

**United Nations Statistical Institute for Asia and the Pacific
Sixth Management Seminar
for the Heads of National Statistical Offices in Asia and the Pacific
28 - 30 May 2007, Hong Kong, China**

Managing Information Technology for Statistical Development

Country Paper - Hong Kong, China

Introduction

As in many national statistical offices, information and communication technology (ICT) plays an increasingly important role in the core businesses of the Census and Statistics Department (C&SD) of the Hong Kong Special Administrative Region (HKSAR), enabling the Department to meet its strategic goals more efficiently and effectively. Advances in ICT continually present new opportunities for statistical initiatives and developments. Properly steered and managed, they lay the foundation for milestones and breakthroughs in the continual pursuit of the Department's missions.

The C&SD is implementing a series of ICT-based transformations in its statistical services and organisation of operations. More prominent amongst these include moving towards greater adoption of department-wide common platforms, standards and tools; more user centric e-services; and greater knowledge sharing and collaboration. A number of these transformations are spurred by the recommendations of the Information Systems Strategy Study (ISSS) conducted in 2003-04.

This paper describes the IT governance and management framework of the C&SD, followed by a discussion of how ICT is managed for enhancing statistical development, IT management challenges and the role of the central government in promoting ICT in bureaux and departments (B/Ds) of the Government of the HKSAR.

The ICT Governance and Management Framework in C&SD

Harnessing technological advances in pursuit of corporate mission requires strategic vision and direction at top management level, appreciation by senior business users of new opportunities made available by technological advances as well as understanding and sharing of business goals and challenges by IT professionals. The C&SD has enhanced its

IT governance and management structure to enable more strategic steering of department-wide IT developments and initiatives and ensure that these are best aligned with business goals as well as to better support the implementation of various strategic IT applications and maximise the benefits from exploiting opportunities accorded from the continual advances in ICT.

The overall IT direction of the C&SD is steered by the departmental IT Steering Group (ITSG), which is headed by the Deputy Commissioner and comprises all Division Heads (Assistant Commissioners) as members. The ITSG also makes strategic IT decisions that have department-wide implications on different subject areas in the C&SD. Supporting the ITSG are the IT Management Unit (ITMU) and IT User Working Group (ITUWG). While the ITMU is responsible for overseeing IT management and planning, the ITUWG provides a platform for end-users to participate in the planning of IT development in statistical work and for the ITMU to regularly communicate IT directions with end-user representatives and ensure the alignment of IT developments with business objectives.

On the management of individual IT projects, a Computer Applications Co-ordination Group (CACG) is in place to examine all project proposals and endorse them where deemed appropriate, and ensure that business objectives are realised when the projects are fully implemented. For each IT project, project governance is undertaken by a Project Steering Committee (PSC) while day-to-day project management is taken up by a Project Assurance Team (PAT), both of which comprise business users and IT professionals working on the project. Important project issues, particularly those with implications on department-wide IT strategy and practices, are communicated to the ITMU, the ITUWG and ultimately the ITSG for central co-ordination.

These core establishments work closely together to facilitate more centralised management of the departmental IT developments and ensure the alignment of these developments with business needs and the overall government IT strategy.

Managing ICT for Enhanced Statistical Development

Meeting increasingly sophisticated user demands with enhanced service offerings

Advances in ICT have significantly changed the landscape of what can be achieved by National Statistical Offices (NSOs) in delivering statistical services and what is expected by data users (including government departments, private companies, academic and citizens in general). The increasing penetration of computers and the Internet into

corporations and households has undoubtedly raised the expectations of data users. Not only do users demand more detailed and timely statistics, they have grown to expect more sophisticated online services such as intuitive e-reporting and interactive table building.

On the side of NSOs, ICT advances have created new opportunities in reducing delivery time, providing customised, user centric and friendly services, improving customer relationship, and ultimately better promoting more informed decision making and statistical literacy. The e-government programmes pursued by different governments have also contributed to the development of e-service initiatives by their respective NSOs which are often stimulated by international benchmarking undertaken by data users, NSOs or both.

