this concept has different meanings in management. This concept is widely used in decision-making , and according to the type and amount of information ,which is available to decision makers, decision making is divided to three categories ,including (1) decision making under confidence conditions (2) decision making under risk conditions and (3) decision making under insecure conditions. First, a situation must be described, where decision-maker predicts exactly what happens in future. Second, decision maker cannot predict future progresses, but he/she is aware of all possible developments and knows how this development is possible. In this case, future is defined in a certain range. In third case, decision maker knows that future developments are possible, but it is more likely than second case. In this case, decision makers' objective is to create a link between future developments and current status of organization. The third case is discussed in foresight studies. Foresight term was used in management sciences, social sciences, etc, since late 1980. Experts' tendency toward foresight is formed of three separate perspectives. These three perspectives include: (a) strategic planning, b) forethought and (c) networking.

- Networking

As it can be implied from foresight definition, output of this process is better prediction and formation of long-term future. Meanwhile, an extensive range of opinions and experts' viewpoint regarding each aspect of studied issue is required. Networking is one of the necessary measures in foresight process prologue. The team that starts its activity at this time is responsible for better development and management of network in terms of efficient communication between members for its effectiveness. This network, members can be divided to two groups, and each of them have a significant effect on decision making process. Industry experts, which members are selected from academics, industrialists, government officials and chief scientific adviser, and second group including foreign stakeholders, shareholders and policy makers affect made decisions directly. There is no rule regarding selection and number of participants in foresight process network and their number depends on some factors such as: project objective or extent, decision quality, data collection time and available resources.

- Forethought

Forethought can be defined as short term but continuous activities in main process of foresight and foresight general trend is formed of these activities. Other important features, which are obtained by

foresight in this way are scientific validity, being structured, massive, extensive and long term perspective toward issue, continuous activity, having cause and effect framework, a tool for knowledge transmission, less attention to output of process, focusing on human forces and motives and try to improve consensus formation between members. One of the consequences of foresight for managers is considering the fact that exact recognition of future is not necessary, we just have to be ready for future, and it is confirmed and emphasized by many experts. It indicates necessity of applying strategic management for this process planning. Strategic management approach is based on identification of factors affecting the objectives and performance of company in long term, analysis and determination of each factor effect on organization mission and finally organization development perspective based on changes and developments in these factors. Strategic thinking seeks to uncover underlying assumptions and process of factors change since present to future passes through its evolution thinking and includes required planning to achieve the development aligned with these evolutions (Shah Mansouri , 1392).

3- Developing a framework to evaluate foresight effects

According to three generations of foresight projects, different effects must be expected from various generations of foresight. As a result:

For first generation of foresight, key issues include foresight accuracy and publication of results (for non-experts). In second generation, key issues include priorities acceptance and establishment of networks between industry and university participants, while third generation involves stakeholders investment in evaluation and requires evidences of foresight culture emergence (Georghiou, 2001).

These generations should not be considered as sequential or that a generation is necessarily superior to another. For example , strong growth in horizon monitoring, foresight first generation method, indicates that this method and its relevant objectives are still considered as appropriate and directed by some decision makers toward relevant goals. Hence, objectives and methods of each foresight generation is still appropriate in certain conditions, but requires its effect criteria (Johnston, 2007).

An alternative view involves four role for foresight: expert-based informative tool, inseparable part of policy processes, which works with strategic support of informative functions, regulator through making capacity (including structural capacity) for policy intelligence and a tool to assess the effect. It is clear that each of the roles imply different objectives, contexts, execution method and effects (Schartinger and Weber,2007).

Detailed review of foresight effects issue is detected on execution policy and six functions of foresight for policy making ,which includes notifying ; namely developing new insights, facilitating implementation to raise awareness of challenges ,which must be addressed , participation contract and facilitation, support and converting outputs to specific options, system reconfiguration (to be more capable in response to long-term issues); and having a symbolic function,which represents a rational method. In other words , effects related to each of six fuctions include : input efficiency , knowledge development and networking , participation of stakeholders in process, efficinecy of foresight outputs conversion, increased tendency and capacity of policymakers and policy making institutions , and finally foresight admission as a ideal planning and management method (Da Costa et al. 2008).

These concepts have been refined and it can be concluded that foresight helps decision makers by providing three functions of notifying and integrated findings related to dynamic changes, future challenges

and options, foresight insights and integration of results with strategic positioning perspectives and facilitating the implementation by developing common views among stakeholders regarding desirable developments in future ,and thus their actions coordination (Havas et al. 2010).

