Purpose of the Document

The purpose of this document is to provide some guidelines on the Enterprise Architecture standards. The rationale behind setting the standards is to ensure that models that are produced by each entity are easily understood across all government institutions.

- Enterprise Architecture within Government of Rwanda
- Enterprise Architecture Standards

Enterprise Architecture within Government of Rwanda

Enterprise architecture is not widely applied within the government of Rwanda. The government has, however, recognised the need to not only introduce the practice across all entities, but also ensure its application with the end goal of bringing alignment and integration across all entities.

To achieve this, the government through Rwanda Information Society Authority (RISA) has procured Sparx Enterprise Architect as a CASE tool for documenting architecture artefacts across all government entities. The rationale behind the use of a CASE tool such as Sparx Enterprise Architect is to make use of its shared objective repository that does not only allow for concurrent users to share the objects but also removes the risk of creating redundancies. In addition, the features in Sparx Enterprise Architect allow for impact assessment before changes are made in an environment.

Enterprise Architecture Standards

The standards that apply for enterprise architecture apply for different areas. These include:

1. Naming convention – there needs to be an agreed upon naming convention of artefacts to facilitate re-use of objects.
2. Tools for developing deliverables – to ensure effective collaboration across entities, there needs to be a standard use of tools which will enable sharing and re-use of models
3. Definition of attributes – an understanding of each object that is created in the repository needs to be the same across all entities. This is enforced through adherence of the set of attributes that should be captured for each entity.

Naming Convention Standards

There are more added advantages to be gained from the use powerful features within a tool such as Sparx Enterprise Architect. However, these powerful features need to be enhanced with the implementation of set standards that will ensure seamless alignment of artefacts as well as enabling re-use.

Needless to say, an object or artefact is only available for re-use once it has been created within the tool. However, the challenge with CASE tools is that the repository does not have the in-built intelligence to create the relationship between different objects with similar names. In this case therefore, the naming convention is important because the repository is case sensitive. For example, these objects are different.

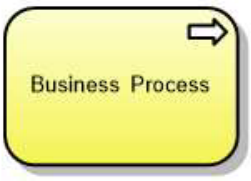
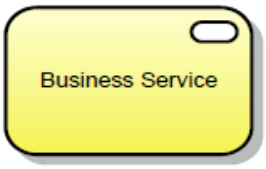
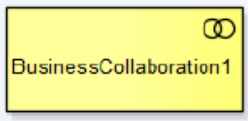
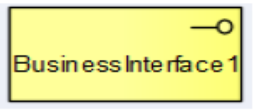
Although the entities above have the same name, the spelling itself gives the entity its own unique identity. Sparx Enterprise Architect will identify ‘Customer’ with a capital “C” as a separate entity from ‘customer’ (the name written in lower case) and ‘CUSTOMER’ (written in upper case), etc.

To enable reuse of the objects, it is therefore imperative that specific standards be adhered to when creating artifacts/entities to ensure that they are available for reuse.

The following naming conversion is therefore recommended.

