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Topic (ii): From local to corporate perspective (industrialization and standardization)

Development of the Generic Statistical Information System

Invited Paper

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I. Introduction

1. The Republic of Korea adopts the decentralized statistical system for the purpose of using expertise from all the fields and meeting statistical demand on time. Under the decentralized system, each agency produces statistics according to their individual needs, which causes the redundancy among statistics. And the statistical production system is developed and maintained by each agency. As a result a huge amount of national resources are being wasted. In particular, since the majority of statistical agencies depend on outsourcing when producing statistics due to the absence of their own statistical information system, there are some difficulties in follow-up and validation. Furthermore the statistical production processes are different from agency to agency. As the quality of statistics is checked after the statistical production, the evaluation and feedback is delayed.

2. Statistics become more and more important all over the world. But in Korea the reliability of statistics gets lower and the status of national statistics gets downgraded due to the absence of the national statistics governance system. Accordingly, it's necessary and urgent to establish the Generic Statistical Information System and prepare the methods of improving the quality of national statistics so as to enhance the status of national statistics and follow the change in the global statistical paradigm.

3. In 2010, the KOSTAT carried out the BPR/ISP to improve the production and management of national statistics. According to the BPR/ISP the KOSTAT is building the Generic Statistical Information System, which is aimed to support the entire statistical business process from survey planning to production, dissemination and data archive of all the statistical agencies.

4. This paper introduces the current problems of national statistics and our efforts to solve these problems. In Chapter II the current status and problems of national statistics will be presented. In Chapter III the methods to improve the production and management of national statistics will be explained. Finally in Chapter IV the future plan will be shown.

II. Current Status and Problems.

A. Current status of statistical business process

5. The Republic of Korea adopts the decentralized statistical system in terms of the organization of statistical production. And the KOSTAT coordinates overall administration of national statistics.

6. According to the Statistics Act, 832 kinds of statistics were approved as national statistics as of April 1st, 2011. 90 kinds of statistics are designated ones, while 742 kinds of statistics are general ones. By the compilation method of statistics, 331 kinds of statistics are survey statistics, 443 kinds of statistics are administrative statistics and the remaining 58 kinds of statistics are analytic statistics. By the type of agency, governmental agencies produce 686 statistics, while non-governmental designated agencies produce 146 statistics. The KOSTAT produces 53 statistics.

7, As for human resources, the number of central government officials responsible for statistical production amounted to 4,530 persons. There are few government officials exclusively in charge of statistical production, and frequent changes in personnel cause discontinuity of statistical work. Furthermore, most of agencies except for the KOSTAT produce statistics through outsourcing due to their lack of expertise.

B. Current status of the information system

8. The KOSTAT produces 53 kinds of statistics by using 47 individual survey systems. Only 5 kinds of household-related survey systems are integrated into one system, but the other systems are being individually operated for the specific surveys.

9. As for economic statistics, the KOSTAT carries out a few surveys simultaneously at a specific point in time to reduce response burden. But the survey systems are not integrated, which results in some limitations in the usefulness of the integration of some economic surveys. In particular, survey systems that were developed in the early stage need to be redeveloped, for recent information technologies were not applied to the system. As for quarterly and annual surveys, survey items tend to change quite frequently. As a result, a relatively huge amount of money will be spent and a great amount of efforts should be made.

10. Out of a total of 375 statistical agencies that produce national statistics, only 27 agencies manage their own statistical production system. In other words, when producing and managing national statistics, the majority of agencies depend on outsourcing companies since they don't have their own statistical information system

C. Problems

11. Considering the above-mentioned situations, problems in the production of national statistics can be summarized as follows:

- First, as for statistical business, frequent changes in personnel result in the discontinuity of statistical work. The standard statistical information system was not established. And the infrastructure for the production and management of national statistics is not sufficient.
- Second, as for the information system, statistical agencies developed their own information system individually without sharing common resources. A great amount of money is spent on the maintenance of the individual systems. In other words, statistics are inefficiently produced due to absolute lack of the statistical production system. Above all, metadata and microdata are not properly managed

III. Methods to Improve the Production and Management of National Statistics

12. In 2010 the KOSTAT made out the methods to improve the production and management of national statistics in order to prevent the redundancy of statistical production through comprehensive coordination of national statistics. The KOSTAT is building the Generic Statistical Information System that all the statistical agencies will commonly use in order to carry out statistical work efficiently. The methods are as follows:

