

The Research on the Policy Information System: A Case Study of National Health Insurance Policy in Taiwan

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Abstract

A wrong policy is far worse than corruption. It goes without saying that making good policies has its substantial importance and influence. It is assumed that policy information systems can benefit policy making and enhance the possibility of good policies. Therefore, the research focuses on the discussion of policy information systems, and tries to build up one policy information system for Taiwan's National Health Insurance. The paper discusses significant components of a good policy information system, and illustrates the process of systematically collecting, building, and saving information related to Taiwan's National Health Insurance policy. Overall, the main contribution of the research is to construct a policy information system, which has not been widely or frequently used in the public sectors. It is expected that this study can complement application and research related to policy information systems in government at all levels and across all branches. Furthermore, for the academicians as well as practitioners, the study can also promote the comprehension of policy information systems.

1. Introduction

As democracy has been widely promoted in most governments, the principles of accountability, responsibility, representativeness and legitimacy have been placed substantial attention. The transparency of administrative decision-making processes and the activities about information disclosure from governments to the general public were regarded as significant approaches to achieve above principles of democracy, especially accountability and responsibility. In addition to the consideration of democracy, knowledge management as a new management concept and technique has also attracted more and more attention recently. Knowledge somehow has replaced capital or labor and become the

best and newest asset, intellectual capital, or wealth in organizations (Stewart, 1998; Teece, 1998; Petrash, 1996). In terms of knowledge, it is usually transformed from information, and information is transformed from raw data. In this sense, policy information systems are constructed to collect and store raw data, and, with systematic analyses or calculations, raw data will become information and then useful knowledge. The primary activities involved in knowledge management include knowledge sharing, knowledge accumulating, and knowledge creating. These three activities tend to be a cyclic process. With knowledge sharing, knowledge can be accumulated, and, based upon a great amount of knowledge, new knowledge can be easily analyzed, created and shared again. Policy information systems are expected to provide the functions of knowledge sharing, accumulating, and creating, and, therefore, help policy problem identifying, policy planning, policy legitimation, policy implementation, and policy evaluation. To sum up, policy information systems are designed to meet the objectives of democracy in terms of the disclosure of decision making processes and related information. Additionally, policy information systems are applied to achieve the practices of knowledge management because of the functions of knowledge sharing, accumulation, and creating. In reality policy information systems were not popularly employed in the public sectors as those in the private sectors. Generally speaking, the application of policy information systems in the public sectors learns from private-sector experience, but should be trimmed to fit public-sector needs.

This paper, therefore, discusses the meaning and content of policy information systems, and then tries to articulate the benefits and costs of them. Furthermore, the policy information system of Taiwan's National Health Insurance (NHI) will be built up to see the framework, components, and implementing procedures of a policy information system. This paper concludes with some suggestions to useful and helpful policy information systems.

2. Policy Information System

As mentioned above, the term or the concept of policy information system is quite new and somewhat related to the development of decision support systems. The decision support systems have been applied in commercial or non-commercial decision making for about two decades, but have had no unanimous definition so far. The explanation was attributed to cognitive differences among different users and, given fast development of information technology, different meaning and functions embedded in decision support systems. Morton and Scott (1980) defined that decision support systems are computer-based systems used to deal with semi-structured problems; Holesapple and Whinston (1996) defined decision support systems as useful tools to clarify or solve problems and to provide interaction for decision makers. The emergence of policy information systems was viewed as a branch of decision support systems. Following the definition of decision support systems, the policy information system can be defined as *a computer-based information system used to clarify the contents, components, and procedures of a policy, and provide some alternatives for an undecided policy.* According to Turban's (1992) statements, a policy information system was expected to possess some characteristics as follows:

- (1) A policy information system is consisted with data and their relevance;
- (2) A policy information system helps to clarify stakeholders, components, and procedures of a policy.
- (3) A policy information system should be used to support policy makers, but not replace policy makers.
- (4) A policy information system is adopted to improve the effectiveness and accuracy of a policy.

