Government of Mauritius

Ministry of Information Technology and Telecommunications

E-Government Initiative

e-Government Interoperability Framework

Version 1.0

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Contents

Executive summary

Better public services tailored to the needs of the citizen and business, require the seamless flow of information across government. The e-Government Interoperability Framework (e-GIF) sets out the government's technical policies and specifications for achieving interoperability and information systems coherence across the public sector. The e-GIF defines the essential pre-requisites for joined-up and web enabled government. It is a cornerstone policy in the overall e-Government strategy.

Adherence to the e-GIF specifications and policies is mandatory. They set the underlying infrastructure, freeing up public sector organisations so that they can concentrate on serving the customer through building value added information and services. It will be for the organisations themselves to consider how their business processes can be changed to be more effective by taking advantage of the opportunities provided by increased interoperability.

The main thrust of the framework is to adopt the Internet and World Wide Web specifications for all government systems. Throughout this section use of the term "system" is taken to include its interfaces. There is a strategic decision to adopt XML and XSL as the core standards for data integration and management of presentational data. This includes the definition and central provision of XML schemas for use throughout the public sector. The e-GIF also adopts specifications that are well supported in the market place. It is a pragmatic strategy that aims to reduce cost and risk for government systems whilst aligning them to the global Internet revolution.

The Framework also sets out policies for establishing and implementing metadata across the public sector. The e-Government Metadata Standard will help citizens find government information and resources more easily.

Stipulating policies and specifications in themselves is not enough. Successful implementation will mean the provision of support, best practice guidance, toolkits and centrally agreed schemas.

The aims of the e-GIF will not be achieved overnight. The strategy needs to be managed as a long-term ongoing initiative and must therefore be supported by robust processes. These processes, including the roles and responsibilities of key stakeholders, committees, management and working groups, are outlined in the document.

It is also essential to ensure that the e-GIF remains up to date and aligned to the requirements of all stakeholders and able to embrace the potential of new technology and market developments.

This work has been done based on documented government experience in other countries and in particular the UK e-government initiative.

1　Introduction

This document has been prepared on the request of the e-Government Task Force to clearly formulate policies and specifications for the interoperability of government information systems in the context of the e-government initiative.

This document has been prepared by the E-Government Interoperability Working Group on documented government experience in other countries and in particular the UK e-government initiative.

This version of the e-government interoperability framework document was approved by the Government on 22nd November 2002.

2   Policy and scope

2.1   Modern joined-up government demands joined-up information systems. Interoperable systems working in a seamless and coherent way across the public sector hold the key to providing better services, tailored to the needs of the citizen and business and at a lower cost.

2.2   Clearly defined policies and specifications for interoperability and information management are also key to staying connected to the outside world and aligned to the global information revolution. The e-Government Interoperability Framework (e-GIF) provides these. It is a fundamental Framework Policy for the e-Government strategy.

2.3   Government information resources are not only of value in themselves. They are valuable economic assets, the fuel of the knowledge economy. By making sure the information we hold can be readily located and passed between the public and private sectors, taking account of privacy and security obligations, we can help to make the most of this asset, thereby driving and stimulating our economy.

About the e-GIF

2.4   This document contains:

Part 1: Framework. It contains the high level policy statements, management, implementation and compliance regimes.

Part 2: Policies and specifications. It contains the technical policies and tables of specifications, and a glossary and abbreviations list.

Part 3: Appendices. It contains abbreviations and acronyms used in e-GIF and glossary of metadata terms

2.5   The e-GIF defines the minimum set of technical policies and specifications governing information flows across government and the public sector. They cover interconnectivity, data integration and information access. The government is committed to ensuring that these policies and specifications are kept aligned to the changing requirements of the public sector and the evolution of the market and technology.

Key policies

2.6   These are the key policy decisions that have shaped the e-GIF:

- alignment with the Internet: the universal adoption of common specifications used on the Internet and World Wide Web for all public sector information systems
- adoption of XML as the primary standard for data integration and presentation tools for all public sector systems
- adoption of the browser as the key interface; all public sector information systems are to be accessible through browser based technology; other interfaces are permitted but only in addition to browser based ones
- the addition of metadata to government information resources
- the development and maintenance of the GCL (Government Category List)
- adherence to the e-GIF is mandated throughout the public sector.

2.7 The selection of e-GIF specifications has primarily based on the UK e_GIF framework which has been adopted in several countries and has also been driven by:

- interoperability - only specifications that are relevant to systems interconnectivity, data integration, information access and content management are specified
- market support - the specifications selected are widely supported by the market, and are likely to reduce the cost and risk of government information systems
- scalability - specifications selected have capacity to be scaled to satisfy changed demands made on the system, such as changes in data volumes, number of transactions or number of users
- openness - the specifications are documented and available to the public at large.

