NATIONAL RESEARCH UNIVERSITY

Assessing the Effectiveness of Foresight Studies

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Evaluation objectives

- Overall policy goals
- Efficiency of implementation
- Behavioral additionality
- Impact and effectiveness
- Appropriateness
- Inputs
- Strategic objectives
- Foresight activities
- Outputs
- Effects
- Outcomes
- Impact

Requirements towards sets of indicators

M **utually**

E **xclusive**

C **ollectivly**

E **xhaustive**

Evaluation objectives during the Foresight process

Stages of Foresight process

pre-foresight	*recruitment*	*generation*	*action*	*renewal*
• rationale, thematic domain, territorial scale, time horizon, expected outcomes etc. At this stage analysis of STI indicators helps to more precisely identify major issues	• Bibliometric, patent analysis • dynamics of publications • mapping the development of and interconnection between research areas • assessments of new (interdisciplinary) research areas	• detailed description of research fronts • elaboration of scenarios • discussion and interpretation of results • analysis of existing codified knowledge	• prioritization and policy-making	• monitoring and evaluation of the foresight results

Adapted from Georghiou, Keenan 2006

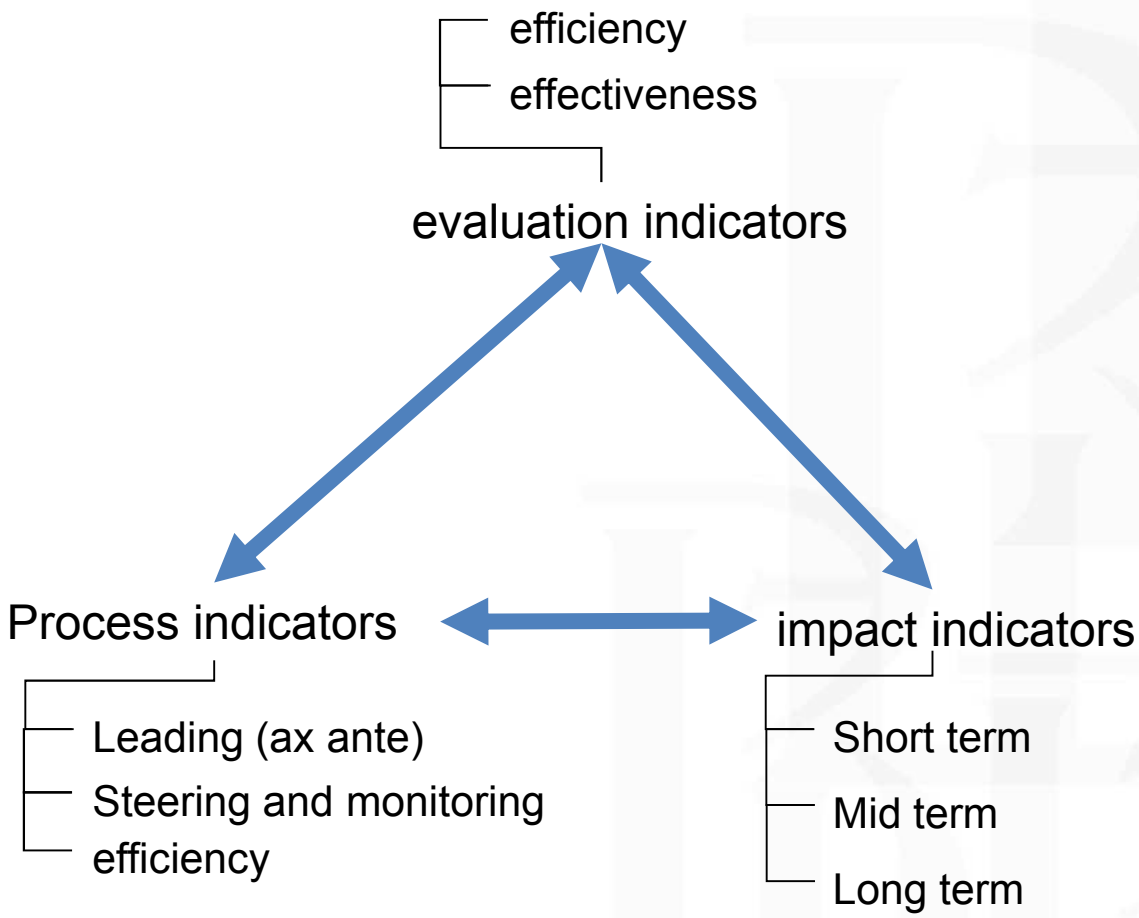
Characteristics of Foresight indicators

efficiency of implementation	• procedural perspective, e.g. organisation and management
	• Typical indicators :
	  • type of people involved
	  • degree of support to expert panels
	  • link to decision-makers
	  • appropriateness and efficiency of methods used.

impact and effectiveness	• Reflect immediate outputs and outcomes
	  • quantitative data:
	  • numbers participating in meetings or surveys
	  • reports disseminated
	  • meetings held
	  • website hits
	• no real assessment of the short and long term impact of these

appropriateness of the foresight exercise	reflect a scenario type style of evaluation centered around the 'what if…' questions

Measurement indicators



Approaches to measure effectiveness and efficiency

Effectiveness

- Project Management Procedures
- (Empirical) evaluation
- International evaluation
- Overall assessment
- Some indicators of impacts and Delphi participation rate
- Thematic panels' feed back
- Accomplishment of the formally set goal in terms of specifying research areas
- No exact measurement, but visible reactions:
  - ✓ creation of a National Foresight Committee after the project
  - ✓ increased public awareness on Foresight

