For discussion
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Legislative Council Panel on
Information Technology and Broadcasting

The Interoperability Framework -
An Enabler for Joined-up E-government Services

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PURPOSE

The purpose of this paper is to inform Members on the establishment of an Interoperability Framework (IF) to support E-government and the way forward. Details of the IF are available at the IF Internet homepage (http://www.itsd.gov.hk/itsd/english/infra/eif.htm).

NEED FOR AN IF

2. A key objective of E-Government is to provide client-centric, joined-up government services to the public. Given that government services are diverse and separately offered by individual bureaux and departments (B/Ds), they cannot be joined up easily (i.e. provided through a unified interface) unless the disparate computer systems of B/Ds are enabled to interoperate. In doing so, we have to ensure that the joined up systems continue to comply with their respective security requirements, including compliances with the data protection principles on personal data.

3. The IF is the enabler. It is a collection of technical and data specifications that define the interface between interacting applications. Under the IF, we recommend B/Ds to adopt the eXtensible Markup Language (XML) wherever applicable. XML is regarded by Government and the IT industry as a key technology to enhance interoperability.

IMPACT OF THE IF

4.   The IF applies to both Government to Government interactions and Government to public interactions.   It has no binding whatsoever on electronic interactions between members of the public themselves. Nevertheless, when the public build computer systems to interact with Government systems in the future, or when members of the public communicate with the Government electronically, the IF will provide the necessary specifications to enable effective interactions and communications between the private sector and the Government.

DEVELOPMENTS IN OTHER MAJOR E-GOVERNMENT COUNTRIES

5.   Other leading E-government countries are at different stages of enhancing the interoperability of their IT systems.   The UK is one of the more advanced countries in establishing an e-Government Interoperability Framework (e-GIF).   The first version of the UK's e-GIF was issued about two years ago and it has been reviewed every 6 months since then.   New Zealand has also published the first version of its e-GIF in July 2002. Australia has issued a consultation draft of an interoperability framework in May 2002.   In 2000, the US formed an XML Working Group to develop strategies for the effective use of XML, and in April 2002, the US General Accounting Office issued a report titled "Challenges to effective adoption of XML" that recommended more central co-ordination to facilitate the effective adoption of XML in US government agencies.

BENEFITS OF THE IF

To Government

6.   The IF will help speed up the development of joined-up E-government services, as there will be less need for interacting parties to negotiate on the interface mechanism and standards on a case by case basis.

Project owners can then focus their attention on business issues and on matters that would derive more value from the service chain. System designers should be able to ensure interoperability among systems and retain flexibility in selecting hardware and software to implement solutions.

7. Adoption of the IF will not incur extra cost to E-government projects but will allow B/Ds to extend the functionality of their systems more readily. This will eventually lower the cost of implementing new projects and help shorten the time for the introduction of new joined-up services. Examples of such services include those that support the submission of documents to multiple departments, and the processing of applications for various kinds of permits, licences and registrations submitted by both citizens and businesses.

To members of the public

8. Members of the public will not need to be aware of the IF generally, but they will notice the benefits. Through the more efficient and effective integration of applications and exchange of information across systems, citizens and businesses will be able to enjoy more joined-up E-government services. The IT professionals who implement E-government applications, however, are required to understand the IF thoroughly and apply the specifications where appropriate.

To the IT industry

9. The IF will help reduce the need or effort for negotiation on the model for information exchange or interconnection among business parties. This will lower costs as well as help speed up service implementation. Hence, it will help to improve our overall competitiveness.

10. In parallel with the Government's IF initiative, the industry is working on a number of initiatives to standardise the electronic interaction interfaces for their respective industries. Some of these standards have already been adopted by local organizations and Government departments. In developing joined-up services that involve both the public and private

sectors, the relevant business domain experts will collaborate on the relevant data specifications. For example, the Marine Department is working with a number of shipping companies on a pilot project to work out the data specifications for electronic submission of dangerous goods manifest.

11. Government has taken steps to drive the use of XML in E-government and encourage the industry to adopt the IF in their businesses. This fits well with the development of an IF for Hong Kong as a whole, with the objective of facilitating seamless integration of business processes. We will continue to make our best endeavours to promote and facilitate the local IT industry to adopt the IF.

12. The Government has been rendering strong support to the local industry to develop XML applications and promote its adoption. For example, the Innovation and Technology Fund (ITF) has sponsored part of the funding of the Electronic Business XML (ebXML) related initiatives established in the Centre for E-Commerce Infrastructure Development (CECID) of the University of Hong Kong. The CECID has developed some start-up ebXML applications and development tools that are open for use without charge. The ITF has also funded part of the NewsML project promoted by the Chinese NewsML community. Some organisations including government departments are already using these XML-based products for E-business. We will continue to liaise with organisations that are actively involved in XML development projects of interest.

CONSULTATION UNDERTAKEN

13. In December 2001, we formulated the initiative to put in place the IF and consulted the IT industry on the coverage of the technical standards. In August 2002, we conducted a public consultation on the draft technical specifications, compliance policy, and management framework of the IF. We briefed the Information Infrastructure Advisory Committee (IIAC) before and after the public consultation. IIAC members, the public, the industry and B/Ds indicated strong support for the

initiative and responded with valuable suggestions which we have considered in finalising the IF documents.