Meeting sophisticated user demands while exploiting new ICT opportunities presents challenges in designing services that meet user needs, achieving cost-effectiveness in delivering these services, as well as sustaining the service advantage. One key challenge in delivering e-services is to reach a critical mass which is crucial for cost-effectiveness and service sustainability. While this may not be difficult in data dissemination, online data reporting is a different story. The recently revamped C&SD website has made significant headway in developing a user centric website with Customer Relationship Management (CRM) tools (e.g. e-mail notification and personalised webpages) to enhance relationship with online data users while the online PDF e-questionnaire solution adopted for the 2006 Population By-census has provided a user friendly e-reporting solution and has been relatively cost-effective compared to full-fledged online solutions.

Developing department-wide common platforms and tools to enhance statistical operations

Besides user focused e-services, advances in ICT have also created opportunities for enhancing in-house statistical processes such as data capturing, data editing and validation, data analysis and compiling tabulations as well as preparing publications and reports. Significant economies in resource sharing and staff training can be gained from deploying standardised and department-wide platforms/tools for processes such as data capturing and output production, common statistical and On Line Analytical Processing (OLAP) tools for data analysis, and shared libraries of data validation programs that can be customised for different survey systems. A number of such department-wide initiatives are currently underway in the C&SD such as the development of a common

data processing and analysis platform, an imaging centre for survey questionnaires, an enhanced computer-assisted telephone interviewing centre and a common output production platform.

Supporting the development of a knowledge sharing and collaboration environment

In today's knowledge driven society, efficient and effective knowledge sharing and workspace collaboration are increasingly important both for government organisations and private companies. While it is essential to create an environment that fosters knowledge sharing and contribution, it is equally important to use innovative ICT solutions that facilitate the capturing, harvesting, searching and distributing of corporate knowledge across an NSO. A major initiative currently underway in the C&SD is the development of a Knowledge Management Support System which will provide the necessary infrastructure to support the development of knowledge management activities and processes.

Specialisation and demarcation of responsibilities in the management of IT resources

In the C&SD, ICT resources are mainly managed by two IT Branches (ITBs), each headed by a Senior Statistician. ITB(1) comprises mainly IT professionals and a few business users and oversees the IT infrastructure of the C&SD, application systems developed by IT professionals, C&SD Website and e-service offerings as well as providing technical support for all department-wide systems. ITB(2) comprises entirely of business users and plays the role of a business analyst, coordinating the implementation of the ISSS initiatives, overseeing the development of end-user applications and practices as well as security related matters. Given their clearly defined responsibilities, the present set-up provides flexibility for each ITB to undertake technology surveillance in its respective business areas and propose strategies to respond to changes which are deliberated at the ITSG and ITMU to ensure alignment with business goals and priorities.

Empowering business users to lead IT projects

All IT application projects are owned by key business users with the respective ITBs providing technical support and business analyst support. Key business users play a crucial role in the Project Steering Committee of the respective project. Having business

users assuming ownership of IT projects is highly conducive towards ensuring that projects' deliverables can fully and truly meet business needs.

Central Government Support

Driving ICT and e-Government Strategies

The Office of the Government Chief Information Officer (OGCIO) provides leadership for the development of ICT within the Government of the HKSAR, focusing primarily on the establishment of ICT policies, strategies, programmes and measures. A high-level E-Government Steering Committee is in place to set the strategic direction of the overall e-government programme and coordinates inter-agency implementation. In developing IT strategies for the C&SD, the ITSG ensures that these departmental strategies are aligned with the overall government-wide ICT strategies.

Promoting and providing an environment for leveraging latest technologies

The OGCIO advises B/Ds of the Government of the HKSAR on the use of information technology to improve service quality and operational efficiency. Resource and solution centres as well as appropriate mechanisms (e.g. publications, thematic campaigns and promotion events) are in place to provide B/Ds convenient access to latest technologies and products as well as opportunities for collaboration with the IT industry and the academia for developing advanced business solutions. In addition, training courses and workshops are frequently arranged for ICT-related skills and knowledge for both IT professionals and end-users.