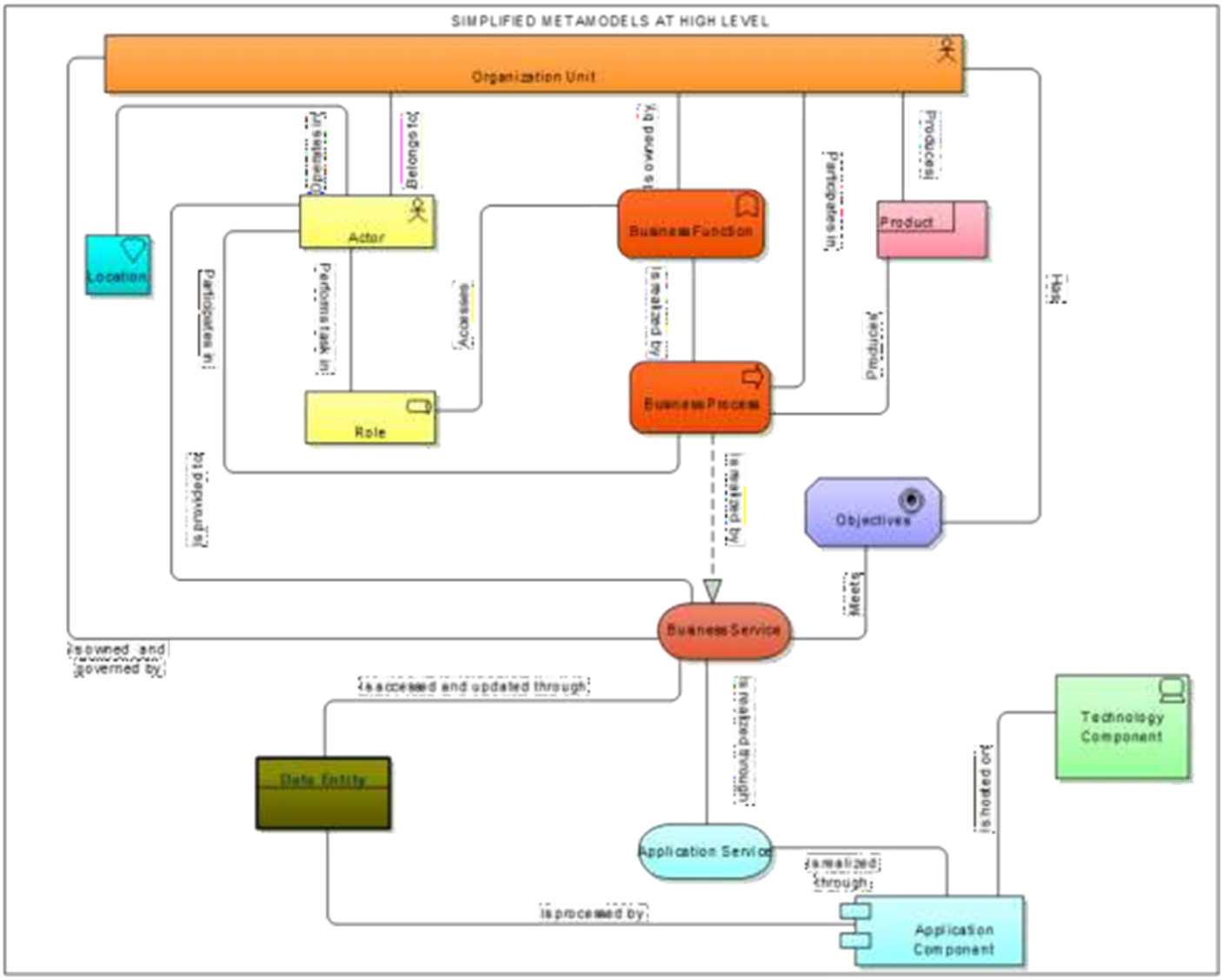
For each name, only the first letter of each word should be in capital letters, e.g., Customer, Manager, Human Resource Management, Financial Officer, Customer Acceptance Form

Tabulated below is the proposed naming conversion for entities, processes, etc.

Artifact	Symbol type	Name (example)
Entity / Actor		Customer, Manager, Finance Department, Minister of Justice / Justice Minister, Patient, Citizen etc
Business Process		Change Request, Approve Requisition, Refer for Approval
Business Function		Human Resources Management, Financial Management, Operations Management etc.
Business Event		Customer Applies for ID, Citizen Applies for ID, Customer Requests Service
Business Service		Issue ID, Process Visa Application, Process Order
Connection		Uses, Requires, Yes , No, Approved, Rejected
Business Collaboration		
Business Interface		

The above describes objects that have a relationship with each other. None of them exists in isolation. Their relationship to each other is depicted in a meta-model that has been defined for the government of Rwanda. Depicted below is a simplified meta-model highlighting the alignment and relationship between the objects.