Scope

2.8 The e-GIF covers the exchange of information between government systems and the interactions between:

- Government and citizens
- Government and businesses
- Government organisations

2.9 It is recognised that compliance with the e-GIF cannot be imposed on citizens and businesses, but Government will make it clear to all that this is their preferred method of interface.

2.10 "Government" includes central government departments and their agencies, local government, and the wider public sector.

2.11 The e-GIF specifications are mandated on all new systems that fall within the scope defined in paragraph 2.8 above.

2.12 The e-GIF does not standardise the appearance of information on the human interface, which can be provided by various user channels e.g. Internet, public kiosks, WAP phones. The e-GIF does standardise the interchange requirements for the delivery of data to such interfaces and tools for the management of the presentation of such data.

2.13 The technical policies for interoperability across the public sector cover three key areas: interconnectivity, data integration and information access. This is the minimum set necessary to support the range of transactions and services provided by government and to integrate information systems within government.

Relationships with other initiatives

2.14 The e-GIF is one of the policy frameworks for the e-Government strategy of which it is an integral part.

Your involvement

2.15 Continual engagement of all our stakeholders in the development and implementation of the e-GIF is a fundamental policy objective. Government departments and their agencies, local government, industry and the citizen will be all encouraged to comment and suggest ways of improving the strategy and provide support and implementation of the e-GIF.

3   Implementation support

3.1   This section covers the processes by which the e-GIF and the tools needed to implement it will be developed, applied and maintained.

Priorities

3.2   The programme for delivering schemas and agreeing further interoperability specifications will be primarily driven by the needs of citizen and business facing services. Priority will be given to schemas that serve the requirements of services or processes that are generic across many public sector organisations. Facilitation of new, joined-up services and inter-organisational process developments will also be given precedence.

XML schemas production

3.3   A primary role of the Interoperability Working Group is to promote the production and management of the XML schemas necessary to support data interoperability requirements of the e-Government strategy.

3.4   XML schemas will be developed by specialist groups (see Government Schemas Group below). The Government Schemas Group will manage the acceptance, publication, and any subsequent change requests for the schema. XML schemas that have been accepted by the group are open for anyone to make comments.

3.5   The Government Schemas Group sets the design rules to be used by the XML schema developers and will use these to validate schemas proposed for publication. The rules include compliance with W3C specifications as described in Part 2.

3.6   The Government Schemas Group will track international XML specifications development through links with standards organisations such as W3C and OASIS. These links will provide provisional schemas, which will be taken as one of the inputs for government-wide consultation and adoption if appropriate.

e-Government Metadata Standard

3.7   The e-GMS defines the structure and rules governing metadata used by the public sector. This standardisation is essential if the data is to be truly interoperable, and if citizens are to be able to find government information and services without knowledge of the structure of government and the allocation of responsibilities within it.

muonline.gov.mu

3.8   The web site will form a fundamental part of the e-GIF implementation strategy. It will support the whole initiative and will incorporate the management processes so that government can consult and take decisions using the power and speed of the Internet.

3.9   muonline.gov.mu will provide implementation support through the production of centrally agreed, freely available XML schemas that can be reused throughout the public sector to reduce the costs and risks of developing data interchange systems. The web site will be used to seek proposals for schemas, publish them for comments and receive requests for changes to them.

The site is designed to encourage widespread participation in the development of the schema set and is completely open for the submission of proposals and comments to encourage innovation from the public sector and industry.

3.10 The web site will also be used to provide help and guidance for XML schema developers. This will include best practice guidance, case study material, and advice on toolkits to support the production of XML schemas, and specifically to help with the conversion of legacy system data.

3.11 It will also be used for wide consultation on a number of other e-Government frameworks and documents. It is intended to make adoption of the e-GIF policies and specifications simple, attractive and cost effective.

Membership of working groups

3.12 Public and private sector organisations working on Government interoperability projects may be invited to become members of the various working groups mentioned in Section 3. They can attend meetings, and take part in decision making and direction setting for the groups. The list of full members will change over time as new interoperability projects are started and existing ones are completed. All organisations involved in public sector XML based projects and any other specifications forming part of the e-GIF may become associate members, and have information about new proposals and changes pushed to them by e-mail.

4   Management processes

Management groups

4.1   The roles and responsibilities of government, other public sector and industry organisations are outlined below. Whilst this is not meant to be exhaustive it does indicate the main functions.