Under the US Data Automation Programs, the Trade Policy Information System (TPIS) was designed and operated, which primarily stored past and current information of international trade. Specifically, the information set includes statistics and indicators of US's as well as the other 170 countries' commercial trade, international finance, trade direction, payment balance, and grants to developing countries offered by the International Monetary Fund and World Bank. The Trade Policy Information System was claimed to have four characteristics:

(<http://www.ita.doc.gov/td/industry/otea/tpis/>)

- (1) Enables comprehensive trade policy analysis for decision makers.
- (2) Assures that data used are timely.

- (3) Makes data consistently available with consistent values throughout the United States Government trade community.

- (4) Provides a processing faculty equally important as the data, equipped with special tools for analysis and customized reports.

The primary users of the Trade Policy Information System are US federal government and agencies. TPIS is used for:

- (1) Trade policy development; for example, identifying unusual trade patterns indicating trade barriers.
- (2) Trade policy implementation - developing tariff line item retaliation lists, monitoring textile/apparel and other import quota/restraints.
- (3) Trade district analysis.
- (4) Publishing reports which contain data on U.S. exports and imports by product group and trading partner.
- (5) Export promotion planning: analysis of U.S. export capabilities and global competition.

In addition to the Trade Policy Information System, the Science and Technology and Innovation Systems Policy Information Map (STIMAP) was also used to policy studies of science, technology and international, national, and regional innovation systems. It was built up by MatrixLinks and IFIAS on July 31, 1995 to provide policy documents as well as lately research results for governments, science and technology policy committees, research institutions, science and technology related entrepreneurial organizations, and international science systems (<http://stimap.matrixlinks.ca/>). Besides, the US Global Change Research Plan set up the Global Change Data and Information System (GCDIS) to provide scientists, researchers, policy makers, educators, entrepreneur owners, and the general public with global change data and information (<http://globalchange.gov/>).

In summary, the features and contents of above policy information systems manifested the functions and advantages of policy information systems. Explicitly, a good policy information system can supply timely, consistent information as well as professional policy analysis for policy makers in the public or private sectors. Since policy information systems can store a great amount of information, and divide information into appropriate categories, they provide policy makers with specific and useful information. With the aid of each policy information system, a policy maker can, therefore, make policies with some extent of rationality, based upon current and previous information, policies, and experience. In terms of the software selection for policy information systems, the software of MapInfo and ArcView might be used to construct policy information systems, since they can be combined with the geographic information system (GIS) for multi-functional uses and purposes.

3. Benefits and Costs of Policy Information Systems

Accordingly, the benefits and costs of policy information systems can be summarized. In terms of their benefits, first, since policy information systems are computer-based systems, they can store a great amount of data and information and provide past and current information instantly (if it is frequently updated). Second, with the aid of policy information systems, policy makers can comprehend the components and procedures of policies in a short time period. Third, if policy information systems are adequately designed, policy makers can identify policy stakeholders by looking at the interpersonal network among different components. Fourth, like what provided by decision support systems, policy information systems are assumed and expected to improve the effectiveness and accuracy of policies.

The costs of policy information systems are mostly invested on the equipment where policy information systems are built, and the working hours or salary of the staff who take the responsibilities to update the information as well as maintain the systems.

While, if intangible benefits or positive externalities of policy information systems are taken into account, policy information systems can be a policy instrument used to carry out a government's accountability and responsibility to the general public, and a feedback mechanism to absorb public opinions. Therefore, it is believed that the benefits of policy information systems outweigh their costs most time.