This model has been used to develop a framework for classification of foresight effects (table 1). Useful groups of foresight are identified for three functions and according to short term or long term period. Following sections are proposed to develop a framework efficiency project. In addition, it is attempted to develop frameworks to assess related foresight outputs , in which outputs , effect on formation of new industry-science networks , partnership in objectives quality and regional partnerships are identified. Possible criteria are provided for each output (Georghiou and Keenan 2008).

In addition, matrix method is developed for typology of effects , different effects aspects include : increased knowledge , formation of attitudes/ comments and type of issue - technical / scientific, social and policy. In this matrix, some extensive effects are detected, such as new tendencies in established policy and implemented innovations. Measurement is conducted , while consensus realization is very difficult in judgment of such extensive effects. Finally , based on extensive literature review of foresight, foresight benefits and advantages include national strategy production, prioritizing resources , changing existing institutions and creating partnership between factors, intelligent systems promotion and simulation of information exchange , making warning systems, communication and coordination , to promote social learning processes and knowledge management, Simulation of innovative policy making, innovation environment promotion, affecting organization efficiency and affecting new product development (Yuan et al. (2010)).

Before completion of appropriate frameworks analysis to evaluate foresight activities effect, some useful initiatives to describe and guide foresight fuction are explained in order to maximize its positive effects.

Table 1: a framework for classification of foresight effects

Function	Time horizon	Desirable or undesirable effect
Notifying	Short term	Increased knowledge about the field involved in issue Individual learning: knowledge of science, technology and innovation , More clear view of other stakeholders , development of foresight skills in a broader cycle , developing a new network through discussion in new groups of experts and stakeholders and knowledge network
	Medium	Realization and continuity of common understanding through notifying
	Long term	Integrating new players and their views and inputs in a society ,which form an area of social responsibility
Advisory	Short term	Clarifying objectives and hidden topics and applying effective measures
	Medium	Offering recommendations and identification of options , rapid learning processes activation and support , identification of hidden obstacles in introduction of processes with awareness , transparency and more participation to control
	Long term	Affecting public and private players' plans (research / policy) , development and implementation of new policies, integration of foresight elements in processes within organizations
Facilitator	Short term	Social learning processes , developing common views of future, establishing long-term perspectives Awareness of process change systematic characteristics
	Medium	Developing networks for action follow up activities new projects
	Long term	Adoption of foresight results in organizations instruction topics for various educational topics Increased coherence of policies Cultural changes toward systematic and long-term thinking

Georghiou and Keenan (2008)

4- Foresight management and development guide

An example of effective foresight plan, where execution, publication and evaluation of a central component is presented by UK foresight plan . Its main features include:

- Adopted by minister or ministers related to project to support it, adopted by high-level stakeholder groups and managers, who are responsible to support implementation.
- An extensive process of stakeholders' participation including request from stakeholders for identifiable measures to implement the results of project.
- Preparation and providing an executive plan, when extensive measures are specified for efficient execution.
- Publication of activities , by which foresight participants promote findings in different governmental institutions and departments and other groups in a significant period (1-3 years) and act as medium to for facilitate its admission and understanding
- annual review after each project , which is based on stakeholders information regarding the effect of foresight report and its application and execution method. This model presents an appropriate basis to show foresight effects. Make sure that commitments to consumer as well as communication resources are provided and process is pre-planned. Establish clear expectations and measures for performance evaluation. Always keep in touch with process leader. Propose the messages in simple language and improve and control the effects by continuous follow-up, and finally convert process outputs to decision and policy outputs. Methodology, funding and proper techniques alone are insufficient for foresight project success. To be successful, foresight plans must focus on identified consumer and create a clear link between future (subject and process) and policy outlines (Calof and Smith 2008). Based on official evaluation of foresight projects, it is acknowledged that failure has a weak relationship with performance and strong relationship with initial political positioning. If the plan has main channels, so that decision makers have a sense of ownership and they are ready to be considered, it seems that it has greater effect. If the plan is supported by an organization, which is not desirable, regardless of quality, foresight is less effective. Eight critical factors for success in foresight plans under government guidance ,were identified:

- Focus on exactly identified consumer.
- Establishing a clear relationship between foresight and policy outlines.
- Strong partnerships between public and private sectors.
- Development and applying methods and skills, which are not always used in other sectors.
- Ensuring about clear communication strategy.
- Integration of stakeholders with foresight plans
- Taking advantage of educational capacity
- Finally, it is worthwhile to note that effect perception varies with characteristics of respondents (Cagnin and Johnston 2011).

