

Distr.  
GENERAL

WP.14  
14 April 2010

ENGLISH ONLY

**UNITED NATIONS ECONOMIC COMMISSION  
FOR EUROPE (UNECE)  
CONFERENCE OF EUROPEAN STATISTICIANS**

**EUROPEAN COMMISSION  
STATISTICAL OFFICE OF THE EUROPEAN  
UNION (EUROSTAT)**

**ORGANISATION FOR ECONOMIC COOPERATION  
AND DEVELOPMENT (OECD)  
STATISTICS DIRECTORATE**

**Meeting on the Management of Statistical Information Systems (MSIS 2010)**  
(Daejeon, Republic of Korea, 26-29 April 2010)

Topic (iii): Issues for Asian statistical organizations and ways to increase international cooperation

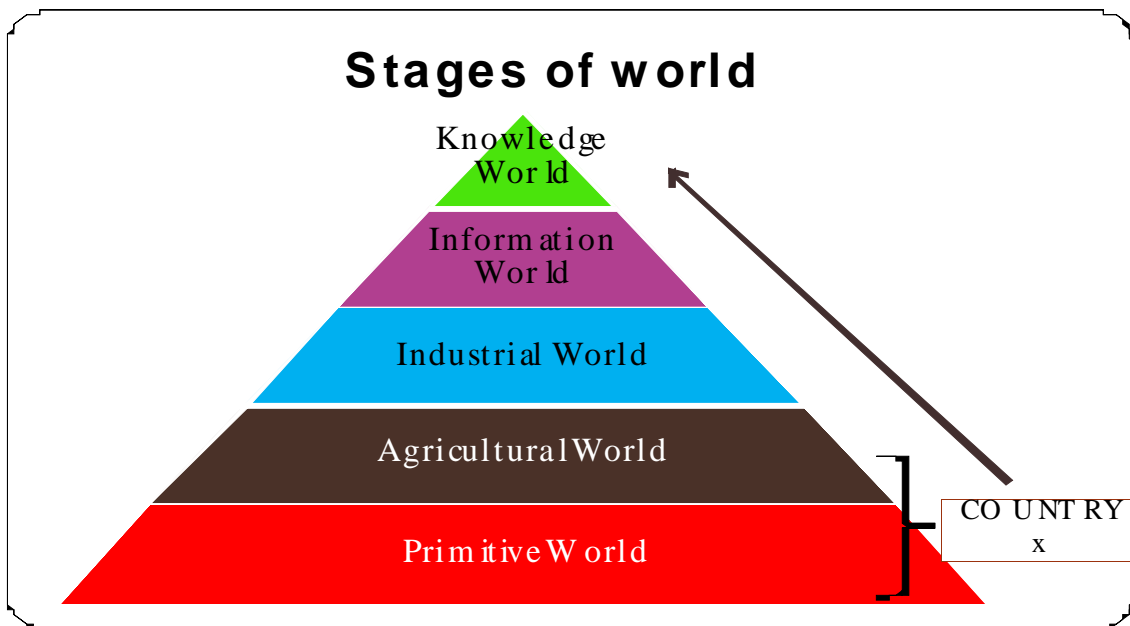
## **Internet data collection system**

Prepared by Ugyen Tenzin, Department of Employment, Bhutan

### **I. Introduction**

1. In today's world we are faced with situations everyday where statistics can be applied. Statistics can be used to determine the potential outcome of thousands of things where the human mind alone wouldn't be able to. The most important aspect of development at this stage is information. Decades ago development of a country fully dependant on industrialization but now a country can be easily developed with the analytical and statistical methods. For example: If a more understandable and accessible statistical information is provided to the decision makers and planners, they will make ample plans according to the information. With statistics we can determine how we will live a year from now, ten years from now, and so on. This is important because if we didn't have data from the past to look upon, we wouldn't be able to prolong our existence by avoiding recurring climate changes, economic downturns, etc.

2. The diagram below presents the stages of the world. It starts with the Primitive World and goes up to the knowledge world. Most developing countries in Asia are still in the first phase of the world i.e. the Primitive World and Agricultural World. And if it is to go by the level of stages, then most Asian's countries will take decades to be developed. But there is still hope that these Asian countries with the help of good source of statistics can directly jump to the Information World and then the Knowledge World skipping the Industrial World.



3. The Labour Market Information Division of the Department of Employment, Ministry of Labour and Human Resources in Bhutan who looks after the labour market situation in Bhutan and who is also the sole agency responsible for the labour force surveys and establishment censuses has developed a lot of information dissemination tools and methods for interacting a good communication with the various stakeholders.

4. One of our very most important examples is the Labour Market Information System. This web based data sharing system presents all the information that we collect from surveys and censuses along with the administrative records that we collect manually. The advantages of this system are that data's are updated frequently and contains a lot of other important information related to labour market from various stakeholders which can be viewed from anywhere within a few clicks. The main objective for developing the system was to provide accurate, reliable and timely information on:

- Employment by nationality
- Unemployment
- Vacancies
- Future demand and supply of labour force by nationality/skill levels
- And to enable management and the decision makers to make policy and programme adjustments in the areas related to labour administration, employment promotion and training delivery.

