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Establishment of the Korea Statistical Business Process Model and Quality Management

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I. Introduction

1. The Statistics Korea (KOSTAT) has tried its best to improve the national statistical system; Strengthening the statistical coordination and management, introducing regular evaluation of statistical quality and implementing the statistics-based policy management system to support the decision-making based on statistics.
2. In spite of these efforts, there's still a possibility of wasting resources due to duplication and redundancy of statistical production because currently statistical agencies produce and manage statistics separately. The absence of the standard business process model leads to great difficulties of data management and integration. Maintenance expenses for the system management and operation are steadily increasing due to the development of the statistical production system in a separate manner. Besides, a lack of skilled statisticians working for statistical agencies is problematic.
3. To solve these problems, in 2010, the KOSTAT established the BPR/ISP to improve the national statistics production and management system. In 2011, the KOSTAT is building the generic statistics system to support all the processes from statistical planning, production, dissemination and archiving for common uses among statistical agencies.
4. This paper presents the national statistics production and management processes, which were established through the BPR/ISP in 2010, and the generic statistics system, which is based on the BPR/ISP.
5. Section II shows the processes of deriving national statistics production management process pools. Section III suggests the Korea Statistical Business Process Model (KSBPM). Finally, methods to ensure the quality of national statistics and the application plan of the generic statistics system will be elaborated.

II. National Statistics Production Process Pools

A. Need for standardization of statistical businesses to produce statistics efficiently

6. The national statistics quality evaluation project, which was implemented from 2006 to 2010, succeeded in improving the awareness of the quality of all the statistical business processes from planning to dissemination. However, the project didn't provide specific manuals or reference models of the national statistics production process. In the meantime, the project served as an opportunity for statisticians to realize the importance of the quality management within the statistical production system, not post-evaluation of quality.

7. Also, because there's no standard production process, each statistical agency produces statistics in its own way. Furthermore, agencies whose statistical staff members frequently change their responsibilities are compiling statistics in insufficient and ineffective manner, which leads to the decline in the quality of national statistics.

8. Taken together, at the national level it's urgent to develop the standard statistical business model to improve the quality of national statistics and increase productivity. At the international level, the Generic Statistical Business Process Model (GSBPM) is more widely applied to establish the criteria of statistical production and to improve the productivity of quality management and statistical production. And the GSBPM is utilized as a standard of the statistical information system.

9. To face with these domestic and international environmental changes, the KOSTAT will have to establish the standard business process model.

B. Derivation of production process pool candidates

10. The KOSTAT analyzed some manuals & recommendations, which define the statistical business processes, related laws and the GSBPM as process pool candidates. The major features and considerations of candidates are as follows;

Table 1. Major features of production process pool candidates

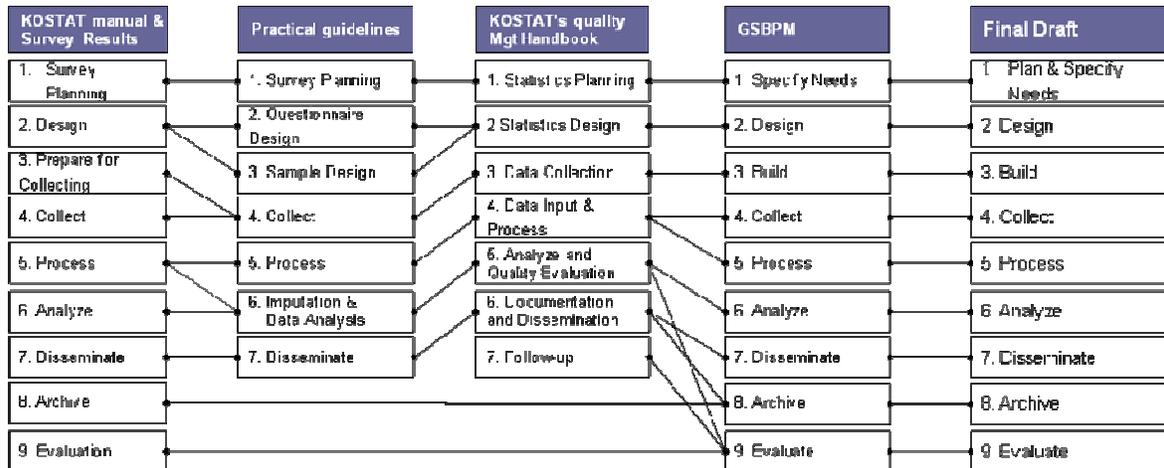
Classification	Features	Considerations
Statistics Law of Korea	. Present definitions and requirements of national statistics production businesses	. Doesn't present production phases clearly and business processes to be implemented
KOSTAT manuals and survey results	. Systematically present production processes of 52 kinds of national statistics that are produced by the KOSTAT, a central statistical agency of Korea	. Not official production processes . Can be used when verifying applicability and usability of the standard production process
Practical guidelines of national statistics	. The only official guidelines of national statistics . Describe business processes with a focus on statistical production, in particular, data input and processing	. Doesn't present sub-processes that should be implemented / Focus on the production of survey statistics . Doesn't present guidelines on administrative and analytic statistics
Production processes of KOSTAT quality management handbook	. The only detailed description of statistical production processes by stage . Consider the characteristics of survey, administrative and analytic statistics	. In terms of the processes after documentation and data dissemination, the handbook is focused on objects necessary for quality management and criteria, i.e. the handbook doesn't cover the entire production process.

