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Regional initiatives: Modernization of statistical information systems

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Modernization of statistical information system - the “Big Four Projects” of Chinese statistics**

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I. Preface

The statistical work in China has achieved sound and fast development since the implementation of the reform and opening up policy. A relatively complete national statistical survey system has basically taken shape, with the system of national accounts as the core, and supported by statistics on national economic activities and key areas of economic and social development. However, census and regular surveys targeting enterprises of different industries or activities are designed separately. As far as the statistical data production mode is concerned, each subject-matter department collects independently the raw data and completes all steps of the statistical business process. As a result, subject-matter departments are not complementary to each other with the lack of consistency in statistical systems, methods and standards, which has restricted the application of modern information technology to statistics and affected the efficiency and consistency of statistical work and data.

In 2008, a warm debate on implementation of scientific approach to development was rolled out in all government agencies all over the country. The key issue of the debate was how to further promote the sound and rapid development of national economy and society. In this context, the National Bureau of Statistics of China (NBS) and the entire statistical system discussed how to promote sound development of Chinese statistics and improve its consistency with international standards. Government agencies involved in statistical production and management at all levels put forward more than 690 pieces of comments and suggestions on improvement of Chinese statistics. On this basis, the NBS made serious comparison and took advantage of international experiences including the concepts, observations and practices gained through long-term cooperation with other National Statistical Offices and international organizations to sort out a number of 89 areas for improvement, which were further

integrated into an operational plan for overall improvement and optimization of Chinese statistics. This is what we refer to as the Big Four Projects.

In 2010, on the basis of adequate pilot operations, scientific research and validation, the NBS decided to launch the construction of the Big Four Projects to reform the traditional statistical production methods, administration system and working mechanism. It is envisaged to strengthen the integrated design and unified organization and implementation of statistical surveys, avoid duplication, overlaps and contradictions, introduce more extensive application of modern information technology and further enhance the official statistical capacity, quality of statistical data and the credibility of the government statistics.

As of February 18 this year, up to 700,000 enterprises in the country have started to submit the basic statistical data directly to the National Data Center or the provincial data center certified by the State via the Internet. Among them, there are over 320,000 industrial enterprises above designated level, about 90,000 construction enterprises with designated qualifications, 90,000 real estate enterprises with designated qualifications, over 120,000 wholesale and retail enterprises above designated level, and about 40,000 hotel and catering enterprises above designated level. The economic volume of the enterprises adopting the integrated business survey programmes accounts for more than 80 per cent of the total. At present, the integrated business survey programmes via direct on-line reporting system are running smoothly on the whole. The NBS has successfully completed the data collection for the 2011 annual report and the monthly reports for February-March 2012, with the online submission rate exceeding 98 per cent and satisfactory quality of data.

II. Contents of the Big Four Projects

The Big Four Projects are: business register of basic units, integrated business survey programmes, data collection and processing software system, and direct on-line reporting system.

A. Build the business register of basic units

The construction of the Business Register follows the principles of “unified management by NBS, labor division and cooperation among subject-matter departments, shared responsibility at the local levels, joint participation and information sharing by all stakeholders”. Based on the results of economic census, the Register covers the basic information of all legal entities and establishments and is regularly updated and controlled by making full use of administrative records from the State Commission Office for Public Sector Reform, the Ministry of Civil Affairs, the Bureau of Taxation, the Bureau of Industry and Commerce Administration, the Bureau of Quality Control and Inspection, *etc.*, as well as the data from business survey programmes. Managed centrally at the NBS, the Business Register of Basic Units which maintains coherent and accurate information and is timely updated, provides sound and complete database and sampling frames for various types of regular statistical survey programmes on basic units.

B. Build the integrated business survey programmes

By integrating various survey programmes separately conducted on enterprises into a single set of e-statements, integrated business survey programmes unify the collection of raw data, the definitions, calculation methods, classification criteria and the statistical coding of the same indicators in different subject-matter questionnaires. The purpose is to build a uniform,

standardized and convenient business survey system that meets the statistical needs of various levels of Party committees, governments, economic entities of various kinds and the general public, as well as the needs of subject-matter departments and national accounts, and to reduce the workload of enterprises and grassroots statistical agencies.