Government of Rwanda Simplified Metadata



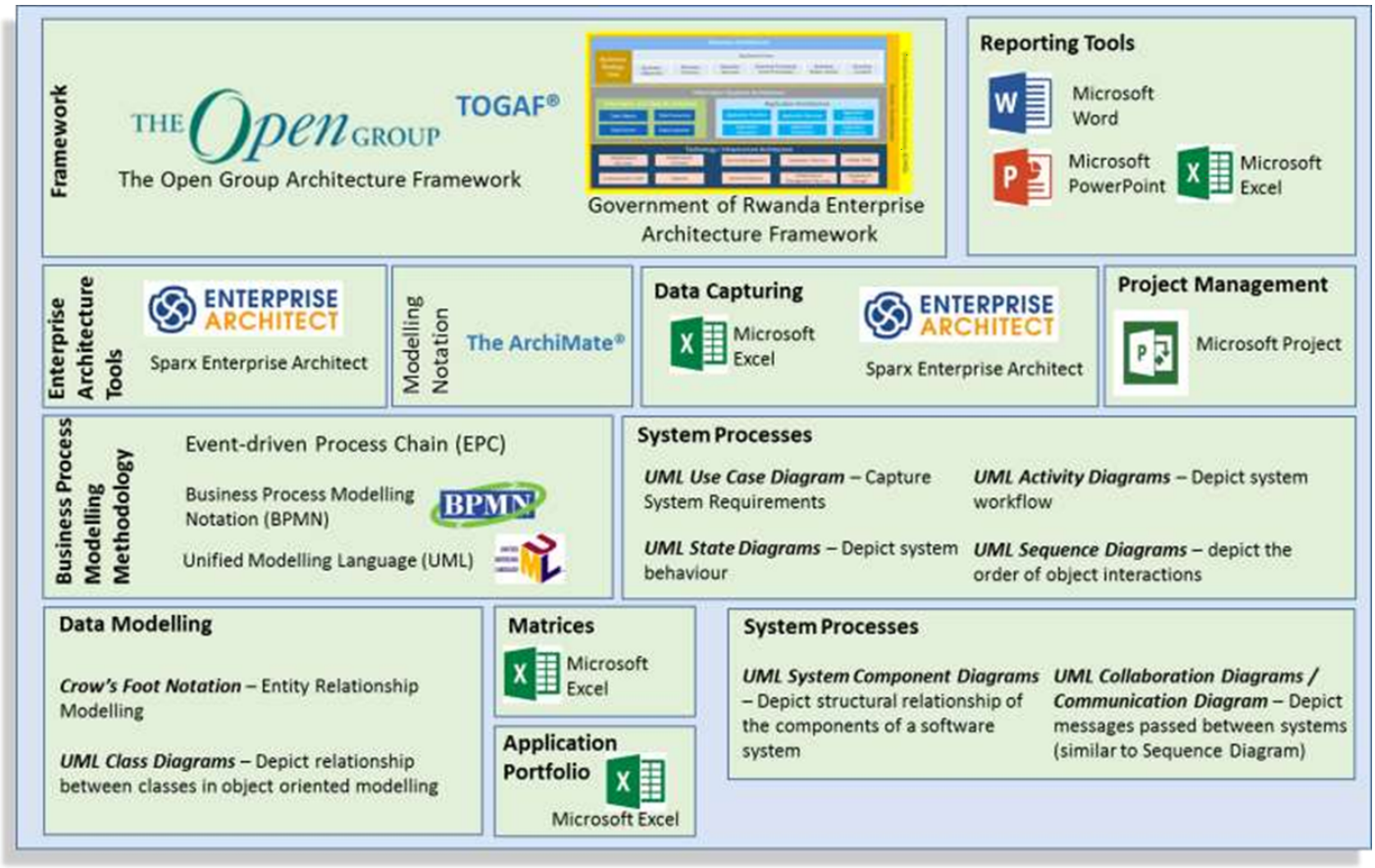
NOTE: To ensure that the team applies the naming convention properly, it is imperative that before an object is created, the user should always first look to check if it has already been created within the repository. Once it has been created, it will carry all assigned attributes whenever it is reused.

Production of the blueprints should always take into account the abovementioned relationship between objects. Thus, no object should be created in isolation of the others.

Tools Standards

In addition to the naming conversion, the following section outlines the standards that should apply with regard to the tool available for the exercise.

Depicted below are the Enterprise Architecture Standards that apply to Government of Rwanda



