

Promote the use of public information for the knowledge service platform of LOD (Linked Open Data) linkage

Focused on ROK's Public Services Export

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Abstract— In this paper, embodied conceptual schematization for the ‘public service export platform’ building that based on ROK's public information. For a more effective use of public information, suggested by linkage of LOD (Linked Open Data). In also, before the gathering of data, for beneficiaries, requirements analysis should precede and existing data reprocessing or missing data should be re-collection. Through this process, would like to propose that it is possible to build more effective knowledge service platform.

Keywords—LOD, Knowledge Service Platform, Public Information, Public Service

I. Introduction

In recent years, private organizations and individuals, including an increase in research on public information. These are mainly on the using of public information or processing. In 2011, the EU Commission was expected economic effects of public information approximately 210 trillion, ROK was estimated at 3.5 trillion.[1]. The meaning of Public Information, Public agencies while performing the original working production & acquisition & management information that can be said.[2]. Among the these public information, the National Statistical Office (birth, death, marriage, divorce, employment, unemployment, et. al.) database and The administrations such as Seoul Metropolitan Government's municipal information(budget, policy, city planning, public transportation, et al.) are included. People can utilizing many value due to the diversity of original-information.

Thus, necessity in many aspects to public information's private utilizing research has been raising. The first, dimension from the information disclosure, 1. Increase of the national policy's transparency and information reuse. 2. Alleviate the burden of administrative duties and unified form's data, et al. The second, dimension of information literacy, 1. Creation of private sector jobs due to the business model development. 2. Provide benefits to the private sector due to the development

of related services. Based on these advantages, the major industrialized countries such as the United States (data.gov), UK (data.gov.uk), Australia (data.gov.au), expand the policy to activate & opening to the public information and related sites are actively developing in the late 2000s[3]. ROK's 'Country sharing resource portal'(www.data.go.kr) provides, 1,600 species of national statistical information, and other public information.

However before that, users should be solved in order to use these platforms. These problems, material copyright issues, as well as the opening's baseline and the limit of liability must be established. And some of the knowledge service platform, service's transmission is difficult. Because they simply shows the data and provides information passively, that service is merely to links of the relate sites. Therefore, these will be an important first assignments. For example, how to collect the information that is scattered in many public institutions. As well as how could be to unified of the data form? These problems must be resolved first, and the platform could be built to provide a broader and more high-quality knowledge services after.

The other hand, the EU and other developed countries are agenda being raised that such as expanding social welfare, desires to improve the quality of life. Naturally these countries, to the creation of a new public service utilize the existing public DB, national competitiveness is recognized. The development and export of public services from the country's industrial area is gradually being expanded. Therefore, this study will be discussed, that active public information provision ways of from the user's point, Also to linked the LOD(Linked Open Data) in terms of knowledge service platform. Specifically, we are suggest six steps from LOD linkage. a) Principles & Process b) Requirement Analysis(based on Service Design) c) Definition Data Setting d) Primary, LOD based Gathering e) Verification of Data Status (Identity the lack) f) Planning of the additional Data Gathering Method

II. Theoretical background and Previous research

A. Public Information and Public Service

What is the reason the world who wish to develop a public information? It is because the use of public information, led to the provision of public services. Public services mean, the production or supply of government services, and goods and services provided for the benefit of the communities, which these are concept that encompasses. (Sharp, 1990)[4]. Similarly, in ROK also, public services is administration, transportation, public safety, medical and related services for the public. Consumer's requirements and IT and infrastructure are expanding the target and coverage due to the advancements. Mostly ROK's industry is rely more on manufacturing business and increasing by the deficit from in the service sector. Therefore, requires the overall development of the services sector and particularly for the development of the public service sector, the development of the related platforms and services is urgently needed.

In addition, the various effects occurs in the private sector, if you can take advantage of each year the accumulative public information. For example, creating a new business model or budgeted appropriation can be reduced. You may even export to E-Government, as well as the efficiency of the administration management be improved through these Knowledge service platform. In this regard, Tim Berners-Lee (2009) [5] is based on the concept of LGD (Linked Government Data) insists on the necessity of spreading Public Information, and around the world are rushing introduction of the E-Government. The portal of online the civil petition, 'Civil Petition 24hour' (www.egov.go.kr) operates in ROK, where the cadastre, local tax payment proof, copy of resident registration, certificate of family relationship, car registration, including 5,000 species of civil petition info, 3,000 species of Internet civil petition appeals and 1,200 kinds of civil documents, regardless of time and place are provided.