GSBPM	<ul style="list-style-type: none"> . Generic Statistical Business Process Model v4.0 . One of the most comprehensive business models to cover survey, administrative and analytic statistics 	<ul style="list-style-type: none"> . The model is ambiguous to apply in Korean statistical environment. It's necessary to redefine the model.
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C. Derivation of a production process pool

11. According to the candidate review results, there was no candidate that covers the production of survey, administrative and analytic statistics. Therefore, the KOSTAT derived a standard production process model after comparing and supplementing candidates as follows. For officials in charge of statistical production to understand their business clearly, the standard process has been reorganized, basically on the basis of GSBPM 4.0, by adding or grouping some stages and processes to cope with Korean environment.

Figure 1: Adjustment of the production processes:



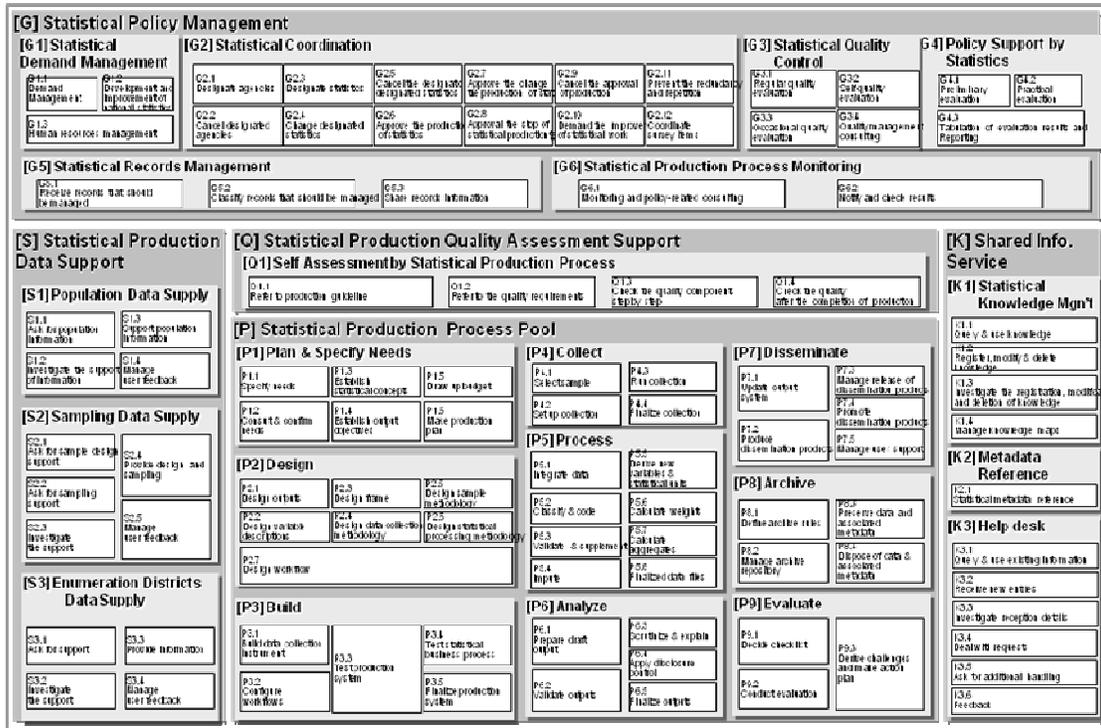
III. Establishment of the Korea Statistical Business Process Model