5. The other important resources that we provide is the biannual labour market information bulletins/reports and labour market brochures. These bulletins/reports are developed in a very simple way with easy to understand charts and tables with simple interpretation and analysis of tables so that students and ordinary people can understand the labour market situation in the country. Apart from these simple reports, we do have our annual survey reports.

6. Then the division keenly takes interest in providing labour market statistics to students and teachers in schools. The division usually presents a power point presentation on the basic labour market statistics whenever invited by the schools and the Ministry of Education to Career Counselor teachers in schools.

## **II. Development of LMI-System**

7. The winning bidder has to develop a system based upon the requirements of the LMI Division. The detailed description of the work and scope of the system is clearly indicated in the requirement definition document (see annex).

## Annex: Requirement Definition Document

### Scope of the System:

#### 1) Input for the LMI-System

##### A. Department of Labour

- i. Number of foreign workers at any given time: (labour net/database on foreign workers)
  - a. Location wise (dzongkhag, region etc...)
  - b. Gender wise
  - c. Occupation wise
  - d. Age wise
  - e. Employer wise
  - f. Sending country/state wise etc.
  - g. Any other information related to foreign workers
- ii. Information related to labour administration (nationals/foreign workers)

##### B. Department of Employment

- i. Job seekers
- ii. Job vacancies
- iii. Job placement status
- iv. Number of job referrals

(Source of data: job portal and records from Employment Services Division)

- v. Information from Establishment survey/ census
- vi. Labour Force survey reports

##### C. Department of Human Resources

- i. Enrollment by trade/occupation, gender, vocational training institutions (public and private)
- ii. Number of graduates/certificates by trade/occupation, gender, vocational training institutions (public and private)
- iii. Number of Instructors in institutions (nationality wise, educational level wise etc...)
- iv. Number of dropouts by age, course, institution and gender wise
- v. Tracer study report on career, done by vocational institutes

##### D. Department of Occupational Standards

- i. Accredited training institutions and programmes
- ii. List of occupational profiles
- iii. List of certified workers by level of skill competencies, by gender
- iv. List of certified Assessors and Assessment centers

##### E. Ministry of Economic Affairs/Bhutan Chamber of Commerce and Industry

- i. Number of Business establishments by economic sector at any given time:
  - a. Location wise (dzongkhag, gewog etc.)
  - b. Size wise
  - c. Employee and employer wise (type of jobs, national, foreign workers etc.)

##### F. Ministry of Education

- i. Future enrollment forecast of students/ graduates by class and field of study
- ii. Number students enrollment at any given time:
  - a. Dzongkhag wise, gender wise, school wise and class wise, etc.
- iii. Number of graduates from all schools within and outside the country at any given time:
  - a. Dzongkhag wise, school wise, gender wise and class wise etc.)

- b. Field of study
- iv. Number of schools (location wise)
- v. Number of teachers in schools (nationality wise, educational level wise etc...)
- vi. Number of dropouts by age, class, school, and gender wise

#### **G. Royal University of Bhutan**

- i. Number of students/trainees enrollment at any given time:
  - a. Gender wise, course wise, institution wise, etc.
- ii. Number of graduates from all institutions under RUB at any given time:
  - a. Gender wise, course wise, institution wise, etc.
- iii. Number of teachers/lecturers in institutions (nationality wise, educational level wise etc...)
- iv. Number of dropouts by age, course, institution and gender wise

#### **H. Royal Civil Service Commission**

- i. Civil servants by field of study and gender
- ii. Job vacancies by occupation
- iii. Job placement status by gender, field and occupation

#### **I. National Statistical Bureau**

- i. Population indicator
  - a. Gender wise
  - b. Age wise, etc.
  - c. Area of residence wise (Urban, Rural)

### **2) Expected output (reports) from the LMI-System**

#### **A. Department of Labour**

- i. Information on wages for National and Foreign workers
- ii. Number of existing Foreign workers workforce with specific skills
- iii. Ages of labour force to capture the existence of child labour
- iv. Number of workers on contract and number of workers terminated with reasons
- v. Demand for foreign workers workforce by occupation and level of skills

#### **B. Department of Employment**

- i. Number of employed by gender, location, education level, type of job and skills
- ii. Number of unemployed by gender, education level and skills
- iii. Job vacancies by occupation, location, education level and skills
- iv. Demand for foreign workers by gender, level of education/skills
- v. Information on special groups-physically challenged and disadvantaged
- vi. Future demand of work force by occupation, level of skills, economic sector and by gender
- vii. Future demand for skills by field of study, level of skill competency

#### **C. Department of Human Resources**

- i. Number of trainees undergoing training by field of study, institution, level, gender
- ii. Number of VET graduates employed and unemployed by occupation and gender
- iii. Training opportunities in-country and abroad for pre-service and in-service
- iv. Opportunities for higher studies both in country and abroad
- v. Number of youth in vocational training by field of training and skills competency level

#### **D. Department of Occupational Standards**

- i. Information on type of occupation in the economy by level
- ii. Occupations held by foreign workers by level of skill competency
- iii. Number and type of qualifications not yet certified

**E. Ministry of Economic Affairs/Bhutan chamber of Commerce and Industry**

- i. Information on the total number of establishments by location, by capital invested, by economic activity, by number of employee wise.