4. Application: The Construction of the Policy Information System for Taiwan's National Health Insurance Policy

Based on the concepts mentioned above, the research tries to build up a policy information system for Taiwan's National Health Insurance (NHI hereafter). Before getting into the details of the policy information system, the background of NHI should be addressed. In February, 1986, Premier Yu Kuo-Hua made an important announcement in the Legislative Yuan, who declared that the government will realize national health program by the year 2000. Following the announcement, the Executive Yuan instructed the Council for Economic announcement, the Executive Yuan instructed the Council for Economic Planning and Development in July 1988, to organize a task force to study the policy. As the ambitious policy was new to Taiwan, several domestic and foreign scholars were invited to conduct the study. By July 1994, the task

force drafted "National Health Insurance Bill," and was presented to the Legislative Yuan for debate, which approved the policy a year later. The president soon signed the bill to become law. In March 1995, the NHI Program was implemented to make health and medical care available to all citizens. The ten years between 1986 and 1995 were the critical years that Taiwan transformed from an authoritarian regime to a democratic system. To cope with new challenges from an open society, the ruling clique learned to compromise with outside forces, including the long suppressed legislative system, native forces, business, opinion group, and even technocrats, which promoted those groups to an unprecedented importance. NHI was regarded by many as Taiwan's most important policy on people's life in the past forty years. It relates to a wide range of social activities, and the amount of money involved has been astoundingly high.

With respect to the policy process, NHI policy planning belongs to the Department of Health; NHI policy implementation is the main duty of the Bureau of National Health Insurance; and NHI policy evaluation is usually conducted by both. The responsibilities of the Department of Health and the Bureau of National Health Insurance are stated below.

4.1 Department of Health

Two groups of the core health policies this year, stated by the minister (Ming-Liang Lee) of the department of Health, were closely related to NHI policy information system:

- (1) To promote the reform of the National Health Insurance system; to expand enrollment; to implement insurance financial responsibilities to ensure financial balance of the insurance program; to extend the practice of global budget payment system; to promote the reasonable amount of ambulatory care; to adjust drug prices; and to prevent the abuse of medical care resources.
- (2) To strengthen the national health information network; to conduct training for health workers; to establish national health databases; to upgrade standards of health and medical research; to promote international exchange in health and medical care, and to strive to be admitted to the World Health Organization (<http://www.doh.gov.tw/english/Welcome.html>).

In his speech "Health Care System in a Transitional Society: A Taiwan Experience," The minister also indicated that, "By the end of 1999, 96% of the total population had enrolled in the NHI program, under which the previously uninsured elderly and young children were covered. With about 94% of all private and public medical care institutions contracted with the Bureau of

NHI, our people now have easy universal and equitable access to quality health services without any financial discrimination. Survey showed that the public satisfaction with the NHI Program has risen from 33% at the beginning to 75% at present. With the universal enrollment, better access to medical care and higher public satisfaction, the NHI has accomplished its objectives."

4.2 Bureau of National Health Insurance (BNHI)

With the implementation of the BNHI in 1995, the public has obtained comprehensive medical care such as health prevention, clinical care, hospitalization, resident care and social rehabilitation. Starting from the Year 2000, the BNHI was committed towards establishing a proactive management-style for the National Health Insurance Program, upgrading healthcare services and public satisfaction levels, as well as providing excellent healthcare services. BNHI also implemented "directional management", firmly established annual objectives and integrated this with various annual plans, strengthening operating substance, effectively utilize resources, and continuing to seek quality improvements in both internal and external services.

As of December 2000, there were 21,400,826 individuals enrolled in the NHI with a coverage rate of 96.16%, up from 92% at the launching period. The BNHI contracted 16,332 medical institutions, which was 91% of medical institutions nationwide. Public satisfaction levels had reached 75%. This year, the BNHI expressed its visions and missions as follows:

Visions of BNHI

- (1) Purchasing Health, not Healthcare for the Public;
- (2) Universal coverage;
- (3) Excellent quality of care;
- (4) Care to disadvantaged groups;
- (5) Financial stability.

