

# Business Models and Governance Strategy of Policy Knowledge Service for National Knowledge Management

Kyoung Jun Lee

School of Business, Kyung Hee University  
Hoegi-Dong, Dongdaemun-Ku, Seoul, Korea  
klee@khu.ac.kr

**Abstract.** A national knowledge management system consists of internal knowledge management systems of governmental agencies and various knowledge services playing a role of intermediary, catalyst, and network. A policy knowledge service plays the roles of abstracting, codifying, and diffusing knowledge in public sector. Through abstraction and codification, it maximizes the proprietary value of knowledge. Through the diffusion of knowledge in proprietary form into public sphere, it maximizes the shared value of knowledge. In this paper, the business model and governance strategy of policy knowledge services are discussed through theoretical understanding and practical experience of operating Korea's Knowledge Center for Public Administration and Policy. Three dimensions of policy knowledge services and two hypotheses on the governance of policy knowledge services are suggested.

## 1 Introduction

As the complexity of public management and policy making environment continues to increase, the importance of systematic support of decision making process is continually increasing. On the other hand, knowledge becomes one of critical components in decision making of modern society, creation of value, and institutional change. Therefore, the problem of creating and managing the knowledge systematically becomes the core issue of modern organizations.

However, knowledge environment supporting the policy making has been poor. Most of governmental organizations have not yet set up knowledge management system. Though there have been some efforts for integrating knowledge management systems, they are not successful. The knowledge and information for policymaking still depends on the limited knowledge, data, human network of individual public officers. Such problem is more severe in local governments, but central government also suffers from the same problem.

In the mean time, as digital networks are diffused, the size of digital content industry and the services supplying high-level knowledge for private and public sectors radically increase. However, their business models are not soundly established and the mechanism of cooperation and governance between the businesses and governments has not been settled.

This paper deals with the issue, that is, what are the desirable business models and governance mechanism of policy knowledge service. Building national knowledge-

management system cannot be successful only with government's efforts. For its success, the role of policy knowledge services is important because they act as catalyst and intermediary of knowledge creation and sharing. Since the policy knowledge services exist external to government organizations, the government should have a sort of governance [6, 11, 13, 14] mechanism with them. With this premise, this paper applies knowledge theory and the concept of business model to policy knowledge service for building up the basis of analyzing the role and its direction of policy knowledge services.

First, we discuss policy knowledge service based on the recent knowledge theory such as I-space [2] and the reversed hierarchy of data-information-knowledge [16].

Second, we introduce the concept of business model as the framework to define and classify policy knowledge services since a policy knowledge service is a business whether its entity is private or public.

Third, based on the theoretical understanding of policy knowledge service and the experience of operating a policy knowledge service, KP&P (Knowledge Center for Public Administration & Policy), we propose some hypotheses for building and governing policy knowledge service from national knowledge management perspective.

## 2 Characterizing a Policy Knowledge Service

The development of digital network is generally claimed to advance the speed of knowledge diffusion. However, this claim needs to be analyzed more precisely. Knowledge is owned by an individual and is not easy to be observed by a third entity. If knowledge is something that cannot be diffused easily, the term 'knowledge service' might not be appropriate since the knowledge cannot be easily served. As the expression 'Who knows it?' is more natural than 'Where is the knowledge', knowledge is linked tightly to its agent [3]. Therefore, it can be claimed that though digital networking has increased the speed and amount of data and information diffusion, the speed of knowledge diffusion might not be much changed since some knowledge cannot be easily separated from its agent. However, the 'death of distance' from digital networking is a reality in some domains. This implies that the speed and amount of knowledge diffusion is dependent on the characteristics of knowledge.

### 2.1 Policy Knowledge Service from Tuomi's Reversed Hierarchy

For deeper understanding on knowledge characteristics and characterizing a policy knowledge service from the understanding, we first introduce Tuomi [15]'s new conceptual hierarchy on data, information, and knowledge, asserting that data emerges from information and that information emerges from knowledge. This claim seems to be against the existing explanation that data is simple facts and they become information when combined into a meaningful structure and the information become knowledge when it is embedded into a context. According to the traditional perspective, data is the precondition of information and the information is the precondition of knowledge.

