eViP Application Profile and evaluation report on
third party tools and services.

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eViP

eViP Application Profile and evaluation report on third party tools and services.

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Background

This report is divided into two parts:

Part A – eViP application profile. As agreed by the entire project team.

Part B – Evaluation report on third party tools and services. As agreed by the entire project team to support the eViP application profile

Part A – eViP application profile:

Introduction

The eViP profile consists of:

- Schemas that defines how to encode Virtual Patients using xml.
- A specification of how to package the Virtual Patient.
- Requirements for conformance with the eViP profile.

The current version is: 1.0
Updates of the eViP profile will be considered (1-2 times/year), during the whole duration of the project lifecycle, based on recommendations from the eViP technical reference group.

Schemas

The schemas are based on the Medbiquitous Virtual Patient specification version 0.46
A set of UML class diagrams summarize the VPD, DAM, and AM schemas and their relations (umlvpd_dam_am_v3.pdf).
See enclosed xsd files for details regarding how to encode the Virtual Patient content.

- Virtual Patient Data (Available in Annex A)

- Data Availability Model (Available in Annex B)

- Activity Model (Available in Annex C)

Package

The Virtual Patient is packaged as a folder and distributed as a file-archive in a standard zip-format.

Folder structure:

ROOT
+ - imscp_v1p1.xsd
+ - imsmanifest.xml
+ - dataavailabilitymodel.xsd
+ - dataavailabilitymodel.xml

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+ - virtualpatientdata.xsd
+ - virtualpatientdata.xml
+ - activitymodel.xsd
+ - activitymodel.xml
+ + media
  + - image1.jpg
  + - image2.jpg

Conformance Metrics

Conformance testing, sometimes also called compliance testing, is the process of verifying whether a VP system meets the eViP profile standard specifications. In the process, conformance testing identifies bugs in the import/export tool, and once those bugs are eliminated, conformance testing can verify that the fixes were successful and within the applicable standards. We will also use the conformance/compliance testing results to prove to the other partners that a specific VP system is interoperable with the other eViP VP systems with regard to the VPs that are exported.

Levels of conformance

Level 1 - Package validation
The archive structure and content conforms with the eViP profile specifications

Level 2 - XML/XSD validation
The XML files are valid and well-formed relative to their schemas

Level 3 - Import validation
Import of a VP will unpack relatively meaningfully in a level 3 compliant player/authoring system.

Level 4 - Runtime validation
An imported VP will run as intended and in a meaningful way.

Part B – Evaluation report on third party tools and services:

Introduction

The overall objective of the eViP project is to create a shared bank of virtual patients (VPs) for the improved quality and efficiency of healthcare education across the European Union. A first effort toward this goal will be to collate VPs from the eViP partners' existing collections. These collections are today stored in five different VP systems. At the start of the project, there was no common framework that would allow the VPs to be shared between the different systems which resulted in the need to investigate standards that would enable interoperability and reusability of VPs across the different VP systems.

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Third party tools and services

Some of the third party tools and services investigated and used by the eViP technical reference group are listed below

Interoperability Standards

There are existing standards and specifications that may prove useful in developing a consistent framework for virtual patients.

Interoperability in Healthcare Standards

- HL7 Reference Information Model (RIM) - http://www.hl7.org/Library/data-model/RIM/modelpage_mem.htm

- High Level Architecture (HLA) – https://www.dmso.mil/public/transition/hla/

- DICOM http://medical.nema.org/

- IHE Technical Frameworks http://www.ihe.net/Technical_Framework/

Interoperability in E-learning Standards

- Shareable Content Object Reference Model (SCORM) – http://www.adlnet.gov/scorm/

- The IMS content framework - http://www.imsglobal.org/content/packaging/cpv1p1p2/imscp_bestv1p1p2.html

- Medbiquitous Virtual Patient standard - http://www.medbiq.org/working_groups/virtual_patient/index.html

- Dublin Core Metadata Initiative - http://www.dublincore.org

- Educational Modeling Language - http://www.learningnetworks.org/?q=EML

Testing for conformance/compliance

Different approaches could be adopted to test that a VP systems' implementation of the eViP application profile fulfills all mandatory elements as specified.

One approach is to use third party tools and online services to validate the xml files. Example of such tools are:

- XMLSpy http://www.altova.com/products/xmlspy/create_valid_xml_validation.html

- OpenXML http://www.stylusstudio.com/xml_parsers.html

- STG XML Validation Form http://www.stg.brown.edu/service/xmlvalid/

- Liquid XML Studio (freeware) http://www.liquid-technologies.com/

- <oXygen/> XML Editor http://www.oxygenxml.com/

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- Scorm conformance test suite http://www.adlnet.gov/scorm/20043ED/cts.aspx

Development of new repositories or referatories

Off-the-shelf software for repositories creation is available on the Internet:

- DSpace http://wiki.dspace.org/index.php/EndUserFaq

In case a custom-made repository system for storing VPs is needed, application of XML database management systems may be considered.