PROMULGATION OF IF

14.   On 21 November 2002, we promulgated the IF to Government B/Ds for their adoption in the development of new systems that will interact with the systems of other B/Ds or the public (including businesses), with effect from 2 January 2003.

15.   A number of technical specifications in the IF are relevant to electronic submissions under the Electronic Transactions Ordinance (ETO) (Cap. 553).   The Secretary for Commerce, Industry and Technology (SCIT) has, under section 11 of the ETO, specified by notice published in the Gazette the manner and format for electronic submissions to which the ETO applies.   Most of the specifications in the IF relevant to the ETO have already been included in the Gazette notice issued by SCIT.   SCIT will issue a Gazette notice to promulgate the new interoperability specifications as format and manner requirements under the ETO in due course.

MAINTENANCE AND MANAGEMENT OF IF

16.   The development of the IF is a long-term, on-going strategic effort.   We will review and update it every six to twelve months as appropriate to accommodate new business requirements, in pace with technological advancements.

17.   The Information Technology Services Department (ITSD) convenes the Interoperability Framework Co-ordination Group (IFCG) to manage the IF.   The IFCG is chaired by ITSD and comprises senior officers responsible for IT management in B/Ds.   ITSD also chairs an XML Co-ordination Group (XMLCG) to advise on strategies to facilitate

more effective adoption of XML. The XMLCG comprises experienced XML adopters from both the public and private sectors.

18.   In addition, specialist groups in B/Ds (e.g. the cross-departmental committee overseeing the Computer-Aided-Drafting (CAD) Standard for Works Projects) have taken the lead in specifying interoperability standards to address their specific business needs.   The IFCG will liaise closely with these specialist groups in maintaining the IF.

19.   The key stakeholders of the IF include B/Ds as well as the IT industry.   The framework will be effective only if they use it.   We will continue to involve them actively in the development and enhancement of the IF in order to ensure that it is pragmatic and up-to-date, and able to address and balance the needs of all the stakeholders.

SOME CHALLENGES OF IMPLEMENTATING JOINED-UP SERVICES

20.   To put a joined-up service into operation, apart from re-engineering the business processes to streamline operation, the stakeholders have to work out how to interconnect their business processes.   Very often this requires a long and tedious negotiation and data alignment process.

21.   Data alignment is necessary because B/Ds and their business partners are likely to have different business vocabulary or data attributes like format, structure or validation rules.   For example, B/Ds may call an organization applying for a certain licence in different ways, like "company", "business", "applicant".   The same piece of data like address may be kept by one B/D as 2 lines of free text, another B/D may keep it in a more granular manner, segregating the address into flat, floor, building, street, district, etc.   Without an agreed convention, similar data alignment exercises may have to be repeated every time a joined-up initiative is pursued even though some of the data being addressed are common.

RECOMMENDATIONS TO HANDLE THESE CHALLENGES

22.   Such repetitive effort can be reduced through appropriate standardization of business vocabulary and data attributes of data items commonly used by B/Ds.   XML schema, as a means to reflect the business vocabulary and attributes of particular data items, can facilitate such standardization.

23.   Similar standardization initiatives are in progress in most industry sectors around the world.   Examples include ebXML's Core Component initiative, OASIS's Universal Business Language (UBL), LegalXML, NewsML, etc.

24.   To pursue such standardization in the HKSAR Government, the XMLCG recommended that the Government :

- follow pre-agreed schema design guidelines to create business vocabulary and to structure or format data in a consistent manner to maximize re-usability;
- mandate the re-use of those pre-agreed schemas for data items commonly used across B/Ds (i.e. the core schema);
- put in place a mechanism for the on-going management of core schema; and
- design application specific schemas with re-use in mind and publish those that might be useful to other parties to encourage the re-use of schema.

THE WAY FORWARD

25.   In 2003, the XMLCG will progressively develop XML schemas for data items like name and address that are commonly used in E-government, to facilitate information exchange among interacting parties. The XMLCG has commissioned the University of Hong Kong to develop a set of XML schema design and management guidelines for reference by B/Ds in the development of joined-up services.   We will also set up a

registry to facilitate the collection and sharing of XML schemas.   We will continue to review the IF and keep it up-to-date in an open and transparent manner.

26.   The definition of core schemas will be a challenging task because the data items involved are used by many B/Ds and much alignment and agreement have to be made before they will adopt a schema which does not exactly conform to that implemented in their existing systems.   Gaining consensus on a schema is therefore an organisational and business issue more than a technical matter.   All parties must be committed to a vision of the seamless flow of information across Government.

27.   Despite the challenge, we will make our best endeavours to work with the XMLCG on the above initiatives because we believe these are the necessary steps to facilitate the development of joined-up services.

ADVICE SOUGHT

28.   Members are invited to note the establishment of IF and advise on the proposed way forward.

Information Technology Services Department
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