Understanding of effects on policy making is studied by scientists, who participated in implementation of Japanese Delphi method. Effects perception is greater among young people, people working in industry than people in university, people working in the fields of research and development and those, who are closely related to method implementation (Yoda2011).

Foresight effects project

Despite the efforts described in previous sections, development of a coherent and agreed framework to assess foresight effects had a slow progress. A large number of implemented projects by foresight industry pay little attention to effects. Where foresight effects are considered as outline, methods are often separated, and are not able to take advantage of knowledge. With rapid growth of foresight application, experts' guidance is necessary for appropriate development and management of all processes related to foresight to achieve maximum efficiency. In order to achieve this goal, a foresight effects evaluation project has been developed.

This framework objective is to provide guidance in development of an appropriate effects evaluation protocol with any foresight project, and to determine exact details required for foresight expert, considering objectives and other underlying characteristics of project.

This project particularly focuses on adaptive foresight, where objectives must involve in improved planning and strategic considerations within organizations and existing structures. In addition, a conversion or disturbing type of foresight has been identified, which is aimed to change subjective patterns. It is clear that a different set of groups and efficiency indexes is required for this type of foresight. Thus, previous works mentioned in this paper are applied, and four types of effect are achieved.

- Increased awareness, increased understanding of the target audiences regarding foresight requirements, value, attitude and methods in response to challenges.
- Notifying, to present conceptual and empirical information to help you achieve a more efficient and effective planning and decision-making.
- Empowerment, to provide or develop capacity for more efficient employment
- Effectiveness , formation of thinking and outputs related to it

Table 2. Aspects of research model

History (Foresight projects)	Aspects of model			
	Effectiveness	Empowerment	Notifying	Increased awareness
Reported impacts of UK(2004)		✓	✓	✓
Johnston (2005)		✓	✓	✓
Reported impacts of UK(2006)	✓	✓	✓	
Schartinger and Weber (2007)			✓	
Reported impacts of UK(2007)	✓		✓	✓
Da Costa et al. (2008)				✓
Reported impacts of UK(2008)	✓		✓	
Georghiou and Keenan (2008)			✓	✓
2012)(Johnston	✓	✓	✓	✓

Source: foresight research group

Increased awareness is often indicated with increase indexes in foresight awareness , using foresight in planning and decision making and consideration of issues in long term. Notifying is determined with indexes such as policy and plans, which use foresight concepts, findings and data, words emerged from foresight, monitoring capacity and research priorities change according to foresight findings. Empowerment can be

reflected in increased foresight applications in planning and management, more competence in management of uncertainty, a strategy for longer periods and evidences of higher levels of understanding in society regarding the methods to meet major challenges and uncertainty. Effectiveness is reflected in a range of outcomes, such as redevelopment of strategy and long term policy according to learning from foresight, increased cooperation in response to major issues of future, support structures of future-oriented research , coherent and more cooperation among organizations and higher levels of confidence in governments planning and decision making processes.