A. KSBPM composition

12. The KSBPM comprises 4 parts;
- ① Policy management, to overcome the shortcomings of the decentralized system and to secure governance of national statistics
 - ② Production management, to manage all the production processes from planning to production, dissemination and evaluation
 - ③ Production support, to support the efficient statistical production
 - ④ Sharing of statistical metadata, to share knowledge and information necessary for statistical production.

B. KSBPM architecture

Figure 2: KSBPM Architecture



13. Each process consists of four levels: L0 (Mega Process), L1 (Process), L2 (Activity) and L3 (Task). English characters representing mega process are assigned to respective process IDs. Numeric figures are assigned to further levels of detail. Mega process is categorized into 5 parts: ‘G: Governance, policy management’, ‘P: Production, statistical production’, ‘S: Support, production support’, ‘K: Knowledge, information sharing’ and ‘Q: Quality, Quality support’.

14. In particular, the KSBPM applies the following structure, based on the GSBPM;

- o Level 0 : Statistical business process
- o Level 1 : Nine phases of the statistical business process
- o Level 2 : Sub-processes within each phase
- o Level 3 : A description of those sub-processes

15. According to process modeling theory, each sub-process should have a number of clearly identified attributes, including;

- o Purpose (nature of business)
- o Input (resources input)
- o Output
- o Enablers (department)

C. Major characteristics of the KSBPM

① Derivation of quality support process to secure statistical quality

16. To change from the current quality management with a focus on post-management to quality management at all times, the KOSTAT added a process to check statistical quality during the all the processes and to manage essential components of each process. The quality management process can be internalized in each process to help officials concerned reduce their quality management burden. The internalized activities will increase statistical quality from the stage of statistical production, and contribute to the increase in the understanding of statistical quality by officials concerned, for they can refer to implementation guidelines and quality requirements in advance.

② Derivation of data sharing process to share statistical knowledge

17. The KOSTAT derived statistical information sharing process to maximize business efficiency and minimize trial and error when producing statistics. The data sharing process guarantees the continuity of businesses in the case of changes in officials concerned, and minimizes the burden of new staff members. Besides, the help desk management function was added to accept opinions from statisticians and users.

③ Derivation of statistical production support process

18. The KOSTAT plans to reduce the burden of statistical production by activating the current production support process, and to support efficient statistical production by deriving a production support process needed for field survey management. The following functions were added; Population information support to secure survey objects and to choose survey objects; Sample design support to extract samples from the population; Enumeration district (ED) and map support to select EDs accurately and to manage EDs efficiently.

19. By deriving above-mentioned processes, the following effects are expected;

- Organic linkage between policy and production

The monitoring of statistical production in policy management and quality support in the stage of production will be linked. Statistical quality will be monitored during the production processes at all times. Monitoring results will contribute to strengthening the quality of national statistics and governance functions.

- Change into quality management at all times

The quality of official statistics will be upgraded by changing quality management carried out after the completion of statistical production into quality management to be carried out from the beginning of statistical production.

- Strengthen production support process

The KOSTAT will reduce the burden of statistical production and improve business efficiency of statistical agencies and data accuracy by activating the systematic production support process such as population management and sample management.

- Strengthen the sharing of related knowledge and information

To verify data during the entire process and to reflect opinions of statistical users when improving current statistics and developing new statistics, the sharing of related knowledge and information will be strengthened.