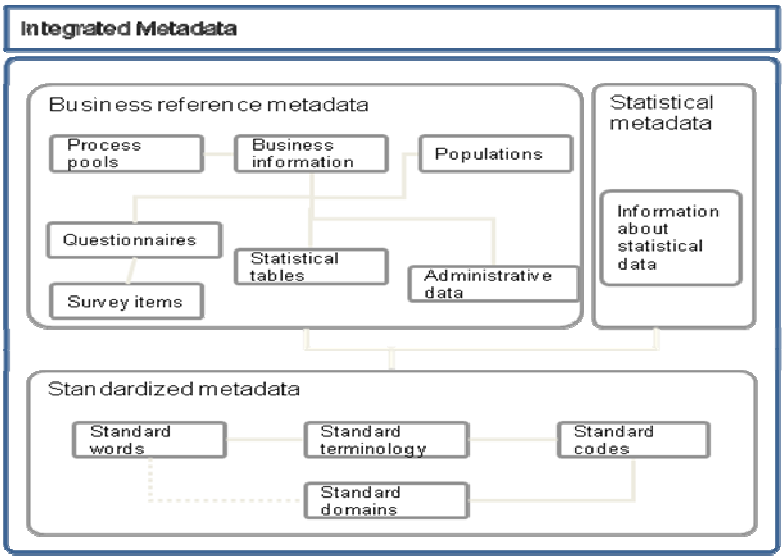
- First, the KOSTAT will redesign the process of production and dissemination of national statistics.
- Second, the KOSTAT will build the Generic Statistical Information System to support the statistical with consideration of specific characteristics of respective statistics.
- Third, the KOSTAT will establish the governance system to coordinate and control national statistics.

A. Redesign the process of production and dissemination of national statistics

13. The KOSTAT analyzed the current status of metadata management of 860 kinds of statistics produced 360 agencies(there were 860 kinds of statistics produced 360 agencies when we analyzed. Therefore, number of statistics is a little bit different), and derived metadata items for systematic management. And the KOSTAT established the integrated metadata management system after analyzing advanced experiences from statistical agencies of Canada, Australia, etc.

14. Metadata consist of 1) statistical metadata that help users to interpret and understand statistics, 2) business reference metadata that define items, methods and procedures of statistical work and 3) standardization metadata that are needed to follow the standard information system.