Provision of government-wide IT infrastructure and services

The OGCIO provides government-wide IT infrastructure, applications and services to facilitate B/Ds in the efficient and effective delivery of services to their users, both internal and external. These include government-wide networks, application hosting centres, data centres, disaster recovery centres, Internet gateways, interactive e-services hosting platforms, etc. To streamline the procurement of ICT products and services, special contractual arrangements with short-listed vendors are in place for the supply of hardware/software and IT services. The provision of centrally managed infrastructure and

contractual arrangement saves substantial administrative cost, creates economies of scale and enables B/Ds to focus on managing their core businesses.

Establishment of Standards and Methodologies

The OGCIO has established a set of ICT standards and methodologies to facilitate B/Ds in technology deployment and development of business applications and e-services. These include methodologies in project management, software development, quality management as well as an IT security management framework. To facilitate the development and implementation of joined-up e-government services, a set of interoperability standards (based on international standards) has been developed for system interfacing. Using these standards and guidelines as a base, B/Ds can develop their own sets of standards and guidelines that best serve the needs of the individual B/Ds. For outsourced projects, these standards and guidelines serve a very useful purpose in stating the “rules of the game” and the expectations of the Government and the B/Ds, thereby ensuring that contractor and B/Ds can co-operate in a more effective manner.

ICT Project Funding and Benefits Realisation Measurement

The OGCIO is accountable for the Government's investment in ICT. Being the fund controller of all project under HK\$10 million (around USD 1.3 million), the OGCIO has the mandate to prioritise and approve project funding bids initiated by the B/Ds and also oversees the delivery of project benefits. For major projects exceeding HK\$ 10 million, these are directly approved by the Finance Committee of the Legislative Council with annual progress reporting mechanism. To improve the management of ICT investments, the OGCIO has recently established a framework to facilitate B/Ds in formulating business cases for ICT investments which will serve to better align ICT investments with business objectives, enhance the articulation of the benefits of such investments and monitoring of the delivery of these benefits.

IT Management Challenges

Designing user centric e-services

In delivering user friendly e-services, user needs and preferences should be collected and

understood, lest the e-service falls short of user expectations. User centric e-service delivery is an ongoing endeavour and requires continuous monitoring of changing user needs and preferences which provide stimulants to refining, modifying or even revamping existing service offerings. The C&SD has started to use focus group interviews and pre-launch demonstrations of prototypes with selected target groups to ensure that e-services delivered can be as close to meeting user needs as feasible and practicable. Online feedback forms have also been recently introduced to gauge customer comments upon roll-out of these e-services. Participation and feedback have been encouraging and the C&SD plans to further step up activities in this area.

Managing the variety of data users and their different needs and preferences for data and statistical service is another challenge in e-service delivery. Instead of a “one design for all” website, the C&SD has set up dedicated corners on its website for specific user groups with customised and tailored contents geared towards the needs of these users (such as students, traders, media workers and survey respondents). For data users which constitute the major user group of the C&SD Website, a thematic presentation approach has been adopted whereby all statistical contents (e.g. latest statistics, detailed statistical tables, publications, press releases and glossary of terms) pertaining to a subject area (e.g. Population and Vital Events, Labour, Prices, and External Trade) can be accessed from a single webpage, facilitating data users in searching for statistical information on selected subject areas. Database publishing techniques and content management tools have significantly streamlined the development of such website designs and content deployment.

Besides dedicated user corners, as part of CRM activities, the C&SD provides a free user registration service which allows registered users to enjoy value-added services such as e-mail notification in selected subjects of interest, personalised webpage, saving customised tables for convenient future reference and setting bookmarks to frequently accessed pages on the C&SD Website. So far, the response has been positive and over 2000 users have registered for this service. The deployment of appropriate web technologies and the new hosting platform for dynamic web content provided by the OGCIO has made it possible to deliver such customised services.