E-Government taskforce

4.2   The E-Government taskforce is the lead authority for implementing and maintaining this framework. In collaboration with departments, local authorities and other public sector bodies, the E-Government taskforce will:

- lead the development and maintenance of the e-Government Interoperability Framework and provide the management infrastructure to support the processes
- act as the focal point for co-ordinating interoperability efforts throughout government and ensuring a rapid response to proposals and priorities of government
- co-ordinate the development and maintenance of:
  - agreed XML schemas for use throughout government
  - the e-Government Metadata Standard (e-GMS)
  - the Government Category List (GCL)
  - best practice guidance

Public sector organisations

4.3   The full participation of government departments, their agencies, and local government is essential to successfully delivering interoperability in the public sector. Although central direction will be provided where required, much of the action will take place in individual public sector organisations that will need to:

- contribute to the continuous development and improvement of this framework
- ensure that e-GIF compliance is a fundamental part of their organisational e-business and IT strategies
- produce a 'roadmap' for implementing the organisation's conformance with the framework
- work with users of their services or data to identify those services that can usefully be made more widely available
- ensure that they have the skills to define and use the specifications needed for interoperability
- establish a contact point who understands the impact of requests for change and can respond within the stated time period
- budget for and supply resources to support the processes
- identify the relevant customer(s) or stakeholders within their organisation and ensure their interests are represented;
- take the opportunity to rationalise processes (as a result of increased interoperability) to improve the quality of services and reduce the cost of provision.

Industry

4.4 This framework is based on government working in open partnership with industry. It proposes joint working and development of the policies and specifications for interoperability, relying heavily on industry worldwide to comment and to provide innovative solutions. Specifically, the following roles will need to be filled:

- application of the policies and specifications agreed in this framework to systems delivered to the public sector
- participation in the consultation process through the Request for Comment (RFC)
- introduction of innovations in technology and business to continually improve this framework and the delivery of its objectives 'at Internet speed'

The citizen

4.5 e-Government is essentially about government better serving the needs of the citizen. The e-GIF is an enabling framework for delivering the services seamlessly and coherently. The government welcomes and encourages the citizen to provide comments, suggestions and innovations that may help it to improve information access and service delivery.

Interoperability Working Group

4.6 This group will operate under the e-Government Task Force. The Interoperability Working Group will be responsible for all aspects of the framework including policies, specifications, implementation and management. Membership of the group is open to all public sector bodies as represented in the e-Government Task Force.

Government Schemas Group

4.7 The primary roles of the group will be to set the specifications for, and co-ordinate the production of, XML schemas for use across the public sector. This group, which will report to the Interoperability Working Group, will draw together representatives from across the public and private sectors to develop schemas requested by the Government Processes Group, and will endorse schemas produced elsewhere in the public sector. Schemas produced and endorsed by this group will pass through the e-GIF approval process.

Metadata Working Group

4.8 This group, which will report to the Interoperability Working Group, will provide advice and comments on all metadata aspects of the e-GIF, and will develop and maintain the e-Government Metadata Standard and the GCL.

Change management

4.9 The e-GIF specifications will inevitably change and will have the capability to change quickly when required. The change management process must ensure that the e-GIF remains up to date and is aligned to the requirements of all stakeholders and to the potential of new technology and market developments. The following paragraphs describe an inclusive Internet based consultation process that will encourage participation and innovation. They also describe how changes to the specifications will be managed.

Consultation and innovation

4.10 The overall strategy for Information Age Government identifies three basic forms of dialogue: public sector to public sector; public sector to business; public sector to the citizen. If interoperability specifications are to fully support the strategy then they must be open to the widest form of consultation that involves all these players. The e-GIF consultation process will target organisations that are known to be interested in the specific specifications, having been identified as participants in the service or users of existing specifications, but will be open to all. Unsolicited comments and suggestions will be encouraged over the web site.

Request for Comments (RFC)

4.11 All draft policies, specifications and XML schemas will be posted with a Request for Comments on the proposed draft or change. Stakeholders will be notified of the RFC but the web site offers an invitation to anyone to comment on the draft document. The consultation process does not preclude unsolicited comments on currently agreed policies and decisions, which are also encouraged.

Updates to the e-GIF

4.12 Part 1 of the e-Government Interoperability Framework will be reviewed annually and updated as necessary.

4.13 Part 2 will be revised and updated every six months. Supplementary guidance will be issued between formal updates where this is considered necessary.

5 Complying with the e-GIF

Introduction

5.1 Adherence to the e-GIF is mandatory, as stated in paragraph 2.11, and this section provides general guidance on what compliance means in that context and how it will be enforced. It is intended to inform all those involved in the development and provision of public sector systems and services of their responsibilities and the timetable for conforming to the e-GIF. Throughout this section use of the term "system" is taken to include its interfaces, which are the prime focus of the e-GIF policies and specifications.

5.2 The scope of the e-GIF is set out in paragraphs 2.8 – 2.13, and also includes those functions within private/commercial organisations that develop and/or deliver licensed government services. However, the prime responsibility for ensuring compliance rests with the government purchasing or licensing authority.

What does complying with the e-GIF mean?

5.3 At the highest level complying with the e-GIF means:

- providing a browser interface for access
- using XML as the primary means for data integration
- using Internet and World Wide Web standards
- using metadata for content management

5.4 These four elements are fundamental but equivalent standards and additional interfaces are permissible. For example, the majority of government users and all public users will use a browser interface.