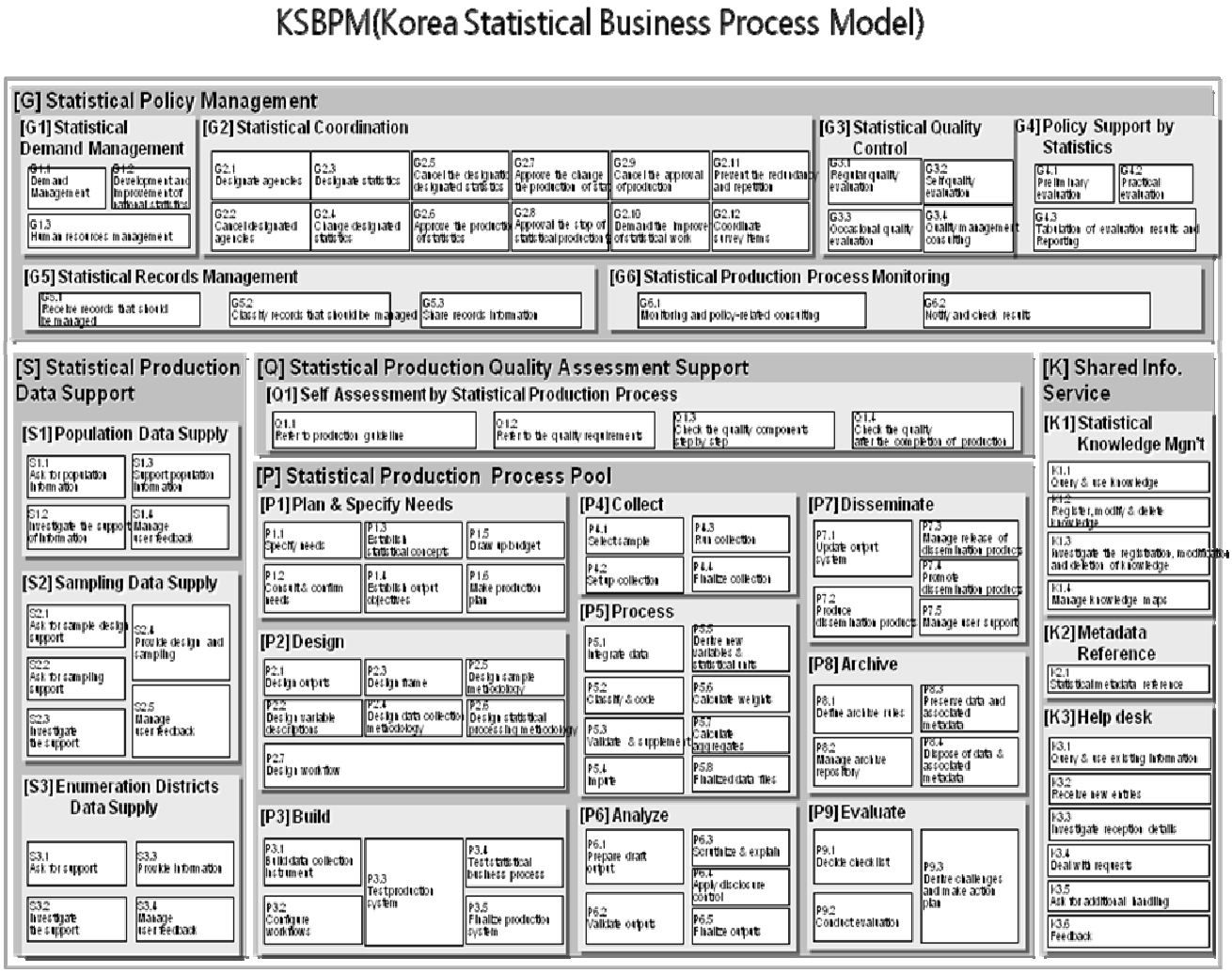
15. Statistical metadata contain information on statistics such as the survey overview and the methods of data dissemination. Business reference metadata include information on process pools, questionnaires, populations and administrative data. Standardization metadata include standard words, standard terminology, standard domains and standard codes



<Figure 1 Integrated Metadata Configuration>

16. The KOSTAT analyzed the statistical production process by the type of statistics for the purpose of redesigning the optimized statistical business process, and then established the KSBPM (Korea Statistical Business Process Model) by referring to the GSBPM (Generic Statistical Business Process Model) that is applied by statistically advanced countries and international organizations.

17. The KSBPM is a flexible tool to describe the set of statistical business processes needed to produce Korean official statistics. The KOSTAT defined and developed the KSBPM under the basic principles of 1) integrating the statistical policy process and the production and management process of national statistics for organic linkage between policy and production, 2) controlling the quality of statistics all the time, 3) systematizing and activating support process, and 4) sharing useful knowledge and information needed for statistical production. The KSBPM comprises four levels: Level 0 (Mega process), Level 1 (Process), Level 2 (Activity) and Level 3 (Task).



<Figure 2 KSBPM>

B. Build the GSIS to support the production with consideration of characteristics of respective Statistics

18. The KOSTAT made the plan for the development of the generic information system after analyzing the functions of domestic and foreign production systems, and then defined the structure of the Generic Statistical Information System in terms of application, data, technology and security to improve the flexibility of statistical production.

