

Awareness on Open R&D of the Concerned Parties and Proposal for the Future

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1. Introduction

Open innovation refers to ‘innovation activities that maximize application of technology by speeding up the technological innovation and purposefully externalizing the internal technology by diversifying the source of innovation through active usage of outside ideas and technology.’ In other words, it is the businesses’ actions of innovation that reduce the time and cost for R&D by applying diverse outside sources of technology and not internal.

This paper attempts to 1) research and analyze the awareness of internal researchers and outside parties on open R&D and 2) suggest a desirable path for open R&D which improves productivity and collaboration among industry, university and institute.

2. Perception of concerned parties on open R&D

A survey was conducted via online and phone for 20 days on approximately 3,000 concerned people including employees of group firms, universities, private enterprises and government-funded organizations related to companies’ R&D activities. The number of total respondents was 1,014, and their composition according to occupation was as follows:

<Table 1> Composition of Respondents

Internal	Group	Public	Private	Gov.	Univ.	Total
505	204	58	165	45	36	1014
49.9%	20.1%	5.7%	16.3%	4.4%	3.6%	100%

The survey was categorized into 4 factors to measure the openness towards R&D activities – openness to manpower, openness to facilities, openness to research and openness to achievement.

<Table 2> Summary of the Responses

Category	Satisfactory	Ordinary	Insufficient
Manpower	37.7%	43.2%	19.1%
Facilities	36.4%	48.8%	14.8%
Research	36.6%	50.3%	13.1%
Performance	40.5%	48.3%	11.0%

(1) Openness to Manpower

For this category, a number of factors including hiring of outside employees, exchange cooperation and dispatch to external organizations were considered to measure the level of openness and cooperation of manpower. Only 37.7% of the respondents thought the openness level was ‘satisfactory,’ 43.2% responded ‘ordinary,’ and 19.1% said ‘insufficient.’

Hindrance to securing external manpower included lack of advertisement, hiring quota, lack of external manpower pool, static organizational culture, lack of cooperative research with outside organizations and insufficient treatment. The respondents answered that securing enough research manpower pool, extending cooperative research with outside organizations and improving the manpower exchange policies are needed for more active exchange with the outside.

(2) Openness to Facilities

Openness to facilities attempts to increase mutual applicability and promote cooperative research by sharing outside organizations’ facilities in research procedures and vice versa.

To the question asking the experience in using the facilities of the client organization, 53.4% of the respondents said they had none. Hindrance to openness to facilities included lack of disclosing of the current status, avoidance towards sharing, lack of manpower in charge and lack of facilities needed by outside organizations. Respondents answered that disclosing the information on research facilities, simplification of using process and expansion of subject research facilities are needed to facilitate higher openness to facilities.

(3) Openness to Research

Openness to research attempts to create cooperative synergy and propel more efficient R&D by sharing parts of the research projects with outside organizations in the form of agreement, cooperation and consignment and conducting research projects needed by the outside organizations by utilizing their own technology via outside projects and obtaining of services.

To the question on the extent of research openness, 36.6% of the respondents thought the openness level was 'satisfactory.' This outcome converted into a figure scale to 100 marked 57.5 points, which was slightly higher than the average, hinting a high possibility of higher openness level in the future. The biggest hindrance to research openness was lack of open information in project planning, proposal and participation (66.2%), followed by lack of participatory opportunities of outside organizations, inadequate disclosure of processes, distrust in operational capabilities, and excessive requirements in project participation respectively.

(4) Openness to Achievement

Openness to achievement attempts to restore the research achievement in the form of profit by enhancing the value of internal business through implementation or cross-application of high-level technology owned by outside organizations, and opening the possessed technology towards domestic and international organizations in the form of transfer or commercialization.

The survey outcome showed that 40.6% of the respondents thought the level of achievement openness was 'satisfactory.' The biggest hindrance to achievement openness was lack of information on the demanded technology (57.0%), followed by inadequate registration on technology information owned by outside organization, distrust in provision of proper payment, confusion in understanding the process of technology introduction, concern in losing leadership in technology, and concern in demand of excessive follow-up support respectively. Hindrance to outside transfer of possessed technology included lack of information on patent/technology, ambiguity of commercialization, inadequate commercialization policies, burden of payment on technology transfer, lack of follow-up support in transferred technology, and confusion in understanding the process of technology transfer.

3. Proposal on the Path of Desirable Open R&D

The research institute is a research organization affiliated with a public enterprise with low level of openness due to complicated share of interest and its organizational, business and technological traits. In order to accomplish sustainable development and improve the status by overcoming the limitation of possessed resource and providing the right technology to the clients at the right time, openness, communication and cooperation should be valued and further extended in not only external but in internal organizations.

<Table 3> Summary of the extent of openness, obstacles and direction of progress of each factor

Category	openness	Obstacle (1 st) Direction of progress (1 st)
Openness to manpower	56.5%	Securing high-level external manpower - Lack of hiring manpower and advertisement - Securing outside research personnel pool Opening up high-level internal manpower - Lack of manpower exchange system with the outside - Securing possessed technology and manpower pool
Openness to facilities	57.1%	Opening possessed research facilities - Inadequate disclosure of information on possessed research facilities - Extending the range of information on possessed research facilities Introducing outside research facilities - Lack of information on external research facilities - Securing external research facilities pool
Openness to research	57.5%	Participating in outside research projects - Inadequate information disclosure on project planning, proposing and participating - Extending opportunities on project planning, proposing and participating Winning project contracts from the outside - Limited range of projects for their own companies or group firms - Collecting more demand from outside organizations and their needs
Openness to performance	59.1%	Introducing technology - Lack of information on the demanded technology - Disclosing more information on the needed technology Transferring technology - Lack of information on possessed patent/technology - Disclosing more information on the possessed patent/technology

The biggest obstacle to openness in the survey turned out to be 'lack of disclosed information,' which calls for a need to reset the standards of information disclosure and change of awareness that consider technology security. I would like to suggest the following to push for more open R&D and improve achievements.

First of all, a clear understanding on open innovation is needed. It is imperative that the members know well about what open innovation is and why it is needed, and how to go through with it.

Second, policy and system-wise, the policy direction of researchers for open innovation should be included in regulations, guidelines and procedures. To this end, one should consider including the open R&D

(including internal cooperation) performance in organizational and individual evaluation indexes.

Third is about disclosing the information. The status of internal manpower, physical and technological assets and information on outside organizations should be systematically disclosed at the right time for the members.

Fourth is about measuring the open innovation achievements and compensating for performances. Achievements in open innovation should be measured and shared. Also, giving rightful compensation for high performers and organizations could boost their morale and expedite active participation of the members.

Lastly, open innovation should be a part of organizational culture. It is important that the members understand that open innovation is vital in research activities, and the performances will return to themselves and the organizations.

When openness, communication, cooperation and collaboration are made anytime anywhere within internal and external organizations, technological innovation can be made and the research development system that coexist will grow along. For open R&D to be active and stable, awareness shift and policy backup of the government and the headquarters are also vital.

When Chesbrough (2003) first came through with the idea of open innovation in "Open Innovation," he mainly focused on the R&D process. However, many researchers including him are now maintaining an integrated approach that includes IP (intellectual property) management and link to business models. Open innovation is clearly an innovative tool imperative in boosting internal capacity and improving the R&D performances.

REFERENCES

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