C. Develop the data collection and processing software system

In accordance with the overall requirements for development of a uniformly compatible and user friendly software system with complete functions, we rely on a standardized statistical business process, address the key issues of redundant development of data collection and processing software, and build a safe and reliable data collection and processing software system with excellent performance that facilitates electronic design and distribution of statistical survey programmes, incorporates functions such as uniformed data management, input, validation, edit and aggregation, is easy to operate, and that can accommodate various types of statistical surveys and achieve data sharing by different subject-matter departments. On its basis, a standardized, stable, user-friendly and highly performance statistical business application software system is built that can support statistical design, data collection, processing, storage, release and statistical analysis, and meet the needs of statistical agencies for census, regular and ad-hoc surveys.

D. Build the direct on-line reporting system

The direct on-line reporting system, based on informatization of hardware, data collection and processing software system and raw data base, allows respondents and enumerators to directly report the raw data to the National Data Center via the Internet through which statistical agencies at all levels share the data simultaneously on-line. The System is designed and built to allow data to be directly reported by around 3,000,000 enterprises to the National Data Center via the Internet and to guarantee a safe and smooth operation. Handheld electronic devices are widely employed to collect raw data for surveys that need direct collection of data, such as price surveys, agricultural output surveys, household surveys, labor force surveys, and population census. The data are transmitted in real time to the National Data Center via the Internet.

To sum up, the Big Four Projects allow the legal responding units in the business register of basic units, in light of the survey items set in the integrated business survey programmes, to directly report the raw data to the National Data Center via the Internet on a uniform data collection and processing software platform, and enable statistical agencies at all levels to receive, verify and share the raw data simultaneously on-line. Therefore, the Big Four Projects constitute an integral entity with interconnection, of which the business register of basic units is the foundation, the integrated business survey programmes is the core, the data collection and processing software system is the platform, and direct on-line reporting system is the means.