5.5 The ultimate test for interoperability is: "*the coherent exchange of information and services between systems*". If this is achieved then the system can be regarded as truly interoperable. Furthermore it must be possible for "*any component or product used within an interface to be replaced by another of a similar specification and the functionality of the system still be maintained*". To be e-GIF compliant, a system should satisfy both these requirements.

5.6 At a detailed level, testing for compliance needs to be done against the policies and specifications listed in the e-GIF.

5.7 The aspects of the system where the tests need to be applied are:

- interconnection
- data integration
- information access

5.8 The principles and specifications are set out in Part 2.

Use of XML schemas and data standards

5.9   Systems are expected to use agreed XML schemas and agreed data standards.

Timetable

5.10   In practice, it is expected that organisations will not be able to participate effectively and at minimum cost in future data interchange processes unless they comply with the e-GIF specifications. The compliance rules and timetable are that:

- all new systems that fall within the mandate will provide interfaces that conform to the specifications, or equivalents, in the e-GIF by default. They may also provide additional interfaces. New systems should be developed to comply with the e-GIF specifications in force on the day approval is given to the business. Should changes be made to the e-GIF thereafter which impact the system development, then a full assessment should be made of the cost and benefit of accommodating the changes before the system goes live or subsequently
- legacy systems that fall within the mandate will need to provide interfaces that comply with the specifications or equivalents within the following timescales:
  - for systems that need to link to Government Online Centre, the timetable for making those connections will be acceptable;
  - for other legacy systems within the mandate, the interfaces should be provided on demand or through replacement.

5.11   Systems that fall outside the scope and mandate will generally be internal administration legacy systems, i.e. those that have no interface to external customers or connection to external systems. For these systems it is recommended that every opportunity should be taken to comply with the e-GIF, e.g. through upgrade or enhancement activity. This may involve commissioning additional work from suppliers.

Stakeholders

5.12   The stakeholders who need to know and understand what complying with the e-GIF means are:
  - e-Business Strategists, who should ensure that their e-business strategy mandates compliance with the e-GIF. They should be aware that compliance with the e-GIF will be part of the conformance check for the release of funding by the Ministry of Information Technology and Telecommunications.

  - CIO, Project Managers, who are responsible for ensuring the relevant e-GIF policies and specifications are applied.

Compliance responsibilities

5.13   The ultimate responsibility for compliance rests with the system's CIO and the Project Manager.   Compliance is by self-regulation using normal departmental checking arrangements throughout the system's development life-cycle.   It will be for service organisations themselves to consider how their business processes can be changed to be more effective by taking advantage of the opportunities provided by increased interoperability.

Public sector communities

5.14   The compliance rules for these basic specifications apply to all public sector bodies but the public sector includes identifiable communities who exchange some types of information with their own members. Any specialised data interchange specifications must be in addition to, and must not conflict with, the e-GIF interoperability requirements. In particular, the use of such specifications should not be a barrier if there is a possibility of future interchange of the information outside the community.

Additional guidance

5.15   Whilst the above provides general guidance of the e-GIF compliance requirements, many situations will need to be assessed on a case-by-case basis and detailed questions of compliance in these situations should be addressed to e-government interoperability working group.

6 Interconnection technical policies

The technical policies for systems interconnection are:

- departments are to interconnect using IPv4
- interfaces for e-mail systems are to conform to the SMTP/MIME for message transport and POP3 for mailbox retrieval. Within government, the norm will be to use the intrinsic security provided by the GSI to ensure e-mail confidentiality.   Outside GSI and other secure government networks, S/MIME V3 should be used for secure messaging
- the GSI Directory schema is to be used to support a range of communication services including message handling, telephone and facsimile services as well as interactive access to a range of other applications, except for WEB based transactions over SOAP when UDDI is to be used
- future WEB based services are to be based on SOAP, UDDI and WSDL
- projects are to follow the Mauritian Government domain naming policy
- DNS is to be used for Internet/intranet domain name to IP address resolution
- FTP should be used where file transfer is necessary within government intranets
- Restart and recovery facilities of FTP are to be used when transferring very large files
- Web based technology is to be used in applications that previously used Terminal Emulation whenever possible[1].

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[1] Products exist which can provide browser access to legacy systems without having to change those systems; typically these products can provide either direct access to the legacy screens or complete replacement GUIs