**F. Ministry of Education:**

- i. Information on the future enrollement forecast of student by class and field of study.
- ii. Information on the number of students enrollement by location, school wise, gender wise and class wise.
- iii. Information on total number of schools.
- iv. Information of total number of teachers in schools by gender, educational level and nationality wise.
- v. Information on number of dropouts by class, school and gender wise.

**G. Royal University of Bhutan:**

- i. Information on the future enrollement forecast of students/trainees by class and field of study.
- ii. Information on the number of students/trainees enrollement by location, institution wise, gender wise and class wise.
- iii. Information on total number of institutions.
- iv. Information of total number of lecturers in institutes by gender, educational level and nationality wise.
- v. Information on number of dropouts by class, institute, field of study and gender wise.

**H. Royal Civil Service Commission:**

- i. Information on the total number of civil servants in the country by field of study, qualification, gender and location wise.
- ii. Information on the job vacancies in the government system by occupation.

**I. National Statistics Bureau:**

- i. Information on the total number of persons in the country by age, gender, area of residence.

**J. Tourism Council of Bhutan:**

- i. Information on the total number of guides in the country by level of training, qualification and major occupation.
- ii. Information on the future forecast for requirement of persons to be employed in the Hospitality sector.

**3) Other requirements****A. Screen Enquiries**

- i. All information have to be available on screen
- ii. Users must be able to move quickly between the various sets of information, when in a call center situation

**B. Reports and Standard Letters**

- i. Standard reports analyzing the supply and demand of labour etc... in the market have to be generated as and when needed. It have to be flexible enough to sort a variety of criteria, meaning it have to be customizable
- ii. The system shall include a report writer function/ Query Builder, so that new ad hoc reports can be prepared at any time

- iii. All Reports have to have all headings and columns well defined
- iv. Creation of reports using Crystal Report makes the reports printable in Graphics format, which takes long time. In order to make fast print outs, options have to be made available to print any report in both the text and graphics format

#### C. Consistent Interfaces

- i. All the forms have to be consistent. The forms will have standard set of command buttons (hotkeys, screen resolutions etc). The functionality of all the command buttons have to be similar in size and shape. Labels and position of the buttons have to be same in all the forms

#### D. On Line Context Help

- i. Detailed help have to be made available online. In cases of complicated procedures the help have to specify the manual process to assist the user to complete the action

#### E. Data Security and consistency

- i. All database validations; consistency checking and security have to be implemented at server side (no hard-coding)

#### F. Keyboard Input

- i. Operation of all input forms have to be possible through keyboard with minimum use of mouse

### 4) Proposed Development Environment and Procedures

A. Based on our requirement we would like to propose the following platforms, procedures and classification of system configurations:

- i. A 2-tier client server system namely: the client that executes the “display control,” and database server that handles “data access” and the “application logic,”
- ii. DB server OS: win 2003/Unix- Solaris/free BSD
- iii. Web server: apache, Application language: PHP, Database: MS SQL
- iv. Report Writer: crystal report 9 or above

B. The **schedule sheet**, defining the system development plan is attached herewith. The counterpart will ensure the vendor **go by the schedule plan** and prepare weekly progress report in order to complete the system in time by 31<sup>st</sup> August 2005. While strictly adhering to the system development plan the vendor must also come up with the DFD at different levels and system design sheets.

- System Planning (creating system development plan/project management plan)
  - Schedule sheet attached
- System Analysis (understanding the specifications of the LMI-System, design business procedures and confirm required specification)
  - DFD (Data Flow Diagram, at least up to level 2 including context diagram)
- System Design (standardize rules for well-standardized LMI-System)
  - According to the user requirement analysis, determine necessary functions and create each of the following documents.
    - System Concept sheet
    - Structure Map
    - Directory Structure Map
    - Database Design sheet
    - Table Specification sheet
    - Interface Design sheet

- Program Specification sheet
  - Input/Output Specification sheet
  - Naming Rule sheet
  - Message List
  - Trouble sheet
- 
- Server Creation (setting up server environment)
  - Test Design
    - Considering the Program Specification sheet created above, design test specification must include the following test sheets:
      - Unit Test Specification sheet
      - Integration Test Specification sheet
  - Programming (based on the specification designed, develop the system)
  - Unit/Integration Test
    - Along with the test specifications created, perform both UT and IT. For any identified bugs, create a Trouble sheet to describe them.
  - Operation Test
    - Prepare the environment for implementation. Confirm the adequacy of the system by pre-implementing. Also, shift and transfer the systems and business tasks.
-