B. Knowledge Service Platform

The service platform means, the application services are delivered tools or frameworks, business models, and most consists of items such as application and Web service creation and execution, and environmental management system[6]. The service export platform means, a tailored Web service export strategy and including Data Source (Knowledge DB, Stats et al.), Data Ontology, visualization, Algorithm / Simulator, Library, Profiling / Domain. Such knowledge service platform is to provide the knowledge and information you want. Also at the level of platform's self analysis & Delivery, and In terms of user the platform can be configured to provide by the delivery to use a tool. About main agent and role of the knowledge service platform for ROK's Public Services exports, Figure 1 is schematized.

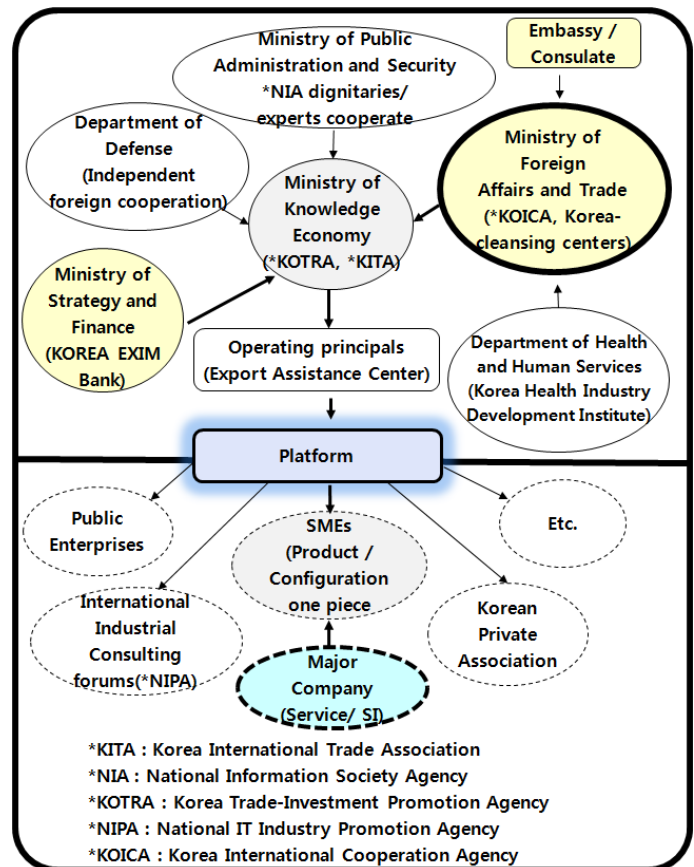


Figure 1. R&R for Public Services Platform in the ROK

C. Linked of Data

LOD means, the Semantic Web as a way to implement more specifically and RESTful protocol using the RDF format of the data at each site on the Internet that provide structured data, as well as pursuing the Data Web means[7]. Meanwhile, these Public Territory, the management system and the type of Data that is generated is difference because most of the roles and responsibilities that fixed by the laws and institutions. Each agency's data form has not been unified, so that is in order to take advantage of Public Information therefore first this standardization work should be enforced. Such work, eventually go back to the responsibility of the application developer, which means unnecessary additional development cost and effort [8]. In the new Knowledge service platform, on the other hand, the National Statistics DB and enterprise networking, such as cooperation and building requirements, ontology that interconnects through LOD can be utilized. W3C Linked Data projects, in connection with the utilization of ontology, in order the publication of ontologies and to the principles of the approach proposed and many ontologies such as FOAF, DBPedia, DBLP their interconnection is already being used[9]. As ROK's representative LOD Best Practices, 'National DB Pedia'(lod.data.go.kr) with respect to public information in 24Data sets and 50,184 Resources are provided[10].