7 Interconnection specifications

7.1 The specifications for interconnectivity are:

Table 1 Specifications for interconnectivity

Component	Specification
Hypertext transfer protocols	HTTP v1.1 (RFC 2616) Hypertext specifications include on-line wide-area publishing services.
E-mail transport	E-mail products that support interfaces that conform to the SMTP/MIME for message transfer. This includes RFC 2821; RFC 2822; RFC 2045; RFC 2046; RFC 2646; RFC 2047; RFC 2231; RFC 2048; RFC 3023; RFC 2049 NB. E-mail attachments may conform to the file types for browsers and viewers as defined for the specific delivery channel, see chapter on channels below.
E-mail security	S/MIME V3 shall be used where appropriate for pan government messaging security unless security requirements dictate otherwise. This includes RFC 2630 to RFC 2633.
Mailbox access	E-mail products that provide mail access facilities shall as a minimum conform to POP3 for remote mailbox access. This includes RFC 1939; RFC 1957, RFC 2449.
Directory	X.500 core schema as defined in GNC Technical Notice 1/2001 (Populating the GSI Directory). LDAP V3 is to be used for general-purpose directory user access.
Domain name services	DNS (RFC 1035)
File transfer protocols	FTP (RFC 959) (with restart and recovery) and HTTP (RFC 2616) for file transfer
Newsgroup services	NNTP (RFC 977) where required, subject to security constraints
LAN/WAN interworking	IPv4 (RFC 791)

The following specifications are to be used to meet the requirements of the IAG Security Framework where appropriate.

IP security	IP-SEC (RFC2402/2404)
IP encapsulation security	ESP (RFC2406)
Transport security	SSL v3/TLS (RFC 2246)

Certain e-government information is 'sensitive' in that it might contain personal or commercially confidential information, but it does not fall within the definitions of government classified information. For the protection of such information, e.g. data and private keys, the following specifications are advised:

Encryption algorithms - 3DES, AES, Blowfish
For signing - RSA , DSA
For key transport - RSA , DSA
For hashing - SHA-1, MD5

The above is not exhaustive and is intended as a guide.

Transport   TCP (RFC 793)
                                             UDP (RFC 768) where required, subject to security constraints

Note: Copies of the IETF RFCs can be found at www.ietf.org/rfc.html

Web service request delivery   SOAP v 1.2, Simple Object Access Protocol as defined by the W3C, the
                                             specifications can be found at:
                                             http://www.w3.org/TR/2001/WD-soap12-part1-20011217/
                                             http://www.w3.org/TR/2001/WD-soap12-part2-20011217/
                                             Guidance on the use of SOAP can be found at:
                                             http://www.w3.org/TR/2001/WD-soap12-part0-20011217/
                                             and
                                             http://www.w3.org/TR/2001/WD-xmlp-scenarios-20011217
                                             See the W3C web site; http://www.w3.org for the latest drafts of the SOAP
                                             specifications and transport bindings.

Web service request registry   UDDI v 2.0 specification, (Universal Description, Discovery and
                                             Integration) defined by UDDI Project, UDDI is an industry initiative. The
                                             specifications can be found at:
                                             http://www.uddi.org/specification.html

Web service description language   WSDL 1.1, Web Service Description Language as defined by the W3C, the
                                             specifications can be found at:
                                             http://www.w3.org/TR/wsdl

8   Data integration technical policies

8.1   The technical policies for systems data integration and transformation are:

- XML and XML schemas for data integration [2]
- UML, RDF and XML for data modelling and description language
- XSL for data transformation.

8.2   XML products will be written so as to comply with the recommendations of the World Wide Web Consortium (W3C). Where necessary the government will base the work on the recommended W3C specifications but will avoid the use of any product specific XML extensions that are not being considered for open standardisation within the W3C.

8.3   Centrally agreed XML schemas are approved through the EGif processes (see Part 1).

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[2] Legacy systems which are tightly integrated or systems that are internal to departments (such as batch processing systems) may use other processing environments.

9   Data integration specifications

9.1   The Mauritian Government specifications for data integration and transformation are:

Table 2   Specifications for data integration

Component	Specification
Data Integration Metadata/Meta Language	XML (Extensible Markup Language) as defined by W3C www.w3.org/XML
Data Integration Metadata definition	XMLschema as defined by W3C, the specifications can be found at XML Schema Part 1: Structures XML Schema Part 2: Datatypes.
Data transformation	XSL (Extensible Stylesheet Language) as defined by W3C www.w3.org/TR/xsl/ XSL Transformation (XSLT) as defined by W3C http://www.w3.org/TR/xslt
Data Modelling and Description Language	UML (Unified Modeling Language) http://www.omg.org/gettingstarted/specsandprods.htm RDF (Resource Description Framework) as defined by W3C www.w3.org/TR/REC-rdf-syntax/
Data definition and schema standardisation	As per EGif processes in Part 1
Minimum interoperable character set	Transformation Format – 8 bit UTF-8 (RFC 2279), which supports the exchange of the full character set. Individual items in the XML schema may be further restricted in character set on a case by case basis.
Geospatial data	GML (Geography Markup Language) as defined by Open GIS Consortium (OGC) www.opengis.org/techno/specs.htm
XML signatures	XML-Signature Syntax and Processing (XMLsig) as defined by W3C. http://www.w3.org/TR/2002/REC-xmldsig-core-20020212/

Note: Copies of the W3C specifications can be found at: www.w3.org/TR

Forms

9.2   Future versions of e-GIF will mandate standards for XML based forms together with best practice guidance on their use; current guidance is to use the XForms 1.0 standards as defined by W3C, see www.w3.org/TR/xforms/

Notes on XML and middleware:
- not all systems are required to be directly XML enabled
- where appropriate it is acceptable to use middleware as illustrated below.