Efficiency

- Project management & monitoring, followed up by review
- Personal and formal information obtained from client and stakeholders
- Overall assessment
- Assessment of change in basic research culture, without metrics
- Comparing with cost of similar projects in other countries
- Benefits not measurable; for everyone to decide

Evaluation indicators

- Effectiveness – “doing the right things”
  - basically long term indicator
  - ask the question if the goals and ambitions of the Foresight study were achieved after completion of the study
  - includes building an inventory of all activities which were done and matching those with the original scheduled activities and determining if the activities have contributed to the goals

- Efficiency – “doing the things right
  - ” assessment of the value achieved from the input of resources, e.g. the ratio of input and output indicators
  - need to mirror not only the actual financial resources spend but also take into account the non financial investments especial the time and know how of experts other than the project team used for conducting the study
  - Usually external experts are not reimbursed for most of her working time they provide to the Foresight study team hence quantifying these efforts in a reliable and solid way is critical.

Impact indicators

- Leading (ex ante)
  - summarize prospected framework conditions and match those with the potential impacts of a Foresight study
  - follow the exploration of a current trend which is derived from past experiences
  - Alternatively qualitative assessment of experts can be used
  - a combination of both methods (trend exploration and expert assessments) is a possible methodology.
  - Leading indicators are thus to considered to be indicative but not necessarily substantial.
  - leading indicators change in course of time these changes are interpreted as upcoming changes in the real situation
- Lagging (ex post)
  - oriented towards describing the past
  - core of such studies is determining if the study was done efficiently, e.g. if the things were done right
  - special caution is required since Foresight studies on average have a 10-20 year time horizon
  - effectiveness can not reliably and trustworthy be determined prior the study has reached its full impact
  - the real contribution of a Foresight study towards any impact generated is difficult to determine after a long period of time since manifold developments influence trends

Impact indicators (ctd.)