In essence, the key objective in designing user centric e-services is “creating a value proposition” with ICT being an enabler to deliver this “value proposition” efficiently and effectively to users.

Change Management

As discussed, ICT developments for in-house statistical processes will focus very much on the set-up of department-wide platforms for shared use in all subject areas. Such migration, as in the case of the knowledge management support system, can mean significant departure from the existing mode of operation. Owing to various reasons such as being highly accustomed to existing mode of operation, not fully perceiving the benefits of department-wide platforms, conflicting priorities or lack of resources, less than whole hearted support for such developments can sometimes be experienced. To ensure that existing applications and processes can be successfully migrated to the new department-wide platforms, a change management programme is indispensable. Subject matter officers must be able to see and share the benefits of migrating to the common platforms and new processes and modes of operation. Project owners and IT professionals on the other hand must communicate openly with subject officers at all levels and fully understand their concerns and address these as they develop and roll out the department-wide applications. Top management endorsement and support, early user participation, open communication and frequent progress updates are especially conducive towards securing user commitment and a more successful migration.

Outsourcing Management

With the increasing adoption of outsourcing as a means for developing ICT applications but faced with the reality of project delays becoming increasingly common, ensuring that outsourced projects are delivered on time has become an increasingly serious challenge in ICT management. Owing to lack of subject knowledge, insufficient technical expertise, underestimation of project complexity and changing user requirements, contractors often experience difficulties in delivering IT applications on schedule. Irrespective of cause, failure to deliver the application on time can result in varying degrees of impact on the operation of the statistical office.

The C&SD has adopted the PRINCE (*PR*ojects *IN* Controlled *E*nvironments) methodology (recommended by OGCI) for managing ICT projects. In line with the PRINCE methodology, demarcation of roles and responsibilities as well as reporting and escalation channels are clearly laid out for adherence by business users, contractors and IT project management teams. While the PRINCE methodology can facilitate project

management, it is essential that outsourced contractors thoroughly and fully understand the business requirements and assign manpower with the right expertise to undertake the projects. Business users, contractors and project management teams should work closely as a team, with regular checks on alignment of understanding of project requirements, in an effort to ensure that the projects can successfully deliver business requirements on schedule.

Benefits realisation and measurement

ICT benefits have traditionally been measured using benefit/cost models, with project savings (realisable or notional) and cost avoidance often quoted as benefits. Business benefits to be achieved are usually described in very general terms (e.g. faster response and more convenient access) without a clear measurement of the extent of such achievement. Rather than being perceived as a means of cutting costs and generating economies, ICT is increasingly positioned as an enabler of business and service transformation and thus it is increasingly important to quantify and measure ICT benefit from a business perspective (say, improve response time by 2 minutes, reduce the number of clicks from 10 to 3, etc.). Such an approach to measuring ICT benefit may pose a challenge to organisations long used to the traditional benefit/cost models. To start, it would be necessary to compile a set of basic business performance metrics and service delivery costing models and to assess the impact of ICT enabled transformation in comparison to these basic metrics and costs. Nevertheless, measuring the benefits of ICT projects in terms of improvements in service level that the ICT project aims to achieve makes reasonable sense. This also ensures that the real benefits of the ICT projects remain as the key focus and target of the project and are achieved as originally planned, while noting that the time-frame for achieving these benefits would usually run farther than the actual completion of the project.

Some Concluding Remarks

“User Centric, Business Driven, ICT Enabled” - this essentially summarises our approach in managing statistical development and the role played by ICT. Statistical development should be user centric (focus on needs of users, both internal and external), business driven (business users as champions) and ICT enabled (ICT serving as an enabler, whether infrastructure, application or tools). Successfully managing ICT in

furthering the mission of an NSO is an important challenge, now more than ever. In the coming years, we shall continue to pursue the business transformations that we have started and identify and embark on other business transformation opportunities made possible with the continuous advances in ICT, all in an effort to better meet the needs of users.

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