There are two main approaches for XML in databases:

- native XML databases - e.g.

    o eXist http://exist.sourceforge.net

    o xindice http://xml.apache.org/xindice

    o Software AG Tamino http://softwareag.com/tamino

- XML-enabled relational databases

    o overview of XML-enabled RDBMS
      http://www.rpbourret.com/xml/ProdsXMLEnabled.htm

Existing suitable repositories

Usage of existing e-learning repositories for storing VPs is also taken into account

- International

    o IVIMEDS http://www.ivimeds.org/

    o Merlot http://http://www.merlot.org/

- National

    o JORUM http://www.jorum.ac.uk

    o CasePort http://www.caseport.de

    o Careo http://www.ucalgary.ca/commons/careo/CAREOrepo.htm

XML APIs

- Dom4J - Java XML Framework http://www.dom4j.org

- Xerces - XML Parser http://xerces.apache.org

- Xalan - XSLT processor http://xalan.apache.org

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- Saxon - XSLT and XQuery Processor http://saxon.sourceforge.net

- Jaxen - Universal Java XPath Engine http://jaxen.codehaus.org

- SWORD - Simple Web-service Offering Repository Deposit API
  http://www.ukoln.ac.uk/repositories/digirep/index/SWORD

Other tools

- RELOAD Editor - enables users to organise, aggregate and package learning objects
  in standard IMS and SCORM content packages http://www.reload.ac.uk/editor.html

Conclusion

The emerging Medbiquitous Virtual Patient standard seems to be a viable option to build on
since it is being specifically developed to enable interoperability, accessibility and reusability
of web-based virtual patient learning content and it also integrates the best of the other
standards such as IMS for the packaging of the VPs.

The review of third party tools and services indicated that the project could benefit from
experiences and work already available.

Annexes:

Annex A - Virtual Patient Data

Annex B – Data Availability Model

Annex C – Activity Model

Annex D – Project plan for deliverable 2.1

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Annex A - Virtual Patient Data

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```xml
<?xml version="1.0" encoding="UTF-8"?>

<!-- edited with XMLSpy v2008 (http://www.altova.com) by Ben Azan (Johns Hopkins University) -->

<!--Generated by Turbo XML 2.4.0.100. Conforms to w3c http://www.w3.org/2001/XMLSchema-->

<xsd:schema xmlns="http://ns.medbiq.org/virtualpatientdata/v1/"
xmlns:xhtml="http://www.w3.org/1999/xhtml" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://ns.medbiq.org/virtualpatientdata/v1/" elementFormDefault="qualified"
attributeFormDefault="unqualified">

        <xsd:import namespace="http://www.w3.org/1999/xhtml" schemaLocation="xhtml1-
strict.xsd"/>

        <!--Copyright 2007, MedBiquitous Consortium. All rights reserved. http://www.medbiq.org-->

        <!--Modified 11 February 2008-->

        <xsd:element name="VirtualPatientData" type="VirtualPatientDataType"/>

        <xsd:complexType name="VirtualPatientDataType">

                <xsd:sequence>

                        <xsd:element name="PatientDemographics" type="PatientDemographicsType"
minOccurs="0"/>

                        <xsd:element name="VPDText" type="VPDTextType" minOccurs="0"
maxOccurs="unbounded"/>

                        <xsd:element name="Medication" type="MedicationType" minOccurs="0"
maxOccurs="unbounded"/>

                        <xsd:element name="InterviewItem" type="InterviewItemType"
minOccurs="0" maxOccurs="unbounded"/>

                        <xsd:element name="PhysicalExam" type="PhysicalExamType"
minOccurs="0" maxOccurs="unbounded"/>

                        <xsd:element name="DiagnosticTest" type="DiagnosticTestType"
minOccurs="0" maxOccurs="unbounded"/>

                        <xsd:element name="Diagnosis" type="DiagnosisType" minOccurs="0"
maxOccurs="unbounded"/>

                        <xsd:element name="Intervention" type="InterventionType" minOccurs="0"
maxOccurs="unbounded"/>

                        <xsd:element name="Organization" type="OrganizationType"
minOccurs="0"/>

                </xsd:sequence>

        </xsd:complexType>

        <xsd:simpleType name="NonNullString">

                <xsd:restriction base="xsd:string">

                        <xsd:minLength value="1"/>

                </xsd:restriction>
```

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```
        </xsd:simpleType>

        <xsd:simpleType name="ProximalOrDistalType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="Proximal"/>

                        <xsd:enumeration value="Distal"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="RightOrLeftType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="Right"/>

                        <xsd:enumeration value="Left"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="FrontOrBackType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="Front"/>

                        <xsd:enumeration value="Back"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="InferiorOrSuperiorType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="Inferior"/>

                        <xsd:enumeration value="Superior"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="SexType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="Male"/>

                        <xsd:enumeration value="Female"/>

                        <xsd:enumeration value="Indeterminate"/>

                </xsd:restriction>

        </xsd:simpleType>
```

