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Design of Meta-evaluation Model for National R&D Programs in Korea

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- Background

- In-depth evaluation by NSTC +
meta-evaluation on self-evaluation by Ministries & Offices, Since 2006.
- Under the situation that nation level R&D program evaluation has not been well established yet.
- More efficient meta-evaluation methodology is needed.

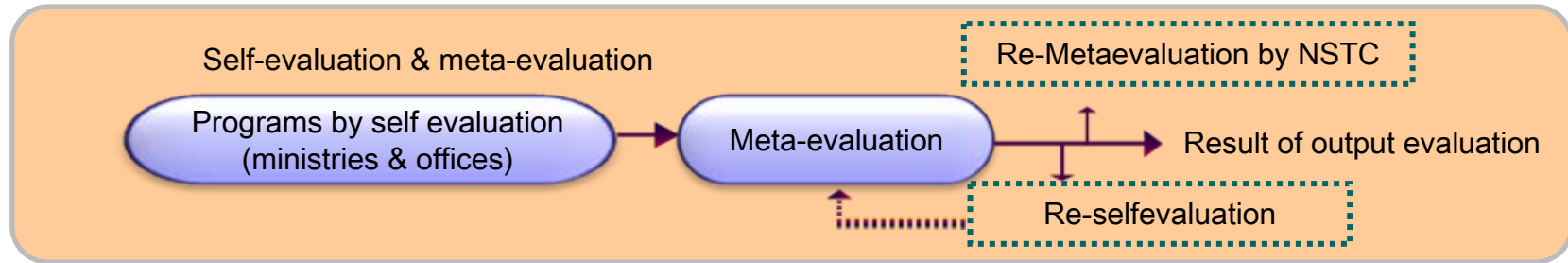
- Overview

- Some researches carried out meta-evaluation for each R&D program (Yi, 1997; Park, 2003).
- Recent research was executed for in-dept evaluation (Hong, 2006).
- This research has developed meta-evaluation model for nation level R&D programs theoretically for the first time in Korea.

- Purpose
 - To develop the meta-evaluation model and indexes on National R&D program.

- Research Scope
 - R&D program evaluation system and its characteristics in Korea
 - Literatures related to meta-evaluation model
 - Concept & major points of meta-evaluation
 - Validity of the induced indexes

- **Conceptive Diagram of Meta-evaluation for National R&D Program**



- **Characteristics of National R&D program Evaluation**

- So many programs on the national level (154 programs in 2007)
- Various contents of program (14 evaluation committees in 2007)
- Government is the main group of self-evaluation managing R&D programs.
- Steps of management, planning and implementation affect the result of R&D.

- **Consideration on Developing Meta-evaluation indexes**
 - Consideration for effectiveness vs. Evaluation cost → **core indexes**
 - Expansive evaluation for the whole related programs → **expansive indexes**
 - To Include credibility of the result of self-evaluation, as important evaluation components → **indexes on credibility of self-evaluation**
 - Consideration of given environment and review of the system of planning/implementation/management. → **excluding given environment indexes and indexes on planning etc.**
 - To reflect utilization of output to FPE (Financial Performance Evaluation) → **re-self evaluation and re-meta evaluation**

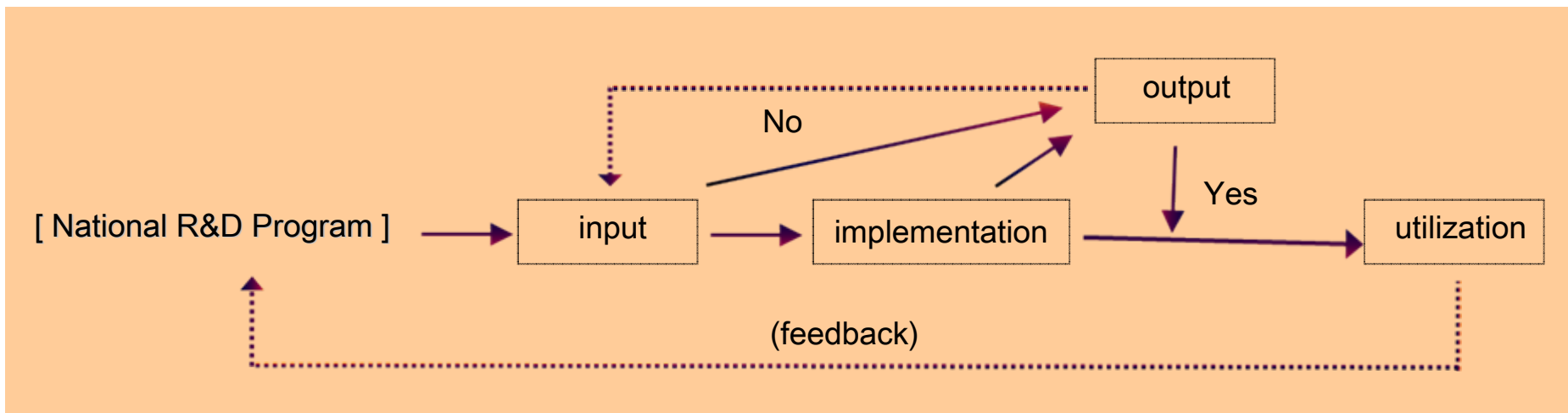
- Concept of Meta-evaluation

- Generally Meta-evaluation is defined as evaluation of evaluation.
- In this research, meta-evaluation is defined that it is a kind of work which increases efficiency of evaluation output by improving the quality of evaluation and proves propriety of self-evaluation in the view of supervisor.
- Meta-evaluation range includes not only evaluation implementation but overall evaluation system on national R&D program.