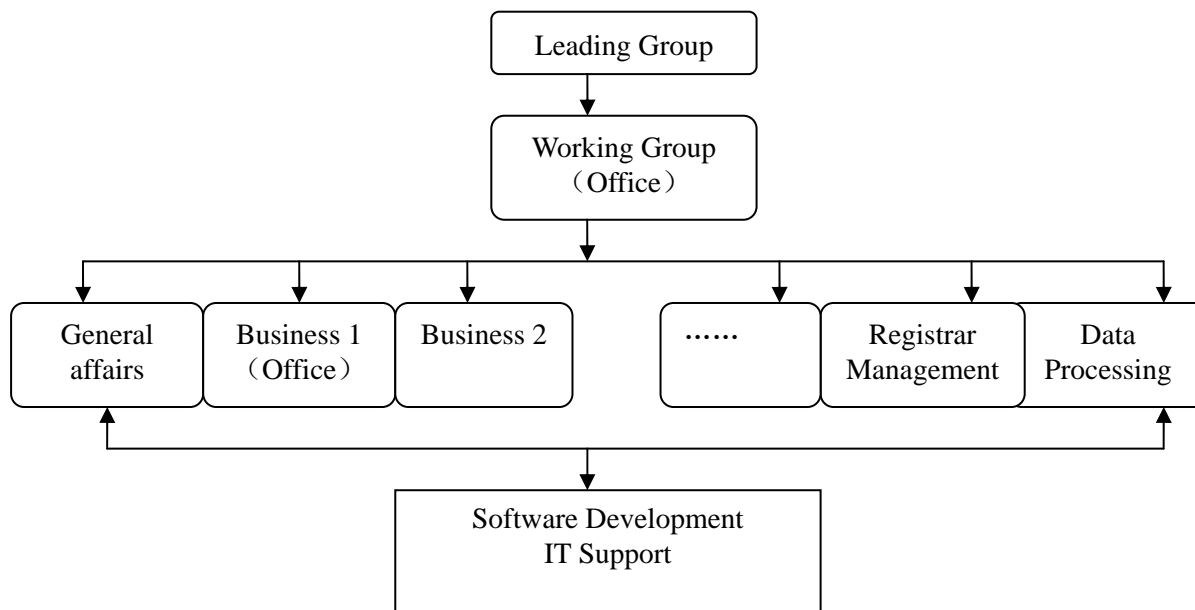
III. Practices of the Big Four Projects

In light of the concepts of integration which incorporates top-level design, resource integration and cooperative operation, the NBS (and statistical agencies at different levels) have taken a series of steps in areas of design of survey plans, management of responding units, standardization of statistical business process, software design and development, development of direct reporting system and organization and implementation of surveys. And the NBS has also conducted

targeted trainings and pilot operations to ensure the orderly progress of preparations and implementation of the Big Four Projects.

A. Strengthen organizational leadership, improve the working mechanism

The NBS has established a leading group and the working organization for the implementation of the integrated business survey programmes so as to strengthen organizational leadership and supervision. Local statistical agencies at different levels have established corresponding leading groups and working organizations, to act strictly in line with the centralized deployment of NBS and implement reform plans.



The main steps of organization and implementation include:

1. The competent local government leader acts as the head of the Leading Group;
2. The government issues official documents to support and promote the reform;
3. A notification letter on statistical legal affairs is delivered to enterprises, which clarifies responsibilities and obligations and aims to win their support;
4. Statistical agencies at different levels establish coordination units for general affairs, responsible for the coordination and organization of specific tasks;
5. Statistical agencies at different levels establish data appraisal and verification office in charge of data quality control.

Statistical agencies at different levels act in line with the unified deployment of the NBS and establish relevant working mechanisms for the implementation of the integrated business survey programmes. Firstly, establish the mechanism for identification of responding units and standardize the identification and update of the list of responding units for annual and intra-annual reports based on the business register of basic units, to ensure the “inclusion of statistical units into the Business Register of Basic Units prior to reporting”. Secondly, establish the mechanism of division and cooperation of

labor to regulate and specify the business process. Thirdly, establish the supervision system for outstanding issues to perform special supervision on the progress of the Big Four Projects and to understand the performance of each task in a timely manner.

B. Standardize the statistical operation process, identify responding units

Based on the information technology and by modern management means, the statistical business process is redesigned to realize the centralized management of survey programme design, data collection, data processing and statistical analysis, and standardization of business process and operational regulations, in order to ensure effective linkage of different steps of the operation and the automatic transmission of related data.

According to the requirement of “inclusion of statistical units into the Business Register of Basic Units prior to reporting”, responding units for the integrated business survey programmes are determined based on the business register of basic units. The NBS organizes provincial statistical agencies to identify the units for annual and intra-annual reporting on a regular basis to ensure the consistency and comparability of statistical data on different industrial sectors and from different survey programmes.

C. Strengthen top-level design, prepare uniform survey programmes and business plans

On the basis of statistical needs for business surveys, the NBS has formulated a set of core indicators for integrated business surveys and corresponding metadata standards and standardized the names, definitions, calculation methods, classification criteria, statistical coding and application requirements of the statistical indicators. Based on that, the NBS has designed in an integrated way the forms, statistical scopes, survey methods, survey frequency and reporting time of business survey programmes which result in a complete and convenient-to-use statistical survey system.

The NBS has also studied and formulated the business plan and related documents for the implementation of the integrated business surveys, including: overall design and implementation plans, uniform business survey questionnaires and plans, the system of core indicators for business surveys, main metadata standards, definitions of statistical units and application rules, statistical operation process and division of responsibilities, framework of needs for basic software functions, data auditing rules and compilation requirements, data processing plans, basic requirements for network and hardware environment, etc. Provincial statistical bureaus formulate the implementation plans for their own regions in line with the requirements in the national plans and documents.