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```xml
<xsd:simpleType name="AppropriatenessType">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="always"/>
        <xsd:enumeration value="ok"/>
        <xsd:enumeration value="never"/>
        <xsd:enumeration value="none"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="LikelihoodType">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="high"/>
        <xsd:enumeration value="medium"/>
        <xsd:enumeration value="low"/>
        <xsd:enumeration value="none"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="TextType">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="chief complaint"/>
        <xsd:enumeration value="history"/>
        <xsd:enumeration value="problem"/>
        <xsd:enumeration value="allergy"/>
        <xsd:enumeration value="narrative"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="TrueFalseType">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="true"/>
        <xsd:enumeration value="false"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="InterviewItemType">
```

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```xml
            <xsd:sequence>
                    <xsd:element name="Question" type="NonNullString"/>
                    <xsd:element name="Response" type="NonNullString"/>
                    <xsd:element name="Media" type="MediaType" minOccurs="0"/>
            </xsd:sequence>
            <xsd:attribute name="id" type="xsd:string"/>
    </xsd:complexType>
    <xsd:complexType name="VPDTextType">
            <xsd:sequence>
                    <xsd:element ref="xhtml:div"/>
            </xsd:sequence>
            <xsd:attribute name="id" type="xsd:string"/>
            <xsd:attribute name="textType" type="TextType"/>
    </xsd:complexType>
    <xsd:complexType name="PhysicalExamType">
            <xsd:sequence>
                    <xsd:element name="ExamName" type="NonNullString"/>
                    <xsd:element name="LocationOnBody" type="LocationOnBodyType"
minOccurs="0"/>
                    <xsd:element name="Action" type="NonNullString" minOccurs="0"/>
                    <xsd:element name="Finding" type="NonNullString"/>
                    <xsd:element name="Description" type="NonNullString"/>
                    <xsd:element name="Media" type="MediaType" minOccurs="0"/>
            </xsd:sequence>
            <xsd:attribute name="id" type="xsd:string"/>
    </xsd:complexType>
    <xsd:complexType name="DiagnosticTestType">
            <xsd:sequence>
                    <xsd:element name="TestName" type="NonNullString"/>
                    <xsd:element name="Unit" type="NonNullString"/>
                    <xsd:element name="Result" type="NonNullString"/>
                    <xsd:element name="Normal" type="NonNullString"/>
```

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```xml
                        <xsd:element name="Media" type="MediaType" minOccurs="0"/>