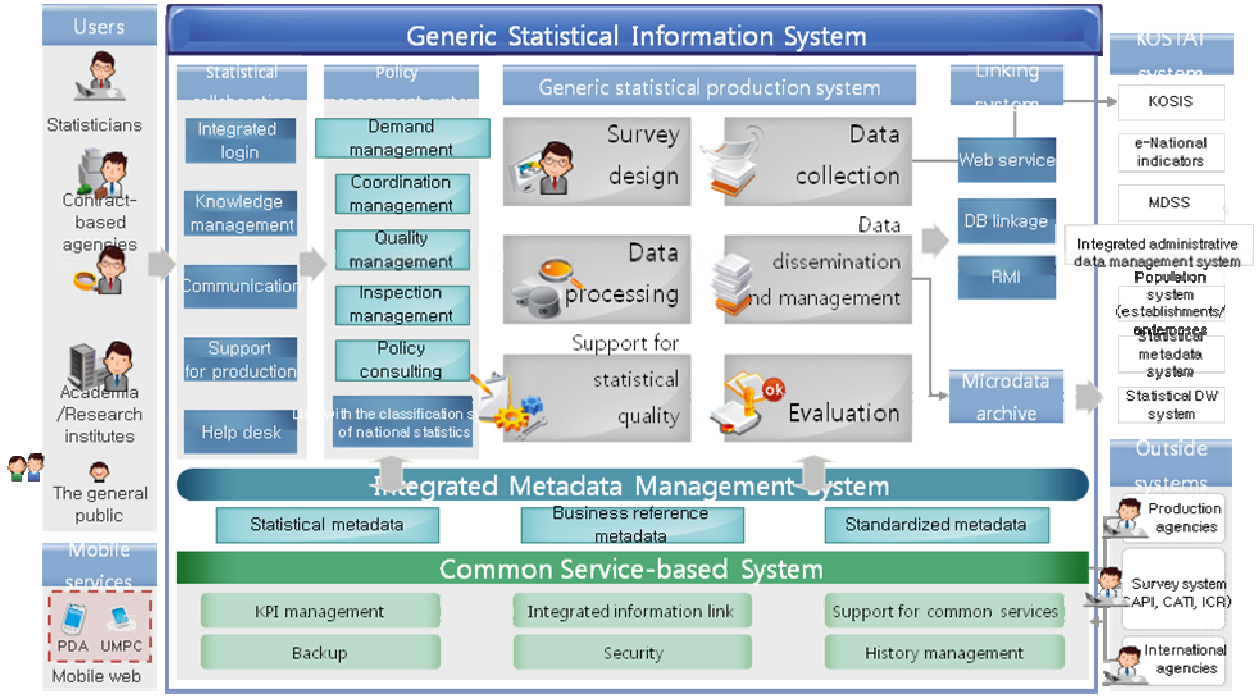
19. The Generic Statistical Information System comprises four components; statistical collaboration & portal system, policy management system, generic statistical production system and integrated metadata management system.

20. The generic statistical production system consists of 4 sub-systems; survey design, data collection, data processing & analysis, and data management. Each sub-system can be combined according to the characteristics of statistics and services. The system will be developed to serve scalability and convenience so as to face a variety of statistical environment and changes in statistical business processes.

21. The policy management system covers the all the functions of statistical demand management, coordination, quality management and statistics-based policy management. The system is also designed to share information by linking with the production system and to utilize various metadata and statistical information in the stage of demand and approval of national statistics.

22. The statistical collaboration portal & common service system provides a single window for the production and management business of national statistics such as integrated query, knowledge management, collaboration support, services support, public relations management, integrated login, integrated authority management and system management.

23. In addition, the Generic Statistical Information System is designed so that the production system can be composed on the basis of the KSBPM. The Generic Statistical Information System comprises the standard process, systems and sub-systems.



<Figure 3 Generic Statistical Information System Architecture>

24. The KOSTAT analyzed 860 kinds of statistics from 360 statistical agencies for the purpose of helping them to change their statistical production system into the Generic Statistical Information System. Durable years and the level of aging of the production support system were investigated, and the importance and sensitivity was analyzed.