D. Make full use of modern information technology, develop uniform software system and implement direct on-line reporting system

Relying on a standardized statistical business process, the NBS has developed a data processing software system for integrated business surveys, standardized data processing process and improved the accuracy, timeliness and sharing of statistical data in order to address the issue of redundant development of data collection and processing software and achieve data sharing among statistical agencies at all levels.

By use of a safe, smooth, convenient and efficient direct on-line reporting system, the NBS has organized in an integrated way the data collection which

facilitates enterprises to report the raw data to statistical agencies directly via the Internet, with aim to strengthen centralized management of original statistical data, effectively eliminate possible interference in the intermediate links and improve the efficiency of data processing and the transparency and controllability of data processing and production.

E. Attach importance to trainings, actively launch pilot operations

In line with the overall requirements of the Big Four Projects, statistical offices at various levels have formulated training manuals and provided targeted trainings on professional knowledge, business skills and computing software to different levels and on different subject matters for staff members, especially those at grassroots level. The NBS alone has organized three sessions of centralized trainings for 500 provincial statistical staff members.

The NBS has launched pilot work for four times at different levels and on different scales since 2009 in order to spot problems, sum up experiences and improve the plans. Specifically, the pilot work in 2009 and 2010 were targeted at the survey programmes, the implementation plans and the software system; that in 2011 was a whole-process pilot programme in two-thirds of the provinces prior to the official implementation of the Projects; and in mid-January 2012, the trial operation was launched in five provinces before the official launch of the direct on-line reporting system.

IV. Achievements of the Big Four Projects

The major achievements made since the implementation of the Big Four Projects are listed as follows:

A. We have basically established a business register of basic units that provides accurate and complete information and is timely updated

We have promulgated the "Implementation Rules of the Interim Administrative Measures for the Construction, Maintenance and Use of the Business Register of Basic Units in the National Statistical System", and established a working mechanism based on the business register of basic units, with uniformly identified responding units for annual and regular reporting. So far, a uniform database including 700,000 "three above" companies (industrial enterprises above designated level, wholesale, retail, hotel and catering enterprises above designated level and construction and real estate enterprises with designated qualifications) and real estate enterprises has been basically completed.

B. We have established a uniform and standardized system for integration of business survey programmes

We have sorted out all of the business survey sheets, initially established a system of core indicators and main metadata standards for integrated business survey programmes, unified the names, definitions, calculation methods, classification criteria and statistical coding of the same indicators used in different subject-matter departments, designed the electronic integrated business survey sheets and the industry-specific statistical statements that can meet the needs of "three above" businesses and real estate enterprises.

C. We have developed more convenient and applicable data collection and processing software

In accordance with the overall requirements for development of a uniformly compatible and user friendly software system with complete functions, and in connection with the actual needs of various subject-matter departments, we have organized the development of uniform software for application in different places. After several rounds of pilot tests and improvements, the data collection and processing software can basically meet the needs of statistical agencies at all levels for online collection, processing, aggregation, sharing and storage, with other functions such as review, revision and query.

D. We have established a safe and efficient direct on-line reporting system

We have broadened the bandwidth of the Internet gateway, expanded and updated system equipment, integrated and optimized the CA security certification system, and established the uniform national business direct reporting network system. Enterprises in 18 provinces submit data directly to the National Data Center via the Internet, and enterprises in 13 provinces submit data via the provincial data center, which will be acquired by the National Data Center in real time.

E. We have formed a strong legal support mechanism for statistics

We have established the notification system for statistical legal affairs and sent the notification letter to all enterprises engaged in direct online reporting; set up the rectifying and handling mechanism for appointment, supervision and tracking of violation cases, interviewed personnel involved in major violations of the law in online direct reporting; formed the information release mechanism for major violations of the law in statistics, with a dedicated column on the Chinese Statistical Information Network (<http://www.tjcn.org/>), and exposed two cases of false statistics.