                </xsd:sequence>

                <xsd:attribute name="id" type="xsd:string"/>

        </xsd:complexType>

        <xsd:complexType name="DiagnosisType">

                <xsd:sequence>

                        <xsd:element name="DiagnosisName" type="NonNullString"/>

                        <xsd:element name="Likelihood" type="LikelihoodType" minOccurs="0"/>

                </xsd:sequence>

                <xsd:attribute name="id" type="xsd:string"/>

                <xsd:attribute name="authorDiagnosis" type="TrueFalseType"/>

        </xsd:complexType>

        <xsd:complexType name="InterventionType">

                <xsd:sequence>

                        <xsd:element name="InterventionName" type="NonNullString"/>

                        <xsd:element name="Medication" type="MedicationType" minOccurs="0"/>

                        <xsd:element name="Appropriateness" type="AppropriatenessType"
minOccurs="0"/>

                        <xsd:element name="Results" type="NonNullString" minOccurs="0"/>

                        <xsd:element name="Media" type="MediaType" minOccurs="0"/>

                </xsd:sequence>

                <xsd:attribute name="id" type="xsd:string"/>

        </xsd:complexType>

        <xsd:complexType name="MedicationType">

                <xsd:sequence>

                        <xsd:element name="MedicationName">

                                <xsd:complexType>

                                        <xsd:simpleContent>

                                                <xsd:extension base="NonNullString">

                                                        <xsd:attribute name="source"
type="xsd:string"/>

                                                        <xsd:attribute name="sourceid"
type="xsd:string"/>
```

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```xml
                                </xsd:extension>

                            </xsd:simpleContent>

                        </xsd:complexType>

                    </xsd:element>

                    <xsd:element name="Dose" type="NonNullString"/>

                    <xsd:element name="Route" type="NonNullString"/>

                    <xsd:element name="Frequency" type="NonNullString"/>

                </xsd:sequence>

                <xsd:attribute name="id" type="xsd:string"/>

            </xsd:complexType>

            <xsd:complexType name="LocationOnBodyType">

                <xsd:sequence>

                    <xsd:element name="BodyPart">

                        <xsd:complexType>

                            <xsd:simpleContent>

                                <xsd:extension base="NonNullString">

                                    <xsd:attribute name="source"
type="xsd:string"/>

                                    <xsd:attribute name="sourceid"
type="xsd:string"/>

                                </xsd:extension>

                            </xsd:simpleContent>

                        </xsd:complexType>

                    </xsd:element>

                    <xsd:element name="ProximalOrDistal" type="ProximalOrDistalType"
minOccurs="0"/>

                    <xsd:element name="RightOrLeft" type="RightOrLeftType"
minOccurs="0"/>

                    <xsd:element name="FrontOrBack" type="FrontOrBackType"
minOccurs="0"/>

                    <xsd:element name="InferiorOrSuperior" type="InferiorOrSuperiorType"
minOccurs="0"/>

                </xsd:sequence>

            </xsd:complexType>

            <xsd:complexType name="PatientDemographicsType">
```

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```xml
            <xsd:sequence>

                    <xsd:element name="CoreDemographics" type="CoreDemographicsType" minOccurs="0"/>

                    <xsd:element name="DemographicCharacteristic" type="DemographicCharacteristicType" minOccurs="0" maxOccurs="unbounded"/>

            </xsd:sequence>

            <xsd:attribute name="id" type="xsd:string"/>

        </xsd:complexType>

        <xsd:complexType name="DemographicCharacteristicType">

            <xsd:sequence>

                    <xsd:element name="Title" type="NonNullString"/>

                    <xsd:element name="Description" type="NonNullString" minOccurs="0"/>

            </xsd:sequence>

            <xsd:attribute name="id" type="xsd:string"/>

        </xsd:complexType>

        <xsd:complexType name="CoreDemographicsType">

            <xsd:sequence>

                    <xsd:element name="PatientID" type="NonNullString" minOccurs="0"/>

                    <xsd:element name="Name" type="NonNullString" minOccurs="0"/>

                    <xsd:element name="Age" type="xsd:duration" minOccurs="0"/>

                    <xsd:element name="Sex" type="SexType" minOccurs="0"/>

                    <xsd:element name="Race" type="NonNullString" minOccurs="0" maxOccurs="unbounded"/>

                    <xsd:element name="Species" type="NonNullString" minOccurs="0"/>

                    <xsd:element name="Breed" type="NonNullString" minOccurs="0"/>

            </xsd:sequence>

            <xsd:attribute name="id" type="xsd:string"/>

        </xsd:complexType>

        <xsd:complexType name="MediaType">

            <xsd:sequence>

                    <xsd:element name="MediaID" type="MediaIDType"/>

                    <xsd:element name="Location" type="NonNullString"/>

            </xsd:sequence>
```

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```
        </xsd:complexType>

        <xsd:complexType name="ItemType">

                <xsd:complexContent>

                        <xsd:extension base="xsd:anyType">

                                <xsd:attribute name="id" type="xsd:string"/>

                                <xsd:attribute name="label" type="xsd:string"/>

                                <xsd:attribute name="source" type="xsd:string"/>

                                <xsd:attribute name="sourceID" type="xsd:string"/>

                        </xsd:extension>

                </xsd:complexContent>

        </xsd:complexType>

        <xsd:complexType name="SectionType">

                <xsd:choice maxOccurs="unbounded">

                        <xsd:element name="Item" type="ItemType"/>

                        <xsd:element name="Section" type="SectionType"/>

                </xsd:choice>

        </xsd:complexType>

        <xsd:complexType name="OrganizationType">

                <xsd:choice maxOccurs="unbounded">

                        <xsd:element name="Item" type="ItemType"/>

                        <xsd:element name="Section" type="SectionType"/>

                </xsd:choice>

        </xsd:complexType>

        <xsd:simpleType name="MediaIDType">

                <xsd:restriction base="xsd:string">

                        <xsd:pattern
value="\s*/manifest/resources/resource\[@identifier\s?=\s?'.*'\]\s*"/>

                </xsd:restriction>

        </xsd:simpleType>

</xsd:schema>
```

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Annex B – Data Availability Model

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```xml
<?xml version="1.0" encoding="UTF-8"?>

<!-- edited with XMLSpy v2006 sp2 U (http://www.altova.com) by Valerie Smothers (Johns Hopkins University, SOM) -->

<!--Generated by Turbo XML 2.4.0.100. Conforms to w3c http://www.w3.org/2001/XMLSchema-->

<xsd:schema xmlns="http://ns.medbiq.org/dataavailabilitymodel/v1/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:vpd="http://ns.medbiq.org/virtualpatientdata/v1/"
targetNamespace="http://ns.medbiq.org/dataavailabilitymodel/v1/" elementFormDefault="qualified"
attributeFormDefault="unqualified">