Note: although the configurations below present potential solutions, it should be clear that new procurements should strive to use the direct XML model as shown.

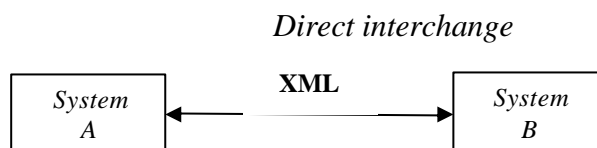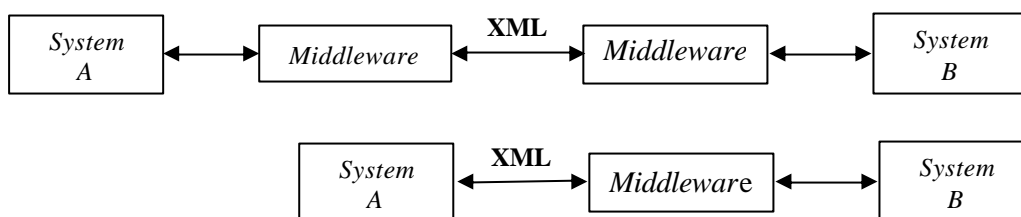*Figure 1   Direct XML Model*

Direct interchange

Figure 2 Interchanges via middleware

10 Information access technical policies

The technical policies for information access are:

- government information systems will be designed so that they are accessible through browser based technology; other interfaces are permitted in addition to browser based ones
- government information systems providing e-government services will aim to provide such services to the user (citizen and business) via a range of delivery channels
- government information systems should be designed so that information content of e-government services can be defined independent from any specific delivery channel
- government information systems providing e-government services will be designed so that the essential information of a service is accessible to the citizen via delivery channels with limited capability where appropriate, using personalisation technologies like transcoders
- government information systems will be designed to meet Mauritian legislation, and to support channels that provide accessibility to all citizens
- for e-government services aimed at the citizen, government information systems will be designed to be accessible to the citizen via multiple channels to suit the specific needs of the citizen
- when government information systems claim to support a particular delivery channel, then conformance to the listed specifications for that channel is mandatory
- all government information systems providing e-government services will be capable of supporting the Internet as a delivery channel, either directly, or via third party services
- when using the Internet as a delivery channel, government information systems will be designed so that as much information as possible can be accessed and manipulated from minimal functionality browsers as specified in table 5
- some e-government services can make use of the full functionality provided by modern browsers running on personal computers and workstations, see table 3
- when using the Internet as a delivery channel, additional middleware or plug-ins can be used, when necessary, to enhance browser functionality supported by PC and workstations, provided these can be easily downloaded without incurring a licensing fee
- government information systems will be designed to provide protection against security risks of connection to the Internet, including the ability to protect against the vulnerability of downloading executable content code that is not authenticated.

11 Information access delivery channels

11.1   The full range of services to be delivered to the citizen will dictate the specifications required. Content management techniques and personalisation technologies can be used to support various delivery channels e.g. low function web browsers, public kiosks, Digital TV, WAP phones, etc. Transcoding services, as an example of personalisation technologies, can deliver web content to a variety of destination environments within greatly reduced timescales and at significantly reduced cost. The principle is that transcoding can be used to dynamically filter, convert and reformat web content to match the requirements and display capabilities of the destination device. Transcoding technology is server-side software that modifies Web page content based on data protocols, markup languages, device and network parameters and user preferences.

11.2   Personalisation technologies may also be used to support groups such as visually impaired or blind people (i.e. by using text translation, larger fonts and graphics, audio, etc. via a transcoder). Such aspects are covered by the Web design guidelines.

12 Information access specifications

Table 3   Specifications for information access – Computer Workstations

When the information access device is considered to be a reasonably powerful computer workstation less than two years old, such as a Pentium II or III PC or Apply Mac, then the standards defined below are to be supported . For older or less powerful work stations, see table 5.