- Components of Meta-evaluation

Researchers	A	B	C	D
Larson & Berliner(1983)	input	process	outcome	
Yi Chan Goo(1997)	paradigm/resource	implementation		utilization
Hong Heung Deug(2000)	context	mechanism	outcomes	utilization
Park Jong Soo(2003)	Context/input	process	output	utilization
Hong Sung Gul(2007)	environment	input	implementation	effectiveness
Scriven(1991)	foundations . sub-evaluations . conclusions			
Joint committee(1994)	utility . feasibility . propriety . accuracy			
AEA(1995)	systematic inquire . competence . integrity/honesty . respect for people . responsibilities for general and public welfare			

- Meta-evaluation model for National R&D program
 - A circulation process of 4 steps, **evaluation input, evaluation implementation, evaluation output and evaluation utilization.**
 - * 'NO' of output means 're-selfevaluation' here.



<Figure> Meta-evaluation model for National R&D Program

- **Characteristics of this meta-evaluation model**
 - Generally, program system is understood as a circulation of input, implementation, output under the regular environment, and information about these components, i.e. feedback is required. (Chen, 2005; 5)
 - Program evaluation can be recognized as one of programs.
environment, input, implementation, output and feedback are the major components for analyzing evaluation system.
 - Beside of these components, **utilization** as a core concept of evaluation should not be excluded (Vedung 1997; 287).

- **Characteristics of this meta-evaluation model**
 - **This meta-evaluation model did not include environment component.**
because many things are difficult to be controlled in environment component such as social norm, political structure, economy etc. and even the items of environment component which are able to be evaluated, can be reflected through another evaluation component, i.e. input component.
 - Main points regarding meta-evaluation that were presented in **previous research** (refer to table) and **characteristics of national R&D program mentioned were reflected.**

- Main points of Meta-evaluation in previous research

Components	Main points	Larson & Berliner(1983)	Scriven (1991)	JC (1994)	AEA (1995)	Yi (1997)	Hong (2000)	Park (2003)	Hong (2007)
Input	object	√	√	√		√	√	√	√
	stakeholders	√	√	√	√		√		
	design	√	√	√		√		√	
	system					√		√	
	information	√	√	√	√	√	√	√	√
	evaluators	√	√	√	√	√	√	√	√
Implementation	criterion					√	√	√	√
	Methods	√				√	√	√	√
	period	√				√	√	√	√
	process		√	√	√	√		√	√
	communication	√		√	√		√		
Output	credibility	√	√	√	√		√	√	√
utilization	reports		√			√	√	√	√
	distribution			√		√	√	√	
	reflection & improvement	√	√	√	√	√	√	√	√
	Utilization system			√	√		√	√	

- Meta-evaluation indexes for National R&D Program (Proposal)

Components	Items	indexes	Main points
input	propriety of planning	4	object, stakeholders, design, system
	sufficiency of information	3	information
	propriety of Evaluators	4	evaluators
Implementation	appropriateness of method	3	standard, Method
	appropriateness of procedure	4	Period, process, communication
output	credibility of output	7	credibility
utilization	usefulness of report	3	Report, distribution
	application of output	4	reflection & improvement, Utilization system

➡ 4 components, 8 items, 32 indexes

- Measurement & Data collection

- Delphi survey:

The **importance** of evaluation components, items and indexes (removed less than 3.0) and the **weight** of evaluation items (basic & application field and development field).

* Used as standard of Likert 5 points.

- round 1: 2007. 10. 1-10, round 2: 2007. 10. 17-24, round 3: (underway)

- 24 panels

Class	Career	Position	Numbers
KISTEP	managers	researchers	3
	meta-evaluation assistant	researchers	10
Participant of meta-evaluation	meta-evaluation panel in 2007	researchers	2
	meta-evaluation panel in 2007	professors	9

- Result of Delphi Survey

R1: 4 components, 9 items, 29 indexes → R2: 4 components, 9 items, 25 indexes

Components & Items	Indexes		Weight	
	round 1	round 2	round 1	round 2
[input]	(10)	(8)	(22.83)	(21.63)
propriety of planning	3	3	8.25	7.58
sufficiency of information	4	2	6.94	6.33
propriety of Evaluators	3	3	7.65	7.70
[implementation]	(7)	(6)	(22.90)	(24.75)
appropriateness of method	3	3	12.38	13.25
Appropriateness of procedure	4	3	10.52	11.50
[output]	(5)	(5)	(32.40)	(30.42)
credibility of planning & implementation evaluation	3	2	-	15.46
credibility of performance evaluation	2	3	-	14.96
[utilization]	(7)	(6)	(21.88)	(23.21)
usefulness of report	3	3	9.46	10.06
application of output	4	3	12.42	13.15

[note] Weight was given by point of evaluation component at first, and then evaluation item point was given in that range.