III. LOD Development Process in the Knowledge Service Platform

A. Knowledge Service Platform

Knowledge service platform to create new value through linking different areas of expertise, these services will be built and operated like Figure 2. Therefore, the knowledge DB and Library building is essential for in order to provide an ontology-based service. The old portal's all data has created by greater burden of time and cost. But if you take advantage of LOD, through linkages with existing DB can reduce the time and cost, as well as gradually to expand search of the data being transferred, with open to Information the institutions will be increased, and based on the LOD like stakeholder net in that the requested service will be made an excellence environment.

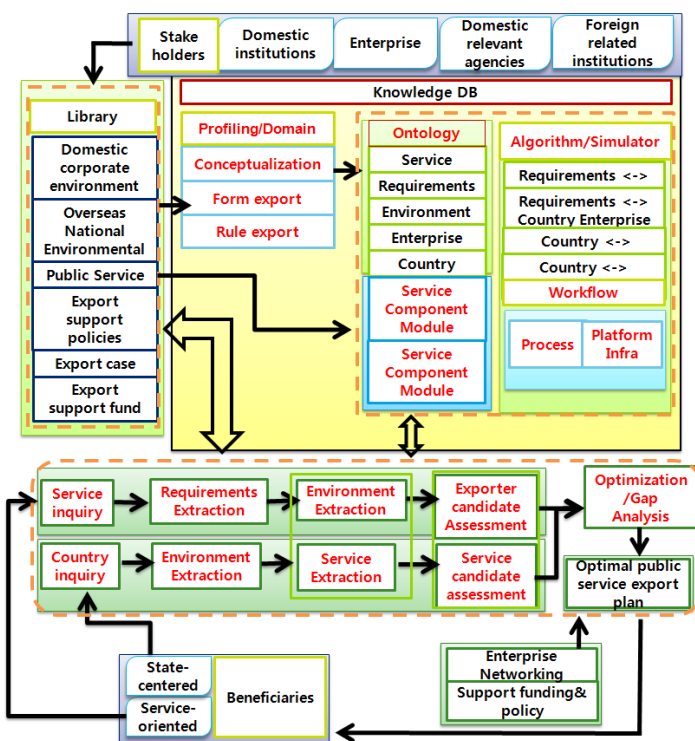


Figure 2. Public Services are Expected Export Platform

B. Data

- Principles & Process

Typically, fundamental data flow and procedures are required, for the to implement LOD. W3C, following The Linked Data Principles are presented[11]. 1.Use URIs as names for things. 2.Use HTTP URIs so that people can look up those names. 3.When someone looks up a URI, provide useful RDF information. 4.Include RDF statements that link to other URIs so that they can discover related things. Given this, in the public service export platform as Figure 3 principle applies.

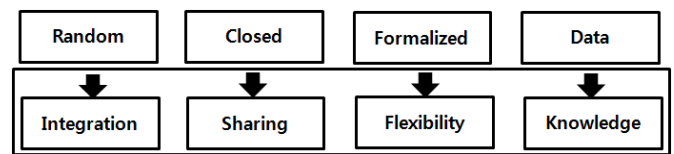


Figure 3. Data principles to be applied to the platform

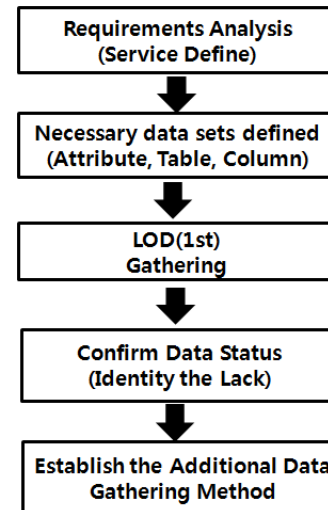


Figure 4. Process data in accordance with the principles of the platform

- Requirement Analysis(based on Service Design)

Extensivity of the data that is retrieved through the LOD, so public services export platform is you need to define more that compressed as data with range and properties. This service beneficiaries' requirements analysis then reflect as the platform, it is possible. So there are several ways how they can be applied in this case, these are FGI(Focus Group Interview), surveys, individual interviews and so on. The most important thing is to solve the problem related and provide the necessary data from the perspective of corporate like beneficiaries substantially. For instance, first analyzes the possibility of donor funding and national issues (such as war, disaster, public safety, et al..) and can be drawn from the list of candidate services. Subsequently, make portfolio through a matrix configuration and thereby support decision making and to create a procedure that experts in the field to advise.