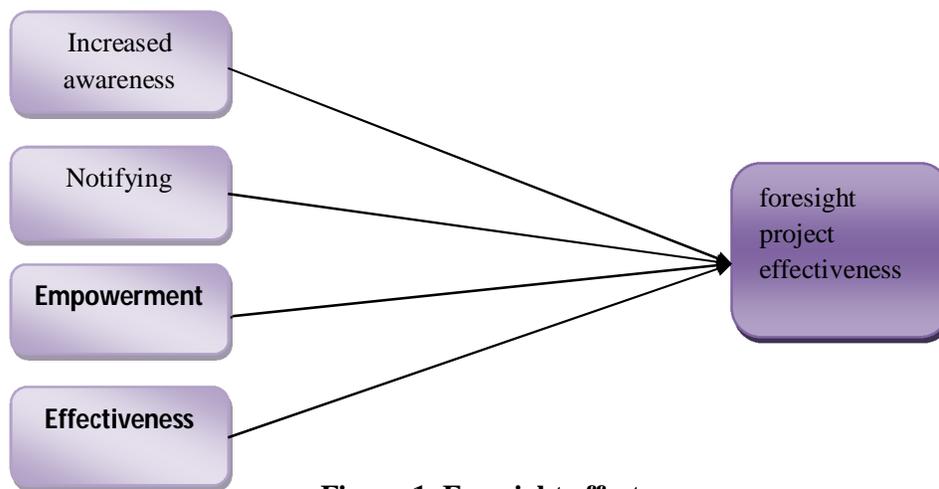


Figure 1. Foresight effects

Typical results and possible criteria for each of the four groups in foresight efficiency are identified. These groups are not distinct, and may overlap, and in some cases clear and precise differentiation between certain types of effects can be difficult. In addition, usually more than one type of effect may be achieved. In fact some aspects of effect may reveal as parallel, whereby next effects depend on initial effects availability, for example notifying may occur after increased awareness effect. In addition, it must be understood that obtaining appropriate effects is more critical than obtaining the greatest effect. For example, a capacity making method, which affects “increased awareness” and “notifying”, may be better than effectiveness method in a certain issue in terms of its ultimate effects.

Results

With rapid growth of foresight application, experts’ guidance is necessary in development and management of all processes related to foresight to achieve maximum effectiveness and show investment value in foresight for subsequent policy and planning. Foresight effects evaluation project is aimed to present guidance in order to facilitate and more efficient evaluation of effects. However, each foresight project must change according to requirements. A range of potential outcomes and standards were developed for each group. This list is not complete, by no means. In fact, this project enables experts to add more cases based on their experience. Hence, this project must be considered as a document, which needs to be improved continuously. It is clear that in addition to this project, understanding of good execution method with stakeholders’ partnership, proactive implementation and objective evaluation are also necessary.

Table 3. Foresight effects

Type of effects	Output	Possible criteria
Increased awareness	<p>Increased awareness about foresight in all levels, sectors and among all industry participants</p> <p>Increased use of foresight in planning and decision making</p> <p>Increased consideration of issues in longer period of time</p> <p>More focus on long term challenges</p> <p>Adoption of longer time horizon in planning and decision making</p>	<p>Using foresight reports</p> <p>Recognition and utilization of foresight skills</p> <p>proportion of work-time in response to external issues with a time horizon longer than three years</p> <p>motives of major changes reported in annual report</p> <p>scale and impact of direction determination mechanisms and obtained investment level</p>
Notifying	<p>Policies and plans that use foresight concepts , findings and data</p> <p>New methods and issues arising from Foresight</p> <p>Admission of outlines and terms derived from foresight</p> <p>Strategies and decisions that benefit from foresight</p> <p>Establishment of horizon monitoring capacity</p> <p>Development of plans and research objectives</p> <p>Change research priorities according to foresight findings</p>	<p>Using foresight concepts and data</p> <p>Foresight findings ,which are used frequently as a basis for decision making</p> <p>New issues of foresight, which are studied by governmental sectors, companies and NGOs.</p> <p>Investment level in horizon monitoring and using it</p> <p>Change research priorities.</p> <p>Confidence in concepts and foresight</p>
Empowerment	<p>Increased capacity of foresight</p> <p>Increased application of foresight in planning and management</p> <p>Effective communications with foresight community</p> <p>Making new tools and technologies</p> <p>More ability to manage uncertainty</p> <p>Strategy in a longer time horizon</p> <p>Higher level of understanding in society regarding methods of response to uncertainty and major changes</p>	<p>Using specialized foresight skills</p> <p>contract with foresight experts</p> <p>Number of foresight workshops and conferences</p> <p>Internal funds for Foresight</p> <p>Foresight issues</p> <p>Foresight responsibility in senior levels (board)</p>
Effectiveness	<p>Increased development of long term policy and strategy</p> <p>Redevelopment of strategy according to foresight</p> <p>More efficient , more appropriate and timely decision making</p> <p>Increased cooperation with other governments in response to major challenges of future</p> <p>Higher levels of innovation</p> <p>research priorities show focus with longer period of time</p> <p>Support structures of future-oriented research</p> <p>Solidarity and cooperation among organizations</p> <p>Higher levels of confidence in planning and decision making processes</p>	<p>number of departments and offices affected by project</p> <p>value of reported effect (for example, major, moderate, minor)</p> <p>number and scale of foresight projects results</p> <p>National relative performance in goods and services with high added value</p> <p>Public confidence in research</p>

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