Asset	Standard	Comment	Rationale
Framework	TOGAF	The Government of Rwanda has selected The Open Group Architecture Framework (TOGAF) for enterprise architecture implementation. The reasoning behind selection of TOGAF is because of its completeness in covering end-to-end enterprise architecture.	Completeness of the framework provides a lot of guidance on how to architect an enterprise
	Government of Rwanda Enterprise Architecture Framework	TOGAF has been modified to suit the specific needs of government of Rwanda. This has resulted in the development of the Government of Rwanda Enterprise Architecture Framework	Modified to suit the needs of government of Rwanda
Enterprise Architecture Tool	Sparx Enterprise Architect	The tool utilizes a shared object repository which allows for re-use of object across different models.	Multiple concurrent users can access the repository and re-use objects
Modelling Notation	ArchiMate	The Notation makes it easier to design and read models	It is aligned to TOGAF
Business Process Modelling Methodology	Event-driven Process Chain (EPC)	Powerful and yet easy to read models developed using this methodology	Widely used modelling methodology
	Business Process Modelling Notation (BPMN)	Used in conjunction with the EPC model, makes business process modelling very easy to understand with the use of swimlanes	Widely used modelling methodology
	Unified Modelling Language (UML)	UML State Diagrams – used to model system processes UML Class Diagrams – used to model data objects, tables. Generates schemas for tables in a databases	Widely used modelling methodology

Asset	Standard	Comment	Rationale
Data Modeling Notation	Crow's Foot Notation	Data modelling notation that makes entity relationship diagrams easy to read	Widely used modelling methodology
Data Capturing	Microsoft Excel	Ease of use	Extensible
	Sparx Enterprise Architect	The tool utilizes a shared object repository which allows for re-use of object across different models.	Multiple concurrent users can access the repository and re-use objects
Project Management	Microsoft Project	Ease of use, all entities already have licences and therefore facilitates sharing and understanding of project plans	
Reporting Tools	Microsoft Word	Ease of use, all entities already have licences and therefore facilitates sharing and understanding of documentation	
	Microsoft Excel		
	Microsoft PowerPoint		
Application Portfolio Management	Microsoft Excel		
	Sparx Enterprise Architect	The tool utilizes a shared object repository which allows for re-use of object across different models.	Multiple concurrent users can access the repository and re-use objects
Matrices	Microsoft Excel	Ease of use	

Attributes for models

Application Modelling

Application architecture modeling seeks to present a pictorial view of the application landscape within a given organization. At the core of application architecture is the interdependency and relationship between disparate systems.

The goal of application architecture is to enable informed decision-making. In this regard, therefore, the attributes that are recorded for application architecture are crucial. They must cover a wide area and present information from different perspectives.

The captured information and attributes about any application must include—but not be limited to—the following:

Attributes	Symbol	Example
Application Name	N/A	Water Information System (WIS)
Description	N/A	Used for capturing the volumes of water that are drawn from a dam per day and the areas where it is distributed, the impacted population...
Vendor Developer	N/A	N* Technologies
Development Language	N/A	Java
Release / Version Number	N/A	5.0.1.1
Business User	N/A	Finance, Facilities
Business Unit Owner	N/A	Finance
Purpose / Usage	N/A	HQs
Installed Locations	N/A	HQs
Age of application	N/A	3
EOL Target Date	N/A	2019
Application Integration	N/A	Y
Source Code Owner	N/A	Proprietary

Supported by	N/A	N* Technologies
Annual Maintenance Contract	N/A	$800,000.00
Contract Renewal Date	N/A	21 Sept 2019
Application Development Environment	N/A	UAT, Production
Server/Hardware	N/A	SUN Solaris UNIX, Microsoft
Server OS	N/A	Sequel Server 2003
Client UI Platform	N/A	Windows
Database Type	N/A	Sql Server 2005
Database Size (in GB)	N/A	25
Comment	N/A	Web Content Management System. Release 1 scheduled for 2018/02/28. Hosted on 3rd party web server because in-house PHP / CMS support is not available

NOTE: A distinction should be made between application and software architecture. Application architecture looks at the relationship between different applications and their modules, while software architecture concentrates on the make-up of a specific application.

The deliverables from the application architecture exercise include the following:

Business Process Modelling

Business processes describe the activities that an entity undertakes in delivering a service to customers. Within the public sector, the customer will include a citizen, patient (at a hospital or clinic), another government institution (e.g. a Ministry would have local government offices and agencies as some of its customers), private entities, etc.

The process that the public entity executes in the delivery of service must be clearly defined. Tabulated below are some of the attributes that should be captured for each process.

Attributes	Symbol	Example
Process Name	N/A	Register Voter
Description	N/A	A citizen who is eligible to vote needs to trigger the process. They must apply for registration through completion of the voter registration form, present a form of identification and residential details....
Comment	N/A	This process applies to both new voters and ones who have relocated from their previous residential areas. A new voter will be a citizen who has attain the legal age to vote or an individual who has qualified for citizenship and is eligible to vote