        <!--Copyright 2007, MedBiquitous Consortium. All rights reserved. http://www.medbiq.org-->

        <!--Modified 08 February 2008-->

        <xsd:element name="DataAvailabilityModel" type="DataAvailabilityModelType"/>

        <xsd:simpleType name="NonNullString">

                <xsd:restriction base="xsd:string">

                        <xsd:minLength value="1"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="DisplayType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="immediately"/>

                        <xsd:enumeration value="ontrigger"/>

                        <xsd:enumeration value="delayed"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:complexType name="DataAvailabilityModelType">

                <xsd:sequence>

                        <xsd:element name="DAMNode" type="DAMNodeType"
maxOccurs="unbounded"/>

                </xsd:sequence>

        </xsd:complexType>

        <xsd:complexType name="DAMNodeType">

                <xsd:sequence>

                        <xsd:element name="DAMNodeLabel" type="NonNullString"
minOccurs="0"/>
```

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```
                    <xsd:element name="DAMNodeItem" type="DAMNodeItemType"
maxOccurs="unbounded"/>

            </xsd:sequence>

            <xsd:attribute name="id" type="xsd:string"/>

        </xsd:complexType>

        <xsd:complexType name="DAMNodeItemType">

            <xsd:sequence>

                    <xsd:element name="ItemID" type="NonNullString"/>

                    <xsd:element name="ItemComment" type="DAMNodeReferenceType"
minOccurs="0"/>

                    <xsd:element name="DAMNodeID" type="DAMNodeReferenceType"
minOccurs="0" maxOccurs="unbounded"/>

                    <xsd:element name="ItemOrder" type="xsd:integer" minOccurs="0"/>

            </xsd:sequence>

            <xsd:attribute name="display" type="DisplayType"/>

        </xsd:complexType>

        <xsd:simpleType name="DAMNodeReferenceType">

            <xsd:restriction base="xsd:string">

                    <xsd:pattern
value="\s*/DataAvailabilityModel/DAMNode\[@id\s?=\s?'.*'\]\s*"/>

            </xsd:restriction>

        </xsd:simpleType>

</xsd:schema>
```

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Annex C – Activity Model

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```
<?xml version="1.0" encoding="UTF-8"?>

<!--Generated by Turbo XML 2.4.0.100. Conforms to w3c http://www.w3.org/2001/XMLSchema-->

<xsd:schema xmlns="http://ns.medbiq.org/activitymodel/v1/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://ns.medbiq.org/activitymodel/v1/" elementFormDefault="qualified"
attributeFormDefault="unqualified">

        <!--Modified 08 February 2008-->

        <xsd:element name="ActivityModel" type="ActivityModelType"/>

        <xsd:simpleType name="NonNullString">

                <xsd:restriction base="xsd:string">

                        <xsd:minLength value="1"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="RelationsType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="eq"/>

                        <xsd:enumeration value="neq"/>

                        <xsd:enumeration value="leq"/>

                        <xsd:enumeration value="lt"/>

                        <xsd:enumeration value="geq"/>

                        <xsd:enumeration value="gt"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="RuleFunctionType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="stop"/>

                        <xsd:enumeration value="showMessageOnly"/>

                        <xsd:enumeration value="restart"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="OnOffType">

                <xsd:restriction base="xsd:string">

                        <xsd:enumeration value="On"/>

                        <xsd:enumeration value="Off"/>

                </xsd:restriction>

        </xsd:simpleType>

        <xsd:simpleType name="TimerDirectionType">
```

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```xml
            <xsd:restriction base="xsd:string">
                    <xsd:enumeration value="up"/>
                    <xsd:enumeration value="down"/>
            </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType name="CounterOperatorType">
            <xsd:restriction base="xsd:string">
                    <xsd:enumeration value="+"/>
                    <xsd:enumeration value="-"/>
                    <xsd:enumeration value="="/>
            </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType name="WeightingType">
            <xsd:restriction base="xsd:integer">
                    <xsd:maxInclusive value="100"/>
            </xsd:restriction>
    </xsd:simpleType>
    <xsd:complexType name="ActivityModelType">
            <xsd:sequence>
                    <xsd:element name="Properties" type="PropertiesType" minOccurs="0"/>
                    <xsd:element name="ActivityNodes" type="ActivityNodesType"/>
                    <xsd:element name="Links" type="LinksType" minOccurs="0"/>
            </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="PropertiesType">
            <xsd:sequence>
                    <xsd:element name="Counters" type="CountersType" minOccurs="0"/>
                    <xsd:element name="Timer" type="TimerType" minOccurs="0"/>
            </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="ActivityNodesType">
            <xsd:sequence>
                    <xsd:element name="NodeSection" type="NodeSectionType"
maxOccurs="unbounded"/>
            </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="LinksType">
```

