A Study on the Improvement of National R&D History Data Management

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Abstract—**In order to share and open national R&D information to researchers, providing user-participation service is required. With the integrated service of the National Science & Technology Information Service (NTIS), it is available to check information on R&D projects including human resources and outcomes. However, researchers are not able to see research history (research outcome) due to the possibility of the leak of personal data. Thus, this study distributed and implemented API for issuing and verifying research number (RN), which would eventually contribute to constructing national one-stop project application service and unify DB of researchers. Using the RM, it is feasible for NTIS to provide one-stop service of checking and applying for national R&D projects. Therefore, to manage the process of announcing and applying for R&D projects, this paper conducted research on examining ways to improve management of information on research history.**

Keywords-Linkage of Research History Data; Project Management System; National R&D; Project Application and Submission.

I. INTRODUCTION

The NTIS is a national R&D portal system designed to support the efficiency of R&D throughout R&D life-cycle, from R&D planning to the utilization of research outcome [1]. It has gradually evolved from 2006 (from NTIS1.0 to NTIS4.0) under the influence of external environment, changes in governmental organization, and entities of research management. By integrating with 17 national departments and agencies and constructing DB, NTIS set a goal of sharing and proliferating information on national R&D including projects, human resources, outcomes, and facilities.

As a part of 'Government 3.0 for science and technology', the purpose of this study is to construct national one-stop project application service and unify DB of researchers. Thus, we conducted research on distributing and implementing API for issuing and verifying RN. We focused on RN, as it allows researchers to use one-stop service of checking and applying for national R&D projects [2]. While [2] suggested how to provide service of integrating research history data to representative research management institutes (RRMIs), this paper expanded the subjects of the service by including research management institutes (RMIs) where there were no research management systems.

Information on participants, equipment & facilities, research outcome and collaborative research are available in the NTIS website through linkage with 17 government departments and agencies. This study was able to check

research history data in the NTIS, but the one (research outcome) linked with other researchers was not. In NTIS, a researcher can search for his or her own research history (research outcome), but cannot search for others'. Therefore, user-participating services need to be developed for the opening and sharing of national R&D information.

II. THE CURRENT STATE OF NATIONAL R&D INFORMATION MANAGEMENT

Similar to NTIS, Japan and Europe also manage national R&D information. Japan's national R&D data system is called 'Japan Science and Technology (JST)'. The projects are approved by the government or implemented by the JST internally. The national R&D data system in the EU is called Community Research and Development Information Service (CORDIS). CORDIS provides R&D and technology innovation-related data [3].

TABLE I. NATIONAL R&D DATA SYSTEMS AND DATA ITEMS

National R&D Data Systems	Data Items
NTIS	Projects, participants, research results, equipment & facilities, research outcome, science & technology statistics, etc.
JST	Science & technology report, researcher career management service, Bio information service, patent & research outcome data, etc.
CORDIS	R&D expense support, research outcome, projects, programs, R&D agencies, researchers, latest trends, etc.

Table 1 above summarizes what data items NTIS, JST, and CORIDS manage and provide.

III. IMPROVEMENT IN THE MANAGEMENT OF RESEARCH HISTORY DATA

At present, RMIs transfer information to the NTIS through information integration once an agreement for projects/programs is signed. Then, project serial numbers are given to each project or program, linking to the transferred information. Accordingly, on the NTIS website, one can search for the information on national R&D, such as participants, equipment & facilities, outcomes, or collaborative research.

In case of retrieval of information on research history of a researcher, due to the concern of leaking personal information, a researcher is allowed to access to only his or her own R&D history, implying that he or she has no authority to access to others'. However, in order to share and

publicly open national R&D information, the user-participation service is required.

Thus, this paper developed alternative solution to improve the management of information on research history by promoting NTIS to integrate with both RRMIs and RMIs so that the process of announcing, applying, and conducting national R&D projects can be managed.

A. Integrating with RRMIs with SSO

To integrate research history data, this study constructed a single channel to let the procedures of announcing, applying and modifying the R&D projects to be performed in one-stop process. For the single channel, however, a heterogeneous login solution exists, which causes the problem of multi-login when integrating NTIS with the RRMIs. Hence, single sign on (SSO) was interlocked between the NTIS and the institutes. As the resident registration number cannot be used for personal identification, by using the RN, a token is issued and verified in the SSO server.

As the result, SSO interlocking was designed to be flowed in both ways between RRMIs' research management system and NTIS. In the NTIS, furthermore, DB of announcement and application of R&D was interlocked with the RRMIs, and the systems were linked to allow researchers to be able to apply for, edit and submit a project through the single channel. It indicates that RRMIs administer and manage the procedures of applying and modifying R&D projects, whereas NTIS presents the current status of application and provides the channel ('Go To') to modify.

B. Developing Process to Integrate with RMIs

In South Korea, there are RMIs where research management systems are not used as RRMIs do. Thus, this paper constructed another single channel for RMIs to integrate research history data. Unlike the RRMIs, due to the absence of the research management systems, researchers have to send mails to RMIs when applying for R&D projects.

Thus, as shown in Figure 1, this study developed the process of applying and receiving the projects on online by using NTIS.
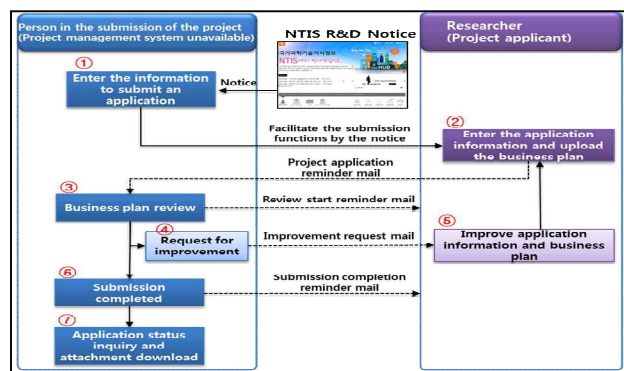

Figure 1.   NTIS Project Application-Submission Process.

The program (reception) manager selects the program announcement from the NTIS R&D announcements and inputs management information that is needed for the reception. Then, researchers upload their business plan to apply for the projects.

IV.   CONCLUSION AND FUTURE WORKS

This study examined on integration of research history data for the purpose of managing and monitoring the data. As a result, the management of ongoing projects, applied projects, researchers and participating agencies has become more convenient. Figure 2 below shows the result of this research, demonstrating the state of a researcher's participation and application project. In the table of the figure, there are names of projects, the amount of government fund, research period, and participation rate.

In sum, this paper developed one-stop project service using RN to improve the management and utilization of R&D information. The result indicates that researchers will able to check and manage such projects in 'My Project' from the NTIS.

Figure 2.   Management of My Project

However, further research is needed for NTIS to provide user-participation service to researchers. In details, to manage research history data, RN needs to perform duties of identifying individuals and managing the information linked to them. Also, more studies are needed to strengthen the security of personal information.

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