Tuomi's reversed hierarchy gives a new paradigm that leads us to a different approach in developing information systems for supporting knowledge management and

organizational memory. However, Tuomi's claim complements the existing explanation rather than ignoring it. It is certain that a data clearly depends on a knowledge that produces the data. A data  $D_A$  can emerge when a knowledge  $K_A$  is assumed and the sender and the receiver of  $D_A$  should share the knowledge  $K_A$  for their communication of  $D_A$ . The new claim that generating a data should be based on some knowledge cannot deny the existing claim that a new knowledge is generated from a data. For example, from a customer's purchase data we can get some knowledge on the customer's purchase behavior. In other words, if we analyze the data  $D_{A1}$ ,  $D_{A2}$ ,  $D_{A3}$  assuming a knowledge  $K_A$ , then we can get a new knowledge  $K_B$ .

Tuomi's claim throws and answers questions such as "How is a 'knowledge' service different from 'information' service or 'data' service?" and "What unique functions does a 'knowledge' service perform?" If we apply the Tuomi's claim rigorously, then knowledge cannot be serviced since knowledge cannot be separated from its agent. If knowledge cannot be separate from its agent, then the knowledge service should serve the agent, a human or an information system that processes data and information with the knowledge. The degree of knowledge separability determines the basic two knowledge management strategies: codification and personalization [5]. Codification strategy is used for the knowledge separable and personalization strategy is adopted to knowledge inseparable. Kankanhalli et al. [7] suggest two-by-two contingency for adopting the knowledge management strategy using two dimensions: 1) produce-based vs. service-based organization and 2) volatility of environment. The volatility means the rapidity of change in the business environment and thus the extent to which knowledge can be economically reused. According to the contingency, some domains such as product-based organizations in a high-volatility context should mix the codification and personalization strategy. On the other hand, a government agency, basically a service-based organization, can choose an extreme strategy depending on the volatility of the domain. In high-volatile policy domain such as central government policy makers, we should use personalization approach. On the other hand, for the low-volatile public domain such as local government administration officers, we can adopt codification approach.

On the other hand, we need to answer the question 'why the clients demand the knowledge service?' Clients need knowledge for solving a problem or making a decision. There is no data without assumed knowledge and there is no knowledge without presumed problem solving or decision making. Therefore, knowledge is connected to a decision making problem. A knowledge service is a service for solving a problem and a data service assumes a same level of knowledge shared between the service provider and the client. The important characteristic of knowledge service different from that of data service is the level of knowledge. A data service assumes the same level of knowledge between the provider and the recipient, but knowledge service assumes the different knowledge level between the provider and the client. The difference between knowledge service and data service is on the existence of difference in interpreting what is provided. While a data service assumes no difference of interpretation between provider and recipient, a knowledge service assumes the variety of interpretation between provider and recipient.

### 2.2 Policy Knowledge Service from Boisot’s I-Space

For more advances in approach to characterizing a policy knowledge service, we introduce Boisot [2]’s I-space framework introducing the concepts such as abstraction, codification, and diffusion of information. According to Boisot [2], knowledge is classified into ‘concrete’ and ‘abstract’, ‘uncodified’ and ‘codified’, and ‘undiffused’ and ‘diffused’. A piece of knowledge which is concrete, uncodified, and undiffused, is more and more abstracted, codified, and diffused. During the process ‘personal knowledge’ becomes ‘proprietary knowledge’, and through ‘textbook knowledge’ into ‘commonsense knowledge’. Boisot, using the I-space, explains the dilemma of knowledge creators. The value of knowledge is maximized to the knowledge creators when it is abstract, codified, and undiffused. On the contrary, the most valueless knowledge is concrete, uncodified, and public knowledge.

Using the I-space concept, we can characterize a knowledge service. A knowledge service abstracts, codifies, and diffuses knowledge. Through abstraction and codification it maximizes the value of knowledge, and through the diffusion of knowledge in proprietary form into public sphere it makes high the utilization of knowledge. The roles of policy knowledge service can be classified into the two ones.