- Define Data Set

ROK's ODA bidding list consist of as next items. 'High Rank' : Bidding in progress, Bidding nomination (private contract), My bidding status, My status notification, My tryout, My auction results, Bid results / 'Low Rank' : Selection, public announcement number, My bid breakdown. public announcement Date, Application deadline, Contract method, Progress, Register, Announcement No. / 'Subsection' : Overview of Bidding, Correction announcement, Conditions of Contract, Bidding proceeds order, Announcements General / 'More Details' :

Bidding numbers, Announcement Date, Bidding Subject, Service range, Contract method, Sold methods, Whether to supply obligations, Bid deposit payment for, Bidding eligibility, Whether international bidding, Bid presentation place, Correction Announcement reasons, Liquidated Damages, Flaw Performance Bond, Contract deposit, Bid statement times pause, Application Form - Submission Period, Bid submission period, Wicket pause, and so on.(KOICA EBID)[12]. So, on these a lot bidding list's Countries and Public sector that if categorize according by segmentation with the results of the analysis of the requirements, that can be easier and faster for them to choose the information they need.

- 1st LOD based Gathering

Services through a needs analysis to be done, Made the final dataset again through it that Since, current linked data will perform the procedure that in order to secure real. This includes the contents of the selected DB schema analysis, ontology development (schema design), the URI naming, RDF triple conversion and implementation of the data on the basis of the RDF, RDF standardized 'Ontology / Vocabulary' to comply shall[13].

- Confirm Data Status(Missing Check)

First, need data collected depending on the requirements then have to required to find information that is not secured through the LOD's linking. These procedures are among the many elements that comprise a knowledge service platform, the target library and knowledge DB, an ontology-based decision support structure or proposed structure of the necessary information and enforcement appointed design. Accordingly, have to determine whether missing information is necessary antecedent .

- Establish additional Data Gathering Methods

It must be basically responsible for the operating platform of the 'Public Services Export Assistance Center', and conducted by the user feedback to improve the quality of the data. Links and server errors, the errors of the original information et al. is continuously modified. If Nevertheless the missing data is found, must receive permission from the agency, which is expected to keep this information open. At this time, you ensure proper cooperation with the appropriate agencies, or lack of information, promoting the re-structuring of the existing data and can increase utilization.

C. Expected Outcomes

To the final calculated results, Service aspects and managerial aspects of Public Services Export Platform, the functions are separated. Services in terms of public agencies, public corporations, and other large enterprises is registered as a service provider. Service users, large corporations, small businesses, and private associations and individuals, and so on depending on Managerial aspect, with respect to the platform operating can look directly Management (Export Assistance Center opened) and indirect management(Public information governance building).

| Existing Approach of LOD | | Proposed Approach for Knowledge Service Platform of LOD | |
|------------------------------|--------------------------------|---|----------------------------|
| Association DB 1,2 | Around Keywords Retrieval | Requirement Analysis | Association DB 1 |
| Around Keywords Retrieval | Explore Meaningful | | Association DB 2 |
| Explore Meaningful | Core Data Acquisition | Association DB 1 | Core keywords Retrieval |
| | Peripheral Data Acquisition | Association DB 2 | |
| | | Core keywords Retrieval | Core Data Acquisition |

Table I. Concept provides a way of hanged data

D. Conclusion

In summary, if based on the LOD's Knowledge Service Platform, which had great significance in terms that can be utilized effectively than the existing DB's passive and widespread. New information providers will be involved based on the new platform, depending on the advantage of being able to access the data they already collected. In addition, prohibit generating indiscriminate of data that in order to avoid duplicate investment and build the data and reduction of storage costs, and come into being as new business models that take advantage of the public information. Besides, is expected to increase the accessibility of the data, as well as ease of data management(the using of a standardized form) and so on.

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