Missions of BNHI

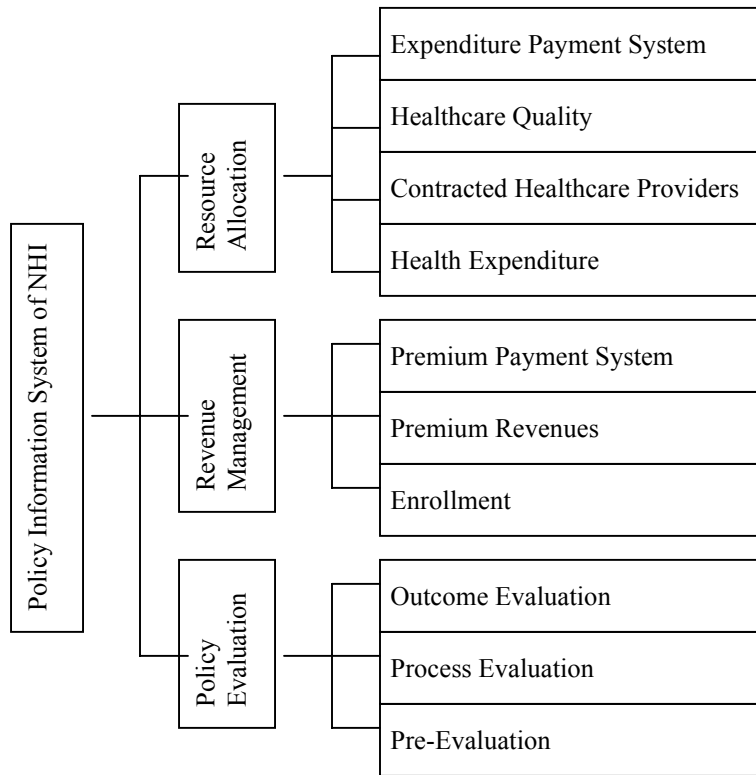
- (1) Health insurance for the public;
- (2) Upgrading quality of healthcare services;
- (3) Establishing partnerships among the medical, pharmaceutical and healthcare Community;
- (4) Using knowledge to create values,
- (5) Creating a virtual competitor and upgrading service efficiency.

In Taiwan NHI is a compulsory social insurance program with the entire population enrolled in the program. Therefore, a fair share of risk-pooling and extensive collection of financial resources for NHI can be expected. In return, all of the insured are provided with the right to equal opportunity of access to healthcare services. All citizens who have established a registered domicile for at least 4 months in the Taiwan area should

be enrolled in NHI. After paying premiums and obtaining NHI cards, the beneficiaries of NHI are entitled to receive comprehensive medical services. Services are available at contracted healthcare institutions such as hospitals, clinics, contracted pharmacies, and appointed medical laboratories, in the case of illness, injury, or childbearing. In addition, to provide continued long-term nursing and medical care, the BNHI has also included home care and hospice care within the scope of National Health Insurance. In addition to providing health care services to insured, the BNHI also provides a portion of its expenditures to health prevention services for children, adults 40 years of age and above, pregnant women and for other women's diseases. The reasoning behind this is the fact that BNHI believes prevention is better than just treatment. These expenditures would help these groups discover their diseases early and seek treatment sooner to better maintain their health (<http://www.nhi.gov.tw/>).

After understanding the background of Taiwan's NHI policy and reviewing the responsibilities of the Department of Health and the BNHI, the policy information system of NHI could be tried to build up by focusing on three dimensions: **policy evaluation, revenue management, and resource allocation**. Policy evaluation refers to the activities related to policy pre-evaluation, process evaluation, and outcome evaluation on modifications or changes in NHI. Revenue management is primarily concerned with the enrollment, premium revenue, and premium payment system in NHI, while resource allocation represents the healthcare expenditure, expenditure payment system, and related issues of managing contracted healthcare provider and healthcare quality. Figure 1 shows the framework of the policy information system. The components of the framework and the information related to each component were illustrated below.

Figure 1. Policy Information System of National Health Insurance



4.3. Policy Evaluation

The information of policy pre-evaluation helps predict what will happen if an alternative is effective; the information of process evaluation defines the advantages and disadvantages in a service delivering system; the information of outcome evaluation helps examine the impacts of an alternative.