- Major modifications of result of Delphi Survey

Delphi Survey	Removed evaluation indexes	Added evaluation indexes	Combined & Modified evaluation indexes
round 1	<p>is self-evaluation institutionalized?</p> <p>Are self-evaluators enough in quantity?</p>	<p>Was budget for self-evaluation sufficient?,</p> <p>Was review and utilization of self-evaluation output prepared?</p> <p>[Evaluation item] credibility of evaluation output → ‘credibility of planning & Implementation evaluation’ + ‘credibility of performance evaluation’,</p>	<p>Is self-evaluation for setting the output target appropriate? + Is self-evaluation for setting the output indexes appropriate?</p> <p>Is self-evaluation for the system of program appropriate? + Is self-evaluation for management and implementation of program appropriate?</p> <p>Is self evaluation output being distributed and reported to all of the decision makers who can use it? + Is self-evaluation output opened appropriately?</p>
round 2	<p>Was budget for self-evaluation sufficient?,</p> <p>Is evaluation period given appropriately?</p>	-	<p>Having enough available evaluation information? + Does the evaluation information Include core contents that can be used for self-evaluation?</p> <p>Is self-evaluation for setting the output target & indexes appropriate? (credibility of planning & Implementation evaluation → credibility of performance evaluation)</p>
round 3	(under way)	(under way)	(under way)

- Summary of Research

- As meta-evaluation components for national R&D program, it was separated as 4 steps of **evaluation input, evaluation implementation, evaluation output, evaluation utilization**.
- Evaluation items and indexes have been developed through literature review about main view points of meta-evaluation of previous research.
- Through 2 rounds of Delphi survey, **finally 9 evaluation items and 25 evaluation indexes** were derived as shown the table.

- Meta-evaluation indexes for National R&D Program (round 2)

Components	Items	Indexes	Mean
input (21.63)	propriety of planning (7.58)	I1: Is object of self-evaluation within basic frame of meta-evaluation?	3.8
		I2: Was there enough discussion with stakeholders when designing self-evaluation.	4.3
		I3: Is practical strategy to meet the target of self-evaluation detail?	3.9
	sufficiency of information (6.33)	I4: Does the evaluation information Include core contents that can be used for self-evaluation?	4.4
		I5: Is the evaluation information provided to self-evaluators in time?	3.3
	propriety of Evaluators (7.70)	I6: Do self-evaluators have expertise?	4.6
I7: Aren't self-evaluators related to the evaluation program?		4.3	
I8: Do persons in operation of self-evaluation have expertise?		3.8	
implementati on (24.75)	appropriateness of method (13.25)	I1: Is there evaluation standard to achieve evaluation target?	4.4
		I2: Is evaluation method in quality & quantity used appropriately?	4.1
		I3: Is proper evaluation form (external evaluation) used?	4.0
	appropriateness of procedure (11.50)	I4: Does evaluation process maintain consistently?	4.3
		I5: Was there enough education for self-evaluators to understand self-evaluation?	4.1
		I6: Was communication among stakeholders during self-evaluation process, done smoothly?	3.4

- Meta-evaluation indexes for National R&D Program (round 2)

Components	Items	Indexes	Mean
output (30.42)	credibility of planning & implementation evaluation (15.46)	O1: Is self-evaluation for the object & contents of program appropriate? O2: Is self-evaluation for the system & management of program appropriate?	4.5 3.8
	credibility of performance evaluation (14.96)	O3: Is self-evaluation for the achievement vs. target appropriate? O4: Is self-evaluation for setting the output target & indexes appropriate? O5: Is self-evaluation for the system of program appropriate?	4.3 4.0 4.6
utilization (23.21)	usefulness of report (10.06)	U1: Does self-evaluation report include information that users need? U2: Is self-evaluation report explained well enough for users to understand? U3: Is self-evaluation report being distributed and reported to users in time?	4.6 3.9 3.5
	application of output (13.15)	U4: Is evaluation output being reflected for the next year's plan of R&D program? U5: Is self evaluation output being distributed and reported to all of the decision makers who can use it? U6: Is connected system for continuous reflection of self-evaluation output appropriate?	4.6 4.1 3.8



- Future Work

- Delphi survey in this research was planned for **3 rounds** (under way). However, it will be concluded by experience that there would be no big difference at round 3.
- As future works, **standard for judging credibility of evaluation output** to re-selfevaluation and **application of meta-evaluation model** are required.
- It is expected that researches on meta-evaluation model for national R&D program will be continued and that science and technology will step forward by adopting this kind of model.

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Thank You !