A policy knowledge service contributes to moving knowledge in ‘A’ location to ‘B’ in Figure 1. It maximizes the proprietary value of knowledge by abstracting and codifying a data and information into a generalized and documented knowledge.

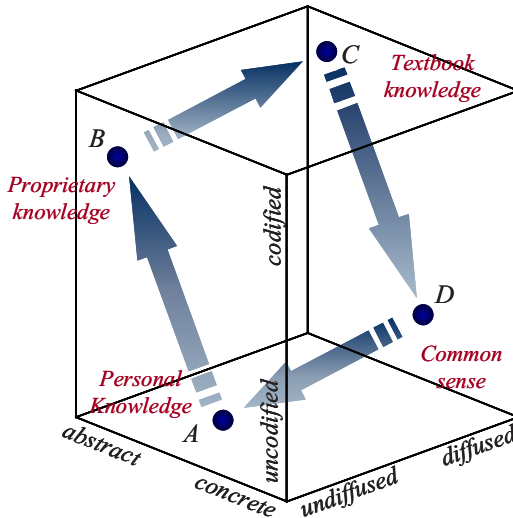


Fig. 1. Move of knowledge in I-Space [2]

The other policy knowledge service contributes to moving knowledge in ‘B’ location to ‘C’ in Figure 1. It diffuses the value-maximized propriety knowledge into society so that public can get benefits from its usefulness. The first service has the role of maximizing the proprietary value of knowledge and the second has the role of maximizing the shared value of knowledge. Both roles are important and a policy knowledge service organization can play either or both roles.

Summarizing the above discussions, we define and characterize a policy knowledge service as follows:

1. A policy knowledge service is differentiated from other policy data or information services in that it assumes the different knowledge level between the service provider and the client and the potential variety of interpretation between the two.
2. A policy knowledge service basically has two kinds of knowledge service strategies, codification and personalization, depending on the degree of separability of knowledge in a policy domain.
3. A policy knowledge service has two roles. The first role is maximizing the proprietary value of policy knowledge through abstraction and codification of knowledge in the domain. The second role is maximizing the shared value of policy knowledge through its diffusion.

### 3 Business Models of Policy Knowledge Service

A policy knowledge service is a business whether its entity is private or public. To successfully sustain as a business, a policy knowledge service should develop a good business model. An initiator of policy-making knowledge service should analyze its business from a business model perspective.

Business model is a description on the way of activities of a profit or nonprofit organization to develop and sustain its business. Since the year 1998, there have been many efforts to define and analyze the business model especially in e-commerce and e-business domain as well as e-government domain [8]. Timmers [14] defines a business model as: 1) an architecture for product, service and information flow, with a description of the various business actors and their roles; 2) a description of the potential benefits for the various business actors; and 3) a description of the sources of revenues. Mahadevan [9] suggests the three business model building blocks such as value streams, revenue streams and logistical streams, and claims that a business model is a unique blend of the three. Amit and Zott [1] define a business model as the design of transaction content, structure, and governance to create value through the exploitation of business opportunities.

Different from the definitions of [1], [9], and [14], those of [4] and [11] include the concepts of customer and the market. Rayport and Jaworski [11] define a business model as the four choices on (1) a value proposition or a value cluster for targeted customers, (2) a marketplace offering – which could be products, services, information or all three, (3) a unique, defendable resource system, and (4) a financial model. From a technology management perspective, Chesbrough and Rosenbloom [4] state that a business model is composed of 1) value proposition, 2) market segment, 3) value chain structure, 4) cost structure and profit potential, 5) value network positioning, 6) competitive strategy.

Summing up the above definitions, we give an comprehensive definition of business model. A business model is a description of following components and each of them should be determined contingently considering technological change, institutional change, competitive environment, and macro-economic environment.

1) Value Model (Value proposition and marketplace offering): The value and its realization such as product, service, and information etc. proposed to business participants including customers by the business initiator.

2) Customer Model (Target customers and market segmentation): The customer groups and their segmentation who enjoy the ultimate value.

3) Activity Model (Positioning in the industry and activity configuration): The scope of business activities of the business initiator and its activity configuration within the scope.