4.4. Revenue management

The components under revenue management include enrollment, premium revenue, and premium payment system (each will be carefully described below). During the early stages of the NHI program, the amount of monthly premium revenues was greater than the amount of healthcare expenditures. As a result, reserve surplus has increased over the years. However, starting March of 1998, monthly healthcare expenditures were greater than the amount of premium revenues, causing an ever-worsening financial imbalance. To reduce down time and points for adjustment in insurance premium rates and to protect the quality of healthcare services provided, the BNHI has proposed improvement measures for revenues and expenditures and has actively promoted various cost-saving measures.

4.4.1. Enrollment. As of December 2000, there were 21,400,826 enrolled in the NHI program, an enrollment rate of 96.16%. The number of group insurance applicants has also grown annually. As of December 2000, the total number of group insurance applicants was 562,002. Since its inception in 1995, the NHI has adopted and actively implemented various strategies to achieve its objective of universal enrollment. In terms of concrete measures taken to facilitate universal enrollment, in 2000, the BNHI has expanded the scope of its coverage in coordination with amendments made to the National Health Insurance Act and its enforcement rules by including military servicemen and substitute cadets, overseas Chinese with residence certificate, foreign students, Mongolian and Tibetan students and foreigners under its wing.

4.4.2. Premium Revenue. Since the inception of NHI to the end of December 2000, premium revenues in terms of the cash basis were NTD \$1417.523 billion, healthcare expenditures were NTD \$1410.743 billion and the surplus was NTD \$6.78 billion. On an accrual basis, premium revenues were NTD \$1489.684 billion, healthcare expenditures were NTD \$1450.304 billion and the surplus was NTD \$39.381 billion. Currently, premium revenues are still adequate to cover health expenditures. The collection rate of premiums has been over 95% for each

year. To strengthen audits on insured payroll-related amounts, a cross-comparison between the tax data and the insured payroll-related amount were conducted in 2000. Adjustments were conducted for 89,138 group insurance applicants, resulting in an adjustment of premiums for 303,663 insured. It is estimated that the premium revenues could increase NTD \$167.4 million per month and the annual increase could reach over NTD \$2.0883 billion.

4.4.3. Premium Payment System. In order to realize the policy of compulsory enrollment and maintain equality in premium payment, the BNHI has facilitated the clearing of insurance records and implemented the renewal of interrupted insurance coverage. As of Year 2000, there were over 160,000 interrupted premium payments and over \$11,100,000,000 NTD in make-up premium payments were collected.

4.5. Resource Allocation

Healthcare expenditure, contracted healthcare provider, healthcare quality and expenditure payment system are the crucial components of resource allocation since the premium revenues have been used on healthcare expenditure, given to the contracted healthcare providers, and used for improving healthcare quality.

4.5.1. Healthcare Expenditure. The information of healthcare expenditure has been described above (see premium revenue section). Premium revenue and healthcare expenditure are counterparts, two sides of a coin.

4.5.2. Contracted Healthcare Provider. To provide convenient and comprehensive healthcare services to the public, the BNHI has increased the number of its contracted healthcare providers. In December 2000, there were 16,332 contracted healthcare providers, an increase of 163 from the previous year with a contracting rate (i.e. share of all institutions nationwide) of 90.47%. In addition to the contracted healthcare providers, the number of contracted pharmacies stood at 3,061, the contracted medical laboratories numbered 230, the contracted midwifery clinics numbered 18, the contracted community psychiatric rehabilitation facilities numbered 38 and the contracted home care institutions (including home care services) numbered 304 for a total number of 19,983 contracted healthcare providers to meet different demands from the public. As of December 2000, there were 113,821 beds provided by NHI contracted healthcare providers, of which 88.2% were acute beds, 11.8% are chronic beds, of which, NHI fully paid for 87,926 beds, patients paid for price differentials on 25,895 beds.