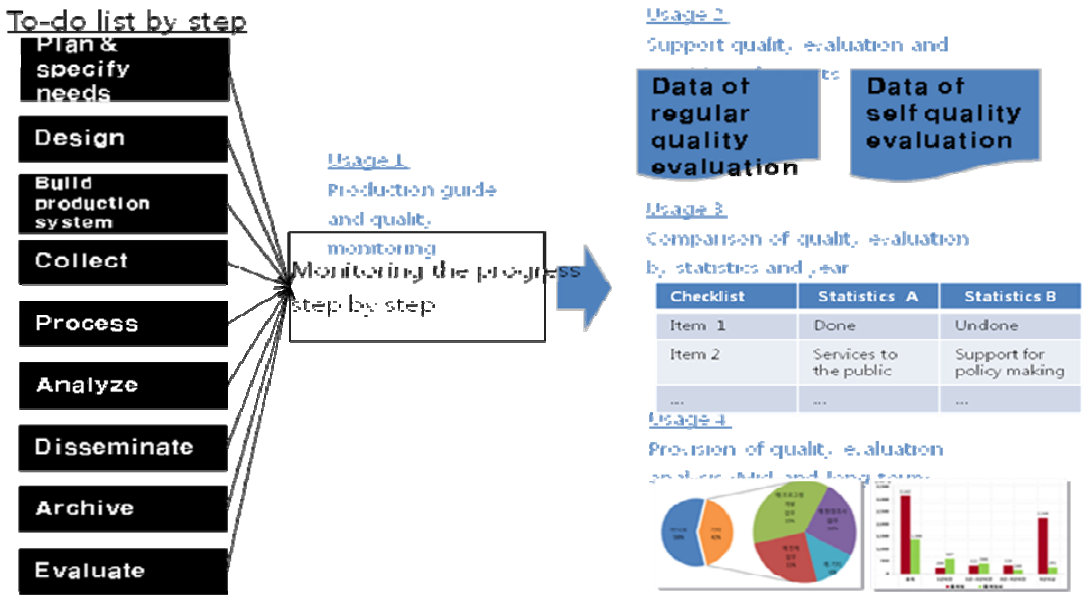
25. To minimize confusion and trial & error of statistical agencies, the Generic Statistical Information System will be used in a small group of statistical agencies at first and then expanded to the entire agencies. And the GSIS will be applied gradually from less complicated business to more complicated business. And in terms of scope, the GSIS will be applied and expanded step by step.

C. Establish the governance system to coordinate and control national statistics

26. The KOSTAT analyzed the experiences of advanced countries regarding the comprehensive coordination of national statistics so as to systematically support the whole processes of approval, production, dissemination and disposal of statistics. And the KOSTAT analyzed the domestic production process, and the current status of policy support.

27. The KOSTAT will establish a single window for policy management so as to carry out policy management in an efficient manner and reduce workload and confusion of officials responsible for statistical production. And the KOSTAT will improve the policy management system by integrating metadata, using the e-document exchange system for government officials (On Na Ra in Korean) and managing policy records. To make plans for the quality improvement and assurance by using the Generic Statistical Information System, the quality management systems of Australia and England were analyzed.

28. According to the plan, the quality management will be carried out from the beginning of statistical production, not after the completion of statistical production. To do so, it's necessary to establish the information system. And the items used for regular and self quality evaluation are provided as a "to-do list" at each stage of production. This to-do list will be used as a guide or a checklist for quality management.



<Figure 4 Plans for quality improvement and assurance>

29. To jointly produce and use national statistics through the Generic Statistical Information System, legal and institutional framework should be established. Therefore, the KOSTAT analyzed the current legal and institutional framework related to the development and operation of the system, the active use of the system and the protection of shared information.

30. Based on the Statistics Act and its Enforcement Ordinance concerning the development and management of a system, the KOSTAT plans to establish a basis and regulations for the system development and the expansion of system use. And the KOSTAT will prepare a guideline for the protection of shared information. And the KOSTAT will consider the settlement of conflicts among interested parties in relation to the obligation of system use.

IV. Future Plan

31. Based on the ISP, which was aimed at developing the Generic Statistical Information System, the KOSTAT will establish the infrastructure of the system, expand the system and strengthen the system for three years.

32. First, in 2011 the KOSTAT will establish the infrastructure of the Generic Statistical Information System. The KOSTAT will build a model production system, which can be commonly used by 30 statistical agencies. The KOSTAT will integrate the statistical policy system from statistical demand to quality control. And the integrated metadata system will be developed.

33. Second, in 2012 the Generic Statistical Information System will be expanded. The production system will be applied to 120 statistical agencies. The tabulation and analysis system will be strengthened. In addition, the sampling system will be developed.

34. Third, in 2013 the KOSTAT will strengthen the Generic Statistical Information System. The production system will be applied to all the statistical agencies. The Generic System will be focused on supporting specialized functions of respective statistical agencies. And the quality management will be strengthened. Furthermore, it's necessary to establish the national statistics analysis system and the support system for statistics-based decision making.

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