IV. Statistical Quality Assurance and the Application of the Generic Statistical Information System

A. Establishment of the quality management-based statistical production system

20. Currently, the KOSTAT assesses statistical quality in three ways;

21. First, every year regular assessment of statistical quality is carried out by an outsourcing company to check the overall quality of official statistics, which are used for policy making and evaluation. This regular assessment is aimed at upgrading the overall quality of national statistics and their reliability. During the entire processes from statistical production to data dissemination, infrastructure for quality management, the status of reflecting user needs, detailed production procedures, data accuracy and data dissemination are evaluated. Problems and their causes are identified, and quality improvement plans are presented.

22. Second, a huge amount of money, time and administration is needed for regular quality evaluation by experts. Therefore, the KOSTAT itself carries out self-evaluation of statistics produced by the KOSTAT and other statistical agencies to derive improvement plans and implement them.

23. Finally, the statistical quality assessment team of the KOSTAT performs occasional evaluation in case self-evaluation isn't carried out or there are considerable reasons to think that statistical quality is low.

24. The KOSTAT built the information system to change quality management focused on post-evaluation into the quality management applied to all the processes. Based on a checklist used for regular evaluation and self-evaluation, the KOSTAT made a to-do list for respective production stages. The list contains basic quality evaluation items. In this case, the increase in the number of evaluation items may give more burdens to statisticians in production agencies. In the meantime, the efficiency of quality management will be increased.

25. As for evaluation items that can be checked within the system, the performance of corresponding functions and the input of related information will be automatically checked. As for evaluation items that officials concerned need to check, performance status and performance results should be inputted into the system.

26. On the basis of this process, progress of each performance stage can be monitored. And these results of regular evaluation and self-evaluation will be used as a basic report without additional workload. Currently as for regular evaluation and self-evaluation items, in the case of survey statistics, 98 out of 208 items (47%) can be checked through the generic statistical information system.

27. In other words, during the entire production process, quality evaluation framework is provided at sub-process level. This means that the system was built in a way statistical business process is carried out along with quality management and evaluation side by side.

B. Development of the KSBPM-based generic statistical information system

28. The generic statistical system consists of 4 sub-systems. Statisticians can select necessary functions and procedures from a component pool, and then organize and operate the statistical production system according to the characteristics of statistics. Scalability and convenience should be considered. And based on the KSBPM, the production system can be designed. The system will be operated through mapping at the standard process, system and sub-system level.

29. In particular, the system for each production stage is designed to be mapped with mega processes of the KSBPM. The system is composed of sub-systems that support necessary functions.

Generic statistical system	Functions	Statistical processes of the KSBPM
Statistical Design System	The statistical design system covers statistical planning (P1) to the development of the statistical production system (P3) of the KSBPM. In this system, statistical agencies make and correct a planner, apply for the approval of statistics, design statistical outputs and build the statistical production system.	<ul style="list-style-type: none"> •P1 Plan •P2 Design •P3 Build
Data Collection System	The data collection system consists of data collection (P4) of the KSBPM. In this system, statistical agencies manage the collection of raw data to be used for the production of survey, analytic and administrative statistics.	<ul style="list-style-type: none"> •P4 Collect
Data Processing System	The data processing and analysis system covers data processing (P5) and analysis (P6) of the KSBPM. The system supports data processing, imputation, editing and aggregation.	<ul style="list-style-type: none"> •P5 Process •P6 Analyze
Data Management System	The data dissemination system comprises data dissemination (P7), documentation and archiving (P8) and evaluation (P9) of the KSBPM. The system supports data dissemination, data transfer to KOSIS and statistical DW, organization of evaluation items, conducting evaluation and organizing the evaluation report.	<ul style="list-style-type: none"> •P7 Disseminate •P8 Archive •P9 Evaluate

V. Future plans

30. The development of the generic statistical information system is a large-scale project that covers a variety of statistics produced by diverse statistical agencies. Therefore, the project should be progressed step-by-step and expanded to minimize the confusion of statistical agencies. As a mid and long-term plan, in 2011 the KOSTAT started building infrastructure of the statistical production system. In 2012 the generic system will be expanded. In 2013 the functions of the generic system will be enhanced.

31. The KOSTAT organized a consultation body, which is composed of internal and external experts. And the KOSTAT carries out the project through close cooperation with other statistical agencies. Until the end of 2011, the Statistics Law will be amended to lay the legal foundation.

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