In terms of providing home healthcare services, in addition to hospital care, contracted healthcare providers may report ordinary diagnostic services to licensed public and private nursing homes, long-term care institutions and elderly houses. Also, regional education hospitals may report rehabilitation and medical care services provided to physically and mentally impaired welfare institutions. Moreover, subjects of home care have been expanded from home care patients to patients in nursing homes and legally established long-term care institutions.

4.5.3. Healthcare Quality. The BNHI is not only working to increase the number of contracted healthcare providers, but also to monitor the healthcare quality and behavior of practitioners. To protect people's rights, healthcare providers found to misuse medical resources will be corrected and may face penalties such as fines, suspension of contracts for one to three months, or termination of contract. Between January to December 2000, 76 contracted healthcare providers were fined, 304 providers were issued written warnings, 218 healthcare providers' contracts were suspended for one to three months, and 35 healthcare providers' contracts were terminated, amounting a total of 633 cases. Meanwhile, major violations were publicly reported in time. Since its inception up to December 31, 2000, there were 777 cases send to judiciary units due to violations committed and fraud reporting of medical claims.

The BNHI has also taken the initiative to use the Medical Management Expense System and Reported Information Management System to screen changes in information. It also holds regular audits on various projects and announces major violations from time to time to intimidate as well as educate the healthcare providers to reduce illegal occurrences. In addition, the BNHI also promptly distributes a roster of violating contracted healthcare providers to relevant medical groups and the National Medical Union to urge the Medical Community to take self-disciplinary action and to protect the medical rights of NHI beneficiaries.

4.5.4. Expenditure Payment System. Reforming NHI has been an important issue in recent year and the government's reform effort is now accelerating due to a looming financial crisis. To contain the continuing escalation of health care expenditures, the BNHI paid great attention to the expenditure payment system. Various medical services were subject to reasonable payments to increase quality of healthcare services and establish a good relationship between healthcare providers and patients. Thus, there is a crucial need to conduct studies on standard for payment of medical expenses. The global budget payment system was applied on dental service as of July 1st 1998. Its growth rate of health expenditures has been limited to 8% since its

implementation three years ago. Growth rate of medical expenditures has been reduced for the third year to effectively lower medical expenses. In order to rationalize the pharmaceutical expenditures, pricing adjustments were made for the following items: the brand-name drugs with prices higher than the median of the same brand-name drug prices of ten developed countries, and generic drugs with prices higher than 80% of the brand-name prices. The prices of 633 items were adjusted in 1996 and that of 710 in 1997. There were no price adjustments in 1998. In order to rationalize the pricing principle, and to narrow down the price difference of drugs with same ingredients and same contents, classification and grouping of prices have been conducted between drugs with same specifications. Currently, grouping prices for large intravenous dip such as Normal Saline and Dextrose have been completed at average reduction rate of 3.8% in 1999. These adjustments were effective from October 1st 1999. Grouping prices for 100 drug items such as Aspirin was implemented in Year 2000. New prices were effective on April 1st 2001. The BNHI has been endeavoring to adjust the payment of medical devices by their functions in order to resolve the price difference among similar medical devices and to rationalize the payment. The BNHI has contracted with 17 banks that have more than 5,500 branches nationwide to collect premiums and to pay healthcare providers medical payments on behalf of BNHI. As of April 1998, the transmission of information between the BNHI and contracted banks has been carried through ISDN (the Integrated Services Digital Network) to increase efficiency in data management.

4.6. Policy Information System of National Health Insurance

The policy information system should systematically, frequently, and automatically collect, store, and analyze above data or information of each component. Currently, the BNHI has established an information management system to assist them in handling an average of 27 million medical claims monthly. To facilitate medical claims, expedite the payment process, and increase the accuracy of claim information, the NHI has offered electronic claim services to health care providers since its inception. Electronic claims have reached a rate of 99%, much better than the rate of 12% at the launching period of NHI. From March of 1999, the BNHI began to offer online claim services, opening more claim channels for the healthcare providers. The information systems have also contributed to the efficiency in the review of medical expenses. In Year 2000, the average number days for processing claims were 62.68 days for outpatient services, and 69.99 days for inpatient services. It was also broadly used in the internal management of the BNHI to increase its

administrative and management efficiency. For example, the information system helps control and review of official document, arrange staff working hours (personnel administration), project management system etc.