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```
<xsd:sequence>
        <xsd:element name="Link" maxOccurs="unbounded">
                <xsd:complexType>
                        <xsd:complexContent>
                                <xsd:extension base="LinkType"/>
                        </xsd:complexContent>
                </xsd:complexType>
        </xsd:element>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CountersType">
        <xsd:sequence>
                <xsd:element name="Counter" type="CounterType" maxOccurs="unbounded"/>
        </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CounterType">
        <xsd:sequence>
                <xsd:element name="CounterLabel" type="NonNullString"/>
                <xsd:element name="CounterUnitsSuffix" type="NonNullString" minOccurs="0"/>
                <xsd:element name="CounterUnitsPrefix" type="NonNullString" minOccurs="0"/>
                <xsd:element name="CounterInitValue" type="xsd:integer"/>
                <xsd:element name="CounterRules" type="CounterRulesType" minOccurs="0"/>
        </xsd:sequence>
        <xsd:attribute name="id" type="xsd:string"/>
        <xsd:attribute name="isVisible" type="xsd:boolean"/>
</xsd:complexType>
<xsd:complexType name="CounterRulesType">
        <xsd:sequence>
                <xsd:element name="Rule" type="RuleType" maxOccurs="unbounded"/>
        </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="RuleType">
        <xsd:sequence>
                <xsd:element name="Relation" type="RelationsType"/>
```

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```xml
                <xsd:element name="Value" type="xsd:integer"/>
                <xsd:element name="RuleRedirect" type="ActivityNodeXpathType"
minOccurs="0"/>
                <xsd:element name="RuleMessage" type="NonNullString" minOccurs="0"/>
            </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="TimerType">
        <xsd:sequence>
                <xsd:element name="TimerDeltaSeconds" type="xsd:integer"/>
                <xsd:element name="TimerDirection" type="TimerDirectionType"/>
                <xsd:element name="TimerRules" type="CounterRulesType"
minOccurs="0"/>
            </xsd:sequence>
            <xsd:attribute name="isVisible" type="xsd:boolean"/>
    </xsd:complexType>
    <xsd:complexType name="ActivityNodeType">
        <xsd:sequence>
                <xsd:element name="Content" type="ContentType"/>
                <xsd:element name="Rules" type="RulesType" minOccurs="0"/>
                <xsd:element name="Services" type="ServicesType" minOccurs="0"/>
            </xsd:sequence>
            <xsd:attribute name="id" type="xsd:string"/>
            <xsd:attribute name="label" type="xsd:string"/>
    </xsd:complexType>
    <xsd:complexType name="NodeSectionType">
        <xsd:sequence>
                <xsd:element name="ActivityNode" type="ActivityNodeType"
maxOccurs="unbounded"/>
            </xsd:sequence>
            <xsd:attribute name="id" type="xsd:string"/>
            <xsd:attribute name="label" type="xsd:string"/>
    </xsd:complexType>
    <xsd:complexType name="RulesType">
        <xsd:sequence>
                <xsd:element name="CounterActionRule" type="CounterActionRuleType"
minOccurs="0" maxOccurs="unbounded"/>
                <xsd:element name="Probability" type="OnOffType" minOccurs="0"/>
```