Basic Component	Specification
Hypertext interchange formats	Those parts of HTML v4.01 and XHTML v1.0 commonly implemented by Netscape Navigator v4 or later, and MS Internet Explorer v4 or later, plus their interoperable extensions.
Document file types	Rich Text Format as (.rtf) files Plain/Formatted Text as(.txt) files Hypertext documents as (.htm) files Adobe Acrobat as (.pdf) minimum viewer version 4 Microsoft Word viewer/reader (.doc), minimum support word97 format. Lotus Notes Web Access (.nsf)
Spreadsheet file types	Hypertext documents as (.htm) files Delimited file as (.csv) files
Presentation file types	Hypertext documents as (.htm) files
Character sets and alphabets	UNICODE ISO/IEC 10646-1:2000 Transformation Format for 16 planes of group 00 (UTF-16)
Graphical/still image information exchange specifications	Joint Photographic Experts Group /ISO 10918 (.jpg) Graphics Interchange Format (.gif) Portable Network Graphics (.png) For images that will not tolerate information loss use Tag Image File format (.tif) When highly compressed imaging is required use Enhanced Compressed Wavelet (.ecw)
Scripting	ECMA 262 Script
Vector Graphics	Scalable Vector Graphics (.svg) Vector Markup Language (vml)
Moving Image and audio/visual information exchange specifications	Moving Picture Experts Group (.mpg) MPEG-1/ISO 11172 Conversion is provided by most mainstream packages
Audio/video streaming data	RealAudio/RealVideo (.ra, .ram, .rm, .rmm) Shockwave (.swf) Windows media formats (.asf, .wma, .wmv,) Apple Quicktime (.avi, .mov, .qt) Waveform Audio File Format (.wav). 8µ Law H263

Animation	Macromedia Flash (.swf)
	Apple Quicktime (.avi, .mov, .qt)
	Macromedia Shockwave (.swf)
Extended Programming	Java Virtual Machine – for browser enhancements as a minimum conforming to the Java^{TM} Virtual Machine Specification issue 1 Note: A restricted rights copy of the JVM specifications can be found at: http://java.sun.com/docs/books/vmspec/html/VMSpecTOC.doc.html
General purpose files and compression	File types (.zip), (.gz), (.tgz) and (.tar)

12.1 The specifications for the delivery of services to the citizen via mobile phones are dependent upon the evolution and availability of new technologies like 3G. If there is a need for current service provision via mobile phone then the WAP Specification Suite published by the WAP Forum is appropriate.

12.2 The issues of security relating to transactions undertaken through mobile phones are complex and depend on emerging industry specifications. Work in this area will have to be undertaken in due course. In the meantime the lack of specifications does not imply that security issues can be ignored. Decisions will need to be made on a case by case basis depending on the nature of the transaction in question.

Table 4   Specifications for information access - Mobile Phones

Component	Specification
WAP specifications	The specifications to be used are defined by the WAP Forum, see www.wapforum.org/what/technical.htm

Table 5   Specifications for information access – Other devices

Component	Specification
Hypertext interchange formats	HTML v3.2
Document file types	Rich Text Format as (.rtf) files Plain/Formatted Text as(.txt) files Hypertext documents as (.htm) files
Spreadsheet file types	Hypertext documents as (.htm) files
Presentation file types	Hypertext documents as (.htm) files
Character sets and alphabets	UNICODE ISO/IEC 10646-1:2000 Transformation Format for 16 planes of group 00 (UTF-16)
Graphical/still image information exchange specifications	Joint Photographic Experts Group /ISO 10918 (.jpg) Graphics Interchange Format (.gif) Portable Network Graphics (.png)
Scripting	ECMA 262 Script

13 Appendices

Appendix A: Abbreviations and Acronyms used in e-GIF

3DES	Treble Data Encryption Standard
3G	Third Generation mobile phones
AES	Advance Encryption Algorithm
.csv	Comma Separated Value format
DNS	Domain name services
DSA	Digital Signature Algorithm
.dhtml	Dynamic Hypertext Markup Language
ECMA	European Computer Manufactures Association
e-GIF	e-Government Interoperability Framework
e-GMS	e-Government Metadata Standard
FAQs	Frequently Asked Questions
FTP	File Transfer Protocol
.gif	Graphics Interchange Format
GCL	Government Category list
GML	Geography Markup Language
GNC	GSI Nerve Centre
GSI	Government Secure Intranet
GUI	Graphic User Interface
.gz	GZIP compression file format
HTML	Hypertext Markup Language
HTTP	Hypertext transfer protocols
IAG	Information Age Government
IDA	Interchange of Data between Administrations
IETF	Internet Engineering Task Force
ISO/IEC	International Standards Organisation
IP	Internet Protocol
JPEG	Joint Photographic Experts Group
.jpg	Joint Photographic Experts Group File Format
LAN	Local Area Network
LDAP	Lightweight Directory Access Protocol
MD5	Message Digest 5
MIReG	Managing Information Resources for e-Government
mp3	MPEG (Moving Picture Experts Group) Audio Layer 3
MPEG	Moving Picture Experts Group
.mpg	Moving Picture Experts Group file format
MS	Microsoft
NNTP	Network News Transfer Protocol
.nsf	Notes Storage File
OASIS	Organization for the Advancement of Structured Information Standards
OGC	Open GIS Consortium
.pdf	Portable Document Format
.png	Portable Network Graphics
RDF	Resource Description Framework
RFC	Request for Comments