- Learning (monitoring
  - main function of these indicators is to provide near time (real time) information about the ongoing project (Foresight study)
  - Besides the information function for immediate reaction these indicators provide a valuable information source for learning in a sense of continuous improvement and further development and adjustment of methodologies and processes
  - Continuous monitoring in terms of regular progress watch and controlling

Input, output, process indicators

- input
  - Measuring the input is a precondition for building and interpreting many related performance and monitoring indicators but also for enabling comparative studies with other Foresight studies
  - include monetary, e.g. financial resources invested, but also a qualitative dimension in terms of composition of human resources, their respective experiences and related.
- Output
  - output of Foresight study can take many different forms
  - results are not tradable goods the value of their results / outputs is difficult to determine in quantitative ways
  - Typical outputs of Foresight studies are scenarios, technology roadmaps, forecasts, analysis of trends and drivers, research and other priorities, policy recommendations and list of key technologies
  - It's not recommendable to gather the number of outputs but rather the quality and newness of the output's content is of relevance. Such is difficult to measure in quantitative terms.
- Process
  - indicators are useful for ex post evaluation of the Foresight study and especially for determining the efficiency of the Foresight study
  - Process indicators combine major quantitative as well as qualitative indicators

Measurement indicators

		Measurement objective		
		process	evaluation	impact
Indicator type	Leading (ex ante)	↓	→	↑
	Lagging (ex post)	→	↑	↑
	Learning (monitoring)	↑	↑	→
	Input	↓	↑	→
	Output	↓	↑	↑
	Process	**n/a**	↑	→

↑ fully suitable → partially suitable ↓ not suitable

Measurement indicators

		Impact type and time horizon			
		Direct		***Indirect***	
		Short-term	*Long-term*	*Short-term*	*Long-term*
Main domains of impact	*Science*	Interaction / inspiration with non science	New / adapted research priorities / fields	Horizon expansion	Industrial and interdisciplinary spill-overs
	Economy and society	Awareness creation	Improved technological know-how	Increased productivity	Targeted R&D investments, improved competitiveness and innovativeness of countries / nations
	Policy	Application thinking	Priority setting, shaping	Increased problem awareness	Increased general satisfaction

Results and impact of national Foresight studies

Effectiveness	*Efficiency*	*Quality indicators*
• Project management procedures	• Project management & monitoring, followed up by review	• Participation rate surveys
• (Empirical) evaluation	• Personal and formal information obtained from client and stakeholders	• Share rejected participation
• International evaluation	• Assessment of change in basic research culture, without metrics	• Time needed for completion of foresight study vs. time scheduled
• indicators of impacts and participation rate	• Comparing with cost of similar projects in other countries	• Resources needed for completion of foresight study vs. resources scheduled (man days/ man months)
• Thematic panels' feed back	• Project management & monitoring, followed up by review;	• Resources needed for completion of foresight study vs. resources scheduled (financial budget)
• Accomplishment of the formally set goal in terms of specifying research areas	• Personal and formal information obtained from client and stakeholders;	
	• Comparing with cost of similar projects in other countries	

Contribution of Foresight to STI indicators

Identification of emerging areas of research

- contribution to existing statistical classifications and nomenclatures
- Identification of promising areas of innovation activities and key factors that will reflect the future role of particular research
- Systemic approach towards framework condition analysis

Global Challenges

- tools for identification of early (weak) signals of changes to become policy agenda
- new indicators to measure results of future policy making
- impact of convergent technologies on various sectors of economy
- new modes of research (like web-based labs, open innovation, etc

Industry-science linkages and multidisciplinarity of research

- contributes to deeper expert based analysis of trends and correlations within existing models
- identifying new (not necessarily directly related to STI) drivers of changes and relationships between them to be included in the models

Conclusion

- Foresight studies are becoming increasingly popular with strong impact on priority setting and policy making
- Foresight studies are considered one but still highly effective and efficient instrument to shape and design the national innovation system
- So far NIS framework conditions are rarely considered in Foresight studies
- Focus of Foresight studies increasingly shifts from pure scientific and technology trend watch towards identifying societal challenges thus combing bottom-up and top-down approach
- Multiple side effects (indirect effects) are caused by Foresight studies though these are not measurable in quantitative terms
- Further long term work is necessary to quantify and prove the impact of Foresight studies on the national innovation performance

Thank you for your attention!

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