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```xml
                <xsd:element name="ConditionalRule" type="ConditionalRuleType" minOccurs="0"/>
                <xsd:element name="NavigateGlobal" type="OnOffType" minOccurs="0"/>
            </xsd:sequence>
        </xsd:complexType>
        <xsd:complexType name="CounterActionRuleType">
            <xsd:sequence>
                <xsd:element name="CounterOperator" type="CounterOperatorType"/>
                <xsd:element name="CounterRuleValue" type="xsd:integer"/>
                <xsd:element name="CounterID" type="CounterIDType"/>
            </xsd:sequence>
        </xsd:complexType>
        <xsd:complexType name="ServicesType">
            <xsd:sequence>
                <xsd:element name="Timer" type="TimerType" minOccurs="0"/>
            </xsd:sequence>
        </xsd:complexType>
        <xsd:complexType name="LinkType">
            <xsd:sequence>
                <xsd:element name="ActivityNodeA" type="ActivityNodeXpathType"/>
                <xsd:element name="ActivityNodeB" type="ActivityNodeXpathType"/>
                <xsd:element name="Weighting" type="WeightingType" minOccurs="0"/>
            </xsd:sequence>
            <xsd:attribute name="label" type="xsd:string"/>
            <xsd:attribute name="display" type="OnOffType"/>
        </xsd:complexType>
        <xsd:complexType name="ConditionalRuleType">
            <xsd:sequence>
                <xsd:element name="Operator" type="OperatorType"/>
                <xsd:element name="RuleRedirect" type="ActivityNodeXpathType" minOccurs="0"/>
                <xsd:element name="RuleMessage" type="NonNullString" minOccurs="0"/>
            </xsd:sequence>
        </xsd:complexType>
        <xsd:complexType name="OperatorType">
            <xsd:choice>
                <xsd:element name="And" type="ConditionType" minOccurs="0"/>
```

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```xml
                    <xsd:element name="Or" type="ConditionType" minOccurs="0"/>

                    <xsd:element name="Nand" type="ConditionType" minOccurs="0"/>

                    <xsd:element name="Nor" type="ConditionType" minOccurs="0"/>

            </xsd:choice>

    </xsd:complexType>

    <xsd:complexType name="ConditionType">

            <xsd:sequence>

                    <xsd:element name="Operand" type="NonNullString" minOccurs="0"
maxOccurs="unbounded"/>

                    <xsd:element name="And" type="ConditionType" minOccurs="0"
maxOccurs="unbounded"/>

                    <xsd:element name="Or" type="ConditionType" minOccurs="0"
maxOccurs="unbounded"/>

                    <xsd:element name="Nand" type="ConditionType" minOccurs="0"
maxOccurs="unbounded"/>

                    <xsd:element name="Nor" type="ConditionType" minOccurs="0"
maxOccurs="unbounded"/>

            </xsd:sequence>

    </xsd:complexType>

    <xsd:simpleType name="ContentType">

            <xsd:restriction base="xsd:string">

                    <xsd:pattern
value="\s*/DataAvailabilityModel/DAMNode\[@id\s?=\s?'.*'\]\s*"/>

            </xsd:restriction>

    </xsd:simpleType>

    <xsd:simpleType name="ActivityNodeXpathType">

            <xsd:restriction base="xsd:string">

                    <xsd:pattern
value="\s*/ActivityModel/ActivityNodes/NodeSection/ActivityNode\[@id\s?=\s?'.*'\]\s*"/>

            </xsd:restriction>

    </xsd:simpleType>

    <xsd:simpleType name="CounterIDType">

            <xsd:restriction base="xsd:string">

                    <xsd:pattern
value="\s*/ActivityModel/Properties/Counters/Counter\[@id\s?=\s?'.*'\]\s*"/>

            </xsd:restriction>

    </xsd:simpleType>
</xsd:schema>
```
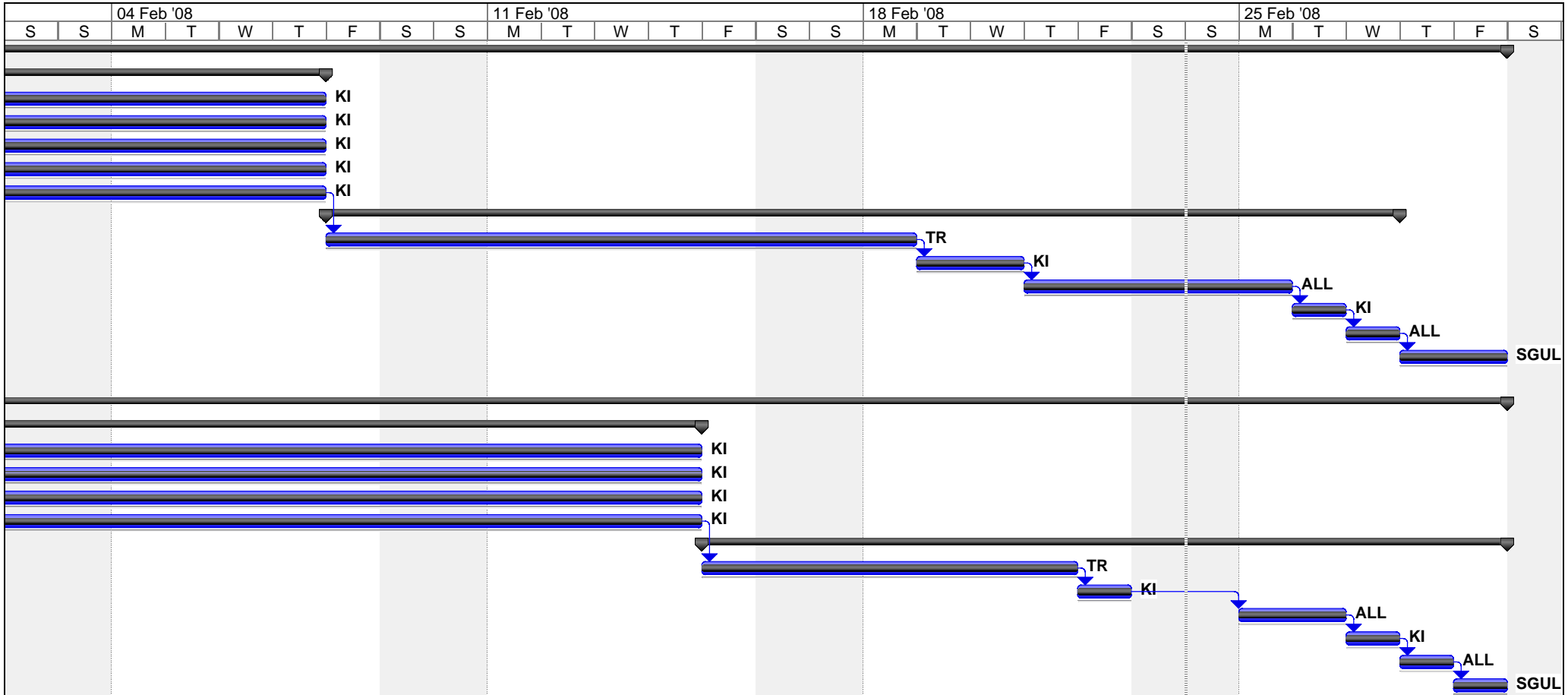
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Annex D – Project plan for deliverable 2.1