V. Outcomes of the Big Four Projects of Chinese statistics

The decision to implement the Big Four Projects is based on the current situation of statistics in China. The NBS actively learns from the advanced concepts of integrated statistics from the outside world, makes full use of modern information technology, and after a certain period of implementation and operation, has basically achieved the expected goal.

A. Ease the burden on the grassroots statistical agencies and the respondents

In order to meet the growing demands by the Government and the public for statistical data, the NBS has witnessed a growing number of governmental statistical programmes and greater details in survey content. By means of traditional statistical production, subject-matter departments of NBS collect and compile data separately, leading to data overlapping to some extent and growing workload for grassroots statistical agencies and responding enterprises. By implementing the Big Four Projects, we will unify and standardize the survey system and make it easy to use. The NBS organizes data collection, and the statistical agencies at different levels obtain the raw data directly via the Internet for further processing, which can avoid repeated data submission by responding units and reduce the duplication of labor inside statistical agencies.

B. Better Integrate the statistical work with modern information technology

Through the Big Four Projects, we will standardize and unify the scope of respondents, definitions of statistical indicators, classification criteria and statistical business process, as all staff members engaged in the process need to act in line with the general requirements on standardization. Through the Projects, we will adopt the electronic and network technology in the whole statistical process by making full use of computers, database, the internet and metadata standards in the process such as design, collection, processing, analysis, release and dissemination.

C. Further enhance official statistical capacity

Statistical capacity depends on the working efficiency to some extent. Through the implementation of the Big Four Projects, we have put an end to the traditional data collection method, and managed to “conduct one survey programme and use the results for multiple times”. Meanwhile, we have realized centralized management of data, share of information, unified maintenance and whole-process support, to maximize the effect of statistical tasks and greatly improve the statistical capacity.

D. Further improve the statistical data quality

Through the implementation of the Big Four Projects, we have collected the basic data from enterprises in a comprehensive, systematic, standard, and unified way, and general data of all kinds are more consistent and comparable, which lays the foundation for making the statistical data more relevant. By means of online direct reporting, enterprises directly report the basic data about production, sale and investment to the NBS, which has not only streamlined the statistical production process, but also improved the timeliness of statistical data and the accuracy of original data. The new production method has reduced not only the cost of statistical departments, but also the statistical workload of enterprises. We have gained more yields with less input, with statistical data becoming more effective.

E. Further increase the government statistics credibility

The government statistics credibility is about how much the general public trusts us. Through the implementation of the Big Four Projects, we have been able to make the statistical business process more standardized and transparent. Where do the national data come from? How are they produced? How can we use the statistical data? The general public will find immediate answers to these questions and thus will understand, trust and support the statistical work.

VI. Prospects

This is only the first step in the long journey of the construction of the Big Four Projects. In the next stage, we will, on one hand, keep improving the existing business register of basic units, integrated business survey programmes, software platform, and direct on-line reporting system; on the other, gradually expand the application of the integrated business survey programmes via direct on-line reporting system to all business surveys, including those on “three below” enterprises, major service industries and the Producer Price Index for Industrial Products. Meanwhile, we will conduct in-depth research on the processing and production methods of statistical data; learn to process and produce raw statistical data on the basis of modern business management system;

learn to make better use of the administrative records by deriving statistical data from administrative sources such as industry and commerce administration, taxation, etc.. We will actively explore more service functions of the direct on-line reporting system, endeavor to provide enterprises with domestic and international macro-economic information, business operation information and statistical consulting services so as to win greater support from them.

There has been fundamental changes in the statistical business process since the implementation of the Big Four Projects, which require an adjustment of organizational structure and functions to the existing statistical business process. We will examine the working patterns followed during the implementation of the Big Four Projects and explore an organizational pattern suitable for integrated business survey programmes via direct on-line reporting system. Grassroots statistical agencies, in particular, need to give more emphasis of their work to seek and verify information in the business register of basic units, guide enterprises to consolidate their foundation by establishing statistical ledger and original records, and to verify the data submitted by enterprises by summarizing experiences from the implementation of the Projects.