4) Financial Model (Cost structure and profit model): The time and monetary cost to initiate and sustain the business and the revenue and profit estimated.

Using the definition of business model, we analyze the policy knowledge service. The value proposition and marketplace offering of a policy knowledge service include a solution to a policy problem, knowledge support for a policy decision making (policy theory and practices, and legal information), policy expert network, and policy community and forum etc.

A policy knowledge service cannot serve all kinds of customers, so policy knowledge services can be classified depending on their target customers. For example, national research institutes of specific policy domains define the target customers as the public officers on the policy area and some research institutes provide knowledge service for local governments.

The third component of a policy knowledge service, activity model, includes the choice between 'demand-driven' or 'supply-driven' service. This classification is similar to the choice of manufacturing value chain between 'make-to-order' and 'make-to-stock'.

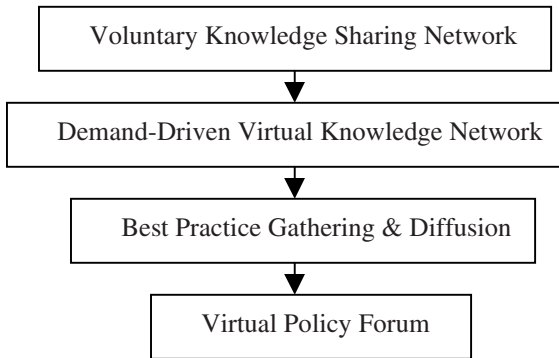
The core of financial model of a policy knowledge service is its ownership, government support, and revenue model.

## 4 A Case Study: Business Model Evolution of KP&P

Knowledge Center for Public Administration & Policy ([www.know.or.kr](http://www.know.or.kr)) established in 2001 is a government-supported organization located at a national university of Korea. With the mission of supporting effective public decision making and promoting informatization of the public knowledge management, the center has a vision of systematically collecting, analyzing, managing, and disseminating the information and knowledge produced in the various communities of public sector. However, the business model of KP&P has been evolved through trial and errors as Figure 2.

The center started as a voluntary knowledge sharing network for public sectors. To promote the voluntary knowledge sharing between members, the center decided to first accumulate about thousands of policy knowledge items gathered from other open Web sites into its knowledge base. However, the quality of knowledge was not satisfactory because the average cost per a knowledge item was ten dollars. The steering committee of the center judged that the low quality knowledge items would not satisfy public officers and decided to defer the official service opening of the knowledge base. The voluntary knowledge sharing was also not active than expected, the center modified its business model from the knowledge sharing network to knowledge provider. Therefore, the center temporarily determined its business model as a demand-driven virtual knowledge network and had interviews with its potential customers

(public officers) for gathering opinions on its business model. The result of the interview made the center change its business model again. The demand-driven virtual knowledge network model assumed providing knowledge rapidly by itself or by cooperating with other knowledge suppliers when a public officer notifies its service request to the center. Public officers doubted the capability and the agility of the center which has a small government-supported budget. In addition, the center doubted its potential demand since such a business model has been adopted by various research institutes and consulting companies.



**Fig. 2.** Business Model Evolution of KP&P

The interview with officers guided the selection of knowledge types that the center should focus on. Initially the knowledge sharing Web site of the center has a knowledge map covering 40 knowledge types and 400 policy areas. However, among the various types of knowledge, the officers had the information needs only on a few areas such as best practices, expert information, legal information, knowledge-on-demand, and policy rationale etc. The scope of five knowledge types is still too wide for the center with a limited budget to maintain high-level quality on.

The center finally decided to focus on the best practices among the five knowledge categories. This is a decision on the value proposition and marketspace offering of the center, the first component of its business model. Now the business model of KP&P became the ‘Best Practice Gathering & Diffusion’. For its activity configuration, the third component of its business model, the center decided to gather, evaluate and rework the existing best practices rather than create them. The target customers, the second component of its business model, were determined as the local government officers rather than central government officers because local government officers had suffered much more than central officers from the so called knowledge gap. Although the center has been and would be financially supported (\$400,000 per year) by government for four years since the year 2001, it should develop its own profit model to sustain itself after the year 2005.