ID	ⓘ	Task Name	Duration	Start	Finish	Predecessors	Resource Names	W	T	F	S
1	✓	**Deliverable 2.1a eViP Application Profile**	**21 days**	**Fri 01/02/08**	**Fri 29/02/08**						
2	✓	**Create deliverable in wiki**	**5 days**	**Fri 01/02/08**	**Thu 07/02/08**						
3	✓	Introduction	5 days	Fri 01/02/08	Thu 07/02/08		KI				
4	✓	Schema	5 days	Fri 01/02/08	Thu 07/02/08	3SS	KI				
5	✓	Package	5 days	Fri 01/02/08	Thu 07/02/08	3SS	KI				
6	✓	Example of exported VP	5 days	Fri 01/02/08	Thu 07/02/08	3SS	KI				
7	✓	Conformance metrics	5 days	Fri 01/02/08	Thu 07/02/08	3SS	KI				
8	✓	**Review deliverable in wiki**	**14 days**	**Fri 08/02/08**	**Wed 27/02/08**						
9	✓	Technical reference group review	7 days	Fri 08/02/08	Mon 18/02/08	7	TR				
10	✓	Changes based on review	2 days	Tue 19/02/08	Wed 20/02/08	9	KI				
11	✓	Project lead review	3 days	Thu 21/02/08	Mon 25/02/08	10	ALL				
12	✓	Changes based on review	1 day	Tue 26/02/08	Tue 26/02/08	11	KI				
13	✓	Project lead sign-off	1 day	Wed 27/02/08	Wed 27/02/08	12	ALL				
14	✓	Submit deliverable	2 days	Thu 28/02/08	Fri 29/02/08	13	SGUL				
15											
16	✓	**Deliverable 2.1b Evaluation Report on Third Party Tools and Services**	**21 days**	**Fri 01/02/08**	**Fri 29/02/08**						
17	✓	**Create deliverable in wiki**	**10 days**	**Fri 01/02/08**	**Thu 14/02/08**						
18	✓	Introduction	10 days	Fri 01/02/08	Thu 14/02/08		KI				
19	✓	Third party tools and services for eViP profile	10 days	Fri 01/02/08	Thu 14/02/08	18SS	KI				
20	✓	Third party tools and services for conformance metrics	10 days	Fri 01/02/08	Thu 14/02/08	18SS	KI				
21	✓	Conclusion	10 days	Fri 01/02/08	Thu 14/02/08	18SS	KI				
22	✓	**Review deliverable in wiki**	**11 days**	**Fri 15/02/08**	**Fri 29/02/08**						
23	✓	Technical reference group review	5 days	Fri 15/02/08	Thu 21/02/08	21	TR				
24	✓	Changes based on review	1 day	Fri 22/02/08	Fri 22/02/08	23	KI				
25	✓	Project lead review	2 days	Mon 25/02/08	Tue 26/02/08	24	ALL				
26	✓	Changes based on review	1 day	Wed 27/02/08	Wed 27/02/08	25	KI				
27	✓	Project lead sign-off	1 day	Thu 28/02/08	Thu 28/02/08	26	ALL				
28	✓	Submit deliverable	1 day	Fri 29/02/08	Fri 29/02/08	27	SGUL				

Project: d2.1.mpp
Date: Sun 24/02/08

Task	▬▬▬	Milestone	◆	External Tasks	▬▬▬
Split	....	Summary	◤▬▬◥	External Milestone	◇
Progress	▬▬▬	Project Summary	◁▬▬▷	Deadline	⇩

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Task	Milestone	External Tasks
Split	Summary	External Milestone
Progress	Project Summary	Deadline

Project: d2.1.mpp
Date: Sun 24/02/08