However, the functions of the proposed policy information system are somewhat different from those of the existing information system. The policy information system of NHI is expected to provide information directly related to policy planning, implementation, and evaluation. In other words, the policy information system will be policy and problem solving oriented. It is expected to continually, regularly, and systematically collect and store past and current information on policy evaluation, revenue management, and resource allocation (shown in Figure 1). Whenever new policies are proposed, the policy information system can instantly provide plenty of information as reference to new policies. To a large extent, the policy information system can provide related knowledge to new policies through shared, accumulated, or created knowledge on three main dimensions of NHI policy--policy evaluation, revenue management, and resource allocation. Besides, based on structured information stored in the proposed policy information system, policy makers can regularly review the status quo as well as frequently examine the effectiveness or efficiency on every aspect of NHI policy, and, therefore, the system will benefit old policy revision and new policy design. Given the features, the policy information system also possesses the function of decision support to provide policy makers with adequate, specific policy-making information.

Although the proposed policy information system for Taiwan's National Health Insurance Policy has not been actually carried out, it is expected that there will be a wide scope of users to the policy information system. The users can be divided into two categories: internal users and external users. It goes without saying that the staff of the executive agencies, especially those in the Department of Health and the Bureau of National Health Insurance, will be the internal and primary users since they need to maintain, update, and use related information for particular policies all the time. In terms of external user, the Legislature Yuan or the legislative staff interested in NHI policy can monitor and understand the NHI policies in detail by virtue of the policy information system. Besides, either direct or indirect stakeholders, such as healthcare providers, labor unions, doctors, patients, and all insurance buyers (the general public) can take advantage of the policy information system whenever they would like to know more about NHI policies. Overall, the policy information system can be treated as a channel for communication, monitoring or information delivery to all internal and external users.

5. Conclusion

In order to meet the requirements of democracy and achieve the goals of knowledge management, policy information systems are recommended and illustrated in this paper. The functions, benefits, and costs of policy information systems are described above. Besides, this paper tries to construct a policy information system for Taiwan's National Health Insurance Policy. The proposed policy information system (shown in Figure 1) is a reference mode or ideal type. The policy information system is expected to include three main dimensions--policy evaluation, revenue management, resource allocation--and ten components--policy pre-evaluation, process evaluation, outcome evaluation, enrollment, premium revenue, premium payment system, healthcare expenditure, healthcare contracted provider, healthcare quality, and expenditure payment system (indicated in Figure 1).

This paper concludes with some suggestions to a useful policy information system. The performance of a policy information system should be evaluated in two aspects: the policy information system itself, and the users of the system. Regarding the policy information system itself, the performance indicators can be the degree of the content related to the policy, the frequency of system updating per week, the quality and amount of the information provided, the degree of the user friendliness in the system etc. In terms of the users, the frequency of use per week, the users' feedback, the types of users and so on can be the performance indicators to evaluate a policy information system.

However, the design of policy information systems should learn the lesson of "soft underbelly of hard data" (called by Mintzberg, 1994) from the experience of strategic planning in Planning Programming Budgeting System (PPBS). The information provides by the proposed policy information system might be limited in scope, lacking richness or fail to encompass important non-economic and non-quantitative factors. Furthermore, it is possible that the information might be too aggregated for effective use, too late to be of use, or too abundant to be reliable (Mintzberg, 1994). In order to avoid the above problems, the proposed policy information system for Taiwan's NHI policy should try to produce knowledge and soft information as the base for users' judgments, rather than redundant analyses or mechanical manipulation of hard data.

It is wished that the paper can shed the light on the application and research of policy information systems in government at all levels and across all branches. Furthermore, for the academicians as well as practitioners, the study can also promote the comprehension of policy information systems. Future

research can focus on the examination of the feasibility and usability of policy information systems.

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