Based on the ‘Best Practice Gathering & Diffusion’ business model, the center has accumulated and diffused best practices through the programs such as Local Government Best Practice Competition, Best Local Government Officer Case Studies, Public Sector Reform Cases, and Best Practices of Leading Local Governments. On the other hand, in the summer of the year 2003, KP&P launched a new service ‘virtual policy



forum'. It opens eight policy forums on the central policy areas such as e-government forum, public sector reform forum, balanced regional development forum, health and medical policy forum, information and telecommunication policy forum, and human resource policy forum etc. For a half year, the center held more than fifty virtual policy forums. Each forum has one or two presenters and four to six commentators on the main presentations. The center with the new service changed its target customers from local government officers to central government officers, legislators, and policy experts. The center sends the forum information by email to their members. This new business model gives an interesting implication that the center evolved its knowledge service strategy from codification (i.e. best practice diffusion) to personalization (i.e. virtual forum).

As seen in the above, the business model of KP&P has been being evolved continuously and the evolution itself can be a right strategy rather than a trial-and-error. Since the adaptation and the evolution of business model demands flexible online information system to KP&P, the center develops and maintains knowledge management systems with an emphasis on flexible service offering and management.

## 5 Governance Strategy of Policy Knowledge Service

The theoretical investigation and practical experience of operating KP&P give some insights to governing policy knowledge service from national knowledge management perspective. It is an important for a nation to design and improve its national knowledge management system for supporting its policy decision making. One of core issues of national knowledge management system is governance problem such as whether to privatize a policy knowledge services or not, what to privatize, how to network policy knowledge services with internal knowledge management systems of government agencies. Summing up the above discussions, we suggest three dimensions to guide the governance strategy of policy knowledge services: 1) Proprietary Value Maximizing vs. Public Value Maximizing, 2) Supply-driven vs. Demand-driven, and 3) Private-owned vs. Government-supported.

The two hypotheses we propose are as follows:

1. The proprietary value maximizing function of policy knowledge service should be demand-driven and privatized
2. The shared value maximizing function of policy knowledge service should be supply-driven and fully supported by government

These principles, however, have not been well implemented in real world. Many current policy knowledge services seem to have ambiguous business models mixed with the proprietary value maximizing function and the shared value maximizing function. The main tasks of most national research institutes are providing demand-driven knowledge services requested by the upper-level ministries. Sometimes they perform the consulting work requested even by private companies. The knowledge created in such environment is shallow and short-lived knowledge. Such knowledge cannot be diffused to other domains and its public value is low. This kind of knowledge service needs not to be done by government-supported organization. The government-supported knowledge service entities should devote their efforts to make long-term nation-wide competitive knowledge and diffuse the proprietary knowledge



to public rather than to provide the short-term knowledge demanded by daily policy making.

A 'supply-driven' knowledge service should be supported by government. For example, best practice based policy knowledge service should be fully supported by government and supply-driven so that best practices could be diffused rapidly to other governments without much concern on its intellectual property. In the U.K., the domain of good practice database service was changed from ORG (Goodpractice.org.uk) to GOV (benchmarking.gov.uk).

## 6 Conclusions

In this paper, we propose policy knowledge service elements and their composition and governance for building a national knowledge management. Based on the theoretical understanding and practical experience, we suggest a hypothesis claiming that the proprietary value maximizing function of policy knowledge service should be demand-driven and privatized while the shared value maximizing function of policy knowledge service should be supply-driven and fully supported by government. In addition, a policy knowledge service should choose an appropriate knowledge service strategy between codification and personalization according to the characteristics of the policy domain. Applying these principles we propose following practical guidelines.

1. Best practice-based knowledge service, such as the 'best practice gathering & diffusion' business model of KP&P, based on codification strategy for local government administration should be supply-driven and supported by government
2. Virtual policy forum service, such as the 'virtual policy forum' business model of KP&P, and policy expert directory based on personalization strategy for central government policy making should be supply-driven and supported by government.
3. Demand-driven and personalization-based policy knowledge service such as special-purpose benchmarking and consulting should be privatized rather than supported by government.
4. Demand-driven and codification-based policy knowledge service, if any, should be privatized.

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