

Use of IT in Singapore Department of Statistics - Initiatives in the 2000s

To meet the increasing demand for better and more timely data and services from policy makers and general public, DOS embarked on a number of initiatives to improve the process of data collection and dissemination by making strategic use of advances in technology.

Data Collection and Data Processing

Census of Population 2000

In 2000, Singapore conducted its first register-based Census of Population. The register-based approach to Census 2000, supplemented by a large-scale survey, marked a watershed in the history of Census taking in Singapore. For the first time since 1871, information was no longer collected from the entire population. Basic demographic information was sourced from administrative registers while additional data required for in-depth studies were collected from a sample of the population.

For the sample enumeration, a tri-modal collection strategy, integrating the Internet, Computer Assisted Telephone Interview (CATI) and fieldwork, was adopted for the Census of Population 2000. This multi-modal strategy facilitated the conduct of the Census and optimised the operations, in terms of costs, manpower and convenience to different groups of the population.

General Household Survey 2005

In the 2005 General Household Survey (GHS 2005), the Department built upon the experiences of the Population Census 2000, combining a register-based approach with a large-scale sample survey.

For the sample enumeration, the GHS 2005 adopted the tri-modal data collection strategy, incorporating lessons learnt from Population Census 2000. A key innovation in GHS 2005 was the use of Personal Digital Assistants (PDAs) in the face-to-face interviews.

The deployment of PDAs in the fieldwork instead of paper forms was one of the key improvements in data collection strategy in GHS 2005. Questions, response options, branching algorithm and completeness checks were built into the PDA. The branching algorithm in the PDA guided the interviewer in the conduct of the interview and ensured that respondents answer only the relevant questions. As on-line completeness checks were carried out with the PDA, respondents were also

less likely to be called or revisited by the field interviewer to provide information on questions that were inadvertently omitted.

The removal of form scanning and data entry of fieldwork returns in office from the workflow resulted in saving in time and manpower for data processing. Potential errors of transcription from hard copy form were eliminated. In addition, with the use of PDA, fieldwork operations were further simplified as there was no need for printing of partially collected data on paper forms.

Household Expenditure Survey 2007/08

With the experience from the GHS 2005, the PDAs were adopted again for field collection in the Household Expenditure Survey 2007/08 (HES 07/08) to reap the benefits of the technology.

Integrated Business Survey System (IBSS)

In 2008, the Department embarked on the development of the Integrated Business Survey System (IBSS), an integrated end-to-end survey system covering the survey processes of survey set-up, survey administration, data collection, data editing, imputation, evaluation and compilation for DOS' business surveys. The IBSS is an innovative survey system designed to improve the effectiveness and efficiency of the survey processes through harnessing technological advances and adopting the best practices of established National Statistical Offices (NSOs).

The desired outcome of the IBSS is to make available more detailed business survey data and better quality economic indicators for services industries/clusters which are important for agencies and businesses for their industry/cluster monitoring, policy planning and research purposes.

A multi-modal data collection and data capture strategy will be adopted in the IBSS. To cater to different groups of survey respondents with wide diversity in technological aptitude and capability, the IBSS provides for the submission of survey returns via the internet or mail. To facilitate data capture, the Intelligent Character Scanning (ICR) technology is used to capture data from hardcopy survey returns more efficiently, in addition to conventional data entry.

In the area of data processing, DOS makes use of the software on outlier detection, imputation and compilation developed by Statistics Canada which provides a wide range of well-established statistical methods on outlier detection, imputation and compilation to improve data quality and timeliness.

Census of Population 2010

Leveraging on the success and lessons learned from the Census 2000, the Census 2010 adopted a register-based approach and employs a tri-modal data collection strategy comprising Internet enumeration, CATI and field work to facilitate data collection for the households in the census sample.

The Ultra-Mobile Personal Computer (UMPC) is used in the field collection in Census 2010.

Data Dissemination

In the area of data dissemination, the SingStat website (www.singstat.gov.sg) was positioned as a statistical portal providing Singapore official statistics compiled by DOS and other government agencies. This website also contains links to overseas statistical agencies and international organizations. With effect from June 2006, DOS publications have been made available for free access via SingStat website. Since its launch in 1995, the SingStat website has undergone continuous enhancements and revamps in contents and navigation aspects to better serve our data users' needs. The latest revamp was completed in July 2007.

In 2004, DOS launched the internet-accessible time series system, SingStat Time Series (STS) Online to replace the remote dial-up system. The STS presently includes more than about 7,000 statistical time series on Singapore society and economy from several domains, including national accounts, balance of payments, investments, finance, labour, prices, business expectations, trade, manufacturing, tourism, demography, health and education. With an easy-to-use search engine and personalized portals accessible via the internet, STS subscribers could search, select and retrieve important, timely and relevant time series data.

Data users can subscribe to "Singstat Express" service, which emails to the subscribers press releases and notifications of new publications by DOS as soon as they are released. SMS alert is available for local users.

DOS also offers the Really Simple Syndication (RSS) service to keep users updated on the latest statistical news released via the SingStat website. The SingStat RSS delivers statistical news highlights and hyperlinks to the source documents whenever the updates are posted. Such alerts are delivered in an XML file called the RSS feed or RSS channel.

As part of DOS' continuous effort to provide multi-channels dissemination service, a free mobile service, "Data on SMS" was launched in 2008. Local users could retrieve the latest data for key indicators via sms through this service.

Major Milestones in the 2000s	
<i>Date</i>	<i>Statistical Activity</i>
2000	• Singapore's first register-based Census of Population was conducted.
2001	• All Special Data Dissemination Standards (SDDS) requirements at the time of subscription were met for Singapore. • The SingStat Express email notification service and the SingStat DataShop@GovMall were launched.
2002	• The Statistics Singapore website was revamped, incorporating navigation features and a portal approach for quick and convenient access to Singapore statistics for users.
2003	• Customized survey forms for the monthly Producer Prices Surveys were disseminated automatically through the use of the Department's Lotus Notes email system.
2004	• The SingStat Express service was enhanced and SMS notification was provided. • The reporting format for the services account in Singapore's Balance of Payment was expanded. • DOS launched the internet-accessible time series system, SingStat Time Series (STS) Online to replace the remote dial-up system, TREND.
2005	• The General Household Survey 2005, which adopted the use of Personal Digital Assistants (PDAs) in data collection for the first time, was conducted.
2007	• PDAs were deployed in the conduct of the Household Expenditure Survey 2007/08. • The Statistics Singapore website was revamped, featuring new search facilities, enhanced navigation features such as "Themes", informative content such as "Educational Corner" and more services including the Really Simple Syndication (RSS) feeds. • The Intelligent Character Recognition (ICR) was implemented in selected business surveys as ICR Pilot Run.
2008	• The "Data on SMS" mobile service was launched to serve the needs of data users on the move and need key statistics quickly at anytime of the day.
2010	The data collection module of the Integrated Business Survey System (IBSS) was implemented for establishment surveys. The IBSS is an innovative survey system designed to improve the effectiveness and efficiency of business survey processes through harnessing technological advances and adopting best practices. Singapore's second register-based Census of Population was conducted with the use of Ultra- Mobile Personal Computers (UMPCs) in fieldwork data collection.