RFP	Request for Proposals
RSA	Rivest-Shamir-Adleman
.rtf	Rich Text Format
SHA-1	Secure Hash Algorithm 1
S/MIME	Secure Multipurpose Internet Mail Extensions
SMTP/MIME	Simple Message Transfer Protocol/Multipurpose Internet Mail Extensions
SOAP	Simple Object Access Protocol
SSL	Secure Socket Layer
.svg	Scalable Vector Graphics
.tar	Tape Archive File Format
TCP	Transmission Control Protocol
.tif	Tag Image File Format
TLS	Transport Layer Security
UDDI	Universal Description Discovery and Integration
UDP	User Datagram Protocol
UML	Unified Modelling Language
URL	Uniform Resource Locator
UTF	Universal Transformation Format
VML	Vector Markup Language
WAN	Wide Area Network
XHTML	Extensible Hypertext Markup Language
XML	Extensible Markup Language
XSL	Extensible Stylesheet Language
WAP	Wireless Access Protocol
.wma	Window Media Audio
.wmf	Windows Metafile Format
.wmv	Window Media Video
WSDL	Web Services Description Language
WS-I	Web Services Interoperability Organisation
W3C	World Wide Web Consortium

Appendix B: Glossary of Metadata Terms

Category List   The simplest type of controlled vocabulary is a high-level categorisation (or classification) scheme. At the time of input, one or more categories must be selected from the scheme and added to the document metadata. At the time of seeking information, the user does not have to think of keywords, but simply browses the list of categories and subcategories.

Element   One of the items that collectively form a metadata structure. Common elements are 'title', 'creator', 'date', and 'publisher'. Dividing data into elements allows users to carry out more accurate searches by searching on one element only. For instance, when looking for documents by Jennifer Green, searching the 'creator' field only will retrieve items by Jennifer Green only. It avoids items where the word 'green' appears in other contexts, as a subject, location etc.

Element Refinement A sub-set of an element, to make the meaning narrower or more specific, e.g. 'Date created', 'Date destroyed' as refinements of 'Date'. A refined element shares the meaning of the unrefined element, but with a more restricted scope. A user who does not understand a specific element refinement term should be able to ignore the refinement and treat the metadata value as if it were the broader element, although this will lose some precision. The definitions of element refinement terms must be freely available.

Encoding Scheme A scheme that controls the content, or 'value' of an element or element refinement, in order to clarify the meaning or improve resource discovery. These schemes include controlled vocabularies and formal notations or parsing rules. A value expressed using an encoding scheme will thus be a token selected from a controlled vocabulary (e.g. a term from a classification system or set of subject headings) or a string formatted in accordance with a formal notation (e.g., "2000-01-01" as the standard expression of a date). Encoding schemes are designed to be interpreted by machines or by human readers.

The definitive description of an encoding scheme must be clearly identified and available for use by those attempting to find information as well as those creating the metadata records.

Field Commonly used in database applications to describe a space in which data of the same type is entered (e.g. 'title' or 'price'), 'field' is a similar concept to 'element'.

Information retrieval   Finding the right information. Good information retrieval methods help ensure users find everything they are looking for, and only what they are looking for.

Content Metadata A summary of information about the form and content of a resource. The term 'metadata' has been used only in the past 15 years, but has become particularly common with the popularity of the World Wide Web. The underlying concepts have been in use for as long as collections of information have been organised. Of particular interest to this Framework are the facets of metadata intended to support resource discovery and records management.

'Metadata' can also be used to describe more technical aspects of information resources; the type of information needed to transfer information from one type of computer or software application to another. 'Metadata' of this type is covered in the e-GIF.

Metadata record A full set of structured relevant metadata, comprising all relevant elements, describing one information resource. A metadata record can take many forms;
* as part of the main information resource itself, e.g. the metadata of an XML file

* a completely separate record held apart from the information resource itself and even in a different format e.g. an automated library catalogue
* an electronic file held as an extension of the main resource e.g. the 'format' files of a Word document

Qualifier   Term used to refer to both 'Element refinement' and 'Encoding schemes'. Use of this term tends to cause confusion, so it is avoided in this document.

Refinement   See Element Refinement

Resource discovery   Finding the right stuff. See Information retrieval.

Sub-element   Term sometimes used to refer to an element refinement.

Taxonomy The science of classification, traditionally used to describe a hierarchical scheme for classifying plants and animals. More recently it has been borrowed to describe a classification scheme for organising networked resources and supporting user-friendly navigation among them. Some taxonomies incorporate thesaurus features to augment the hierarchical structure.

Thesaurus   A controlled vocabulary designed to support information retrieval by guiding both the person assigning metadata and the searcher to choose the same terms for the same concept. A thesaurus conforming to ISO 2788 (=BS 5723) supports navigation and term selection by showing relationships between terms that are close in meaning.

A thesaurus can help to ensure:
* concepts are described in a consistent manner
* experienced users are easily able to refine their searches to locate information easily
* users do not need to be familiar with technical or local terminology.