



# RepoMMan Project

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Deliverable D-D1

Available BPEL runtime environments, evaluation criteria  
and evaluation results

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## The RepoMMan Project

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## 1. Introduction

The RepoMMan project at the University of Hull is funded under the JISC Repositories Programme and is closely aligned with the University's commitment to deploy an institutional repository by the end of July 2006.

The project has two main technical objectives. The first is to develop a standards-based, flexible, workflow tool through which users can interact with Fedora. This will be surfaced within the institutional portal and, as well as the basic repository functions, we intend that it should provide assistance both with versioning and automatic population of metadata. This will be used to provide a demonstrator in the specific area of research artefacts (shareable or private works in progress, notes, references etc) and research outputs (for example book chapters, conference papers, Electronic Theses and Dissertations (ETDs)). A further strand of our technical development will investigate and establish interfaces between the research repository and a Collaborative and Learning Environment (C&LE) deployed for inter-institutional research collaboration.

The Fedora architecture has been designed to allow for individual repository functions to be called via its APIs. Both the Fedora Management API (API-M) and Access API (API-A) can be accessed using WSDL definitions over SOAP. The creation of a workflow engine can therefore use WSBPEL (or more briefly BPEL) to define calls to one, or a number of, repository functions using the Web Services standards.

It follows from the above that an early part of RepoMMan's work was to document the available BPEL runtime environments, a set of evaluation criteria matched to the project's needs, and the results of the subsequent evaluation.

At the planning stage, the RepoMMan team had envisaged that the evaluation process might be summarised by a 'Which?'<sup>1</sup> style matrix, comparing the various products point by point. Initial investigation showed that this would not be possible without acquiring a copy of each BPEL product and testing them side by side; suppliers' websites do not provide enough information to undertake a detailed comparison. Rather, we have adopted the approach of a literature review. The comparative matrix that is provided at Appendix A summarises the information that we have found but it is incomplete to the extent that the suppliers' websites themselves provide incomplete data.

It may well be that there are BPEL runtime environments that we did not discover in our search. If readers point us to them we shall be happy to update this document.

Whilst we were drafting this document a number of suppliers changed their products and a number disappeared from the web; such is the nature of software development. Please let us know if information provided here is superseded or if we have misinterpreted the website pages for a particular product.

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<sup>1</sup> 'Which?' is a monthly subscription magazine published in the UK by Which? Ltd (formerly the Consumers' Association). Each month it takes a number of product categories and compares manufacturers' new introductions feature by feature. The independent comparisons that the magazine provides are highly regarded.

## 2. BPEL runtime environments for J2EE

This section of the document provides a summary of the BPEL engines for J2EE deployment found during August 2005.

### 2.1 ActiveBPEL LLC: ActiveBPEL Engine <sup>2</sup>

The ActiveBPEL™ engine is provided by ActiveBPEL LLC, an open source software organisation. The engine itself has been developed and is maintained by the US company Active Endpoints Inc. which uses the technology in some of its commercial products (see 2.2).

ActiveBPEL is Open Source software distributed under the GNU General Public Licence<sup>3</sup>. It "comprehensively implements the BPEL4WS 1.1 spec including the full complement of BPEL activities, event handling, exception handling and scope/compensation management." ActiveBPEL describe the product as being of "industrial strength" and stress that, as Active Endpoints use the technology themselves, there is a commitment to ongoing development incorporating contributions from the ActiveBPEL community at large.

The ActiveBPEL engine is written in Java and the BPEL XML files are dealt with as 'native'. It runs in "any standard servlet container such as Tomcat." The software is tested on Tomcat 5.x.

ActiveBPEL LLC provides a comprehensive website which offers, amongst other things, details of the ActiveBPEL architecture, a developer's guide, a user guide, installation and deployment notes, a tutorial and samples. Support through the site includes a user forum, mailing lists and a bug tracker. The site also provides a BPEL validation service. New point.point releases (1.1.1, 1.1.2 etc) are released every fortnight with full release notes.

The engine does not come with a visual authoring package but is compatible with the Active Endpoints tools.

The software is available for free download.

### 2.2 Active Endpoints: ActiveWebflow Servers <sup>4</sup>

The ActiveWebflow servers include a copy of ActiveWebflow Professional, the visual design and testing tool sold by Active Endpoints. (See 4.1)

#### 2.2.1 ActiveWebflow Standard v1.1

ActiveWebflow Standard is designed primarily for stand-alone deployment, for instance on a node PC. Its core engine technology is the ActiveBPEL engine, (see 2.1) and thus the BPEL 1.1 specification is fully implemented. BPEL is the server's native process language. As the code for the BPEL engine is Open Source, it is possible to create customised interfaces to the engine using its administrative APIs.

Prices for ActiveWebflow Standard start at \$5,995 or \$7,075 with one year's technical support.

#### 2.2.2 ActiveWebflow Enterprise v1.1

ActiveWebflow Enterprise is available for a range of J2EE containers. Its core engine technology is the ActiveBPEL engine, (see 2.1) and thus the BPEL 1.1 specification is fully implemented. BPEL is the server's native process language. As the code for the

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<sup>2</sup> <http://www.activebpel.org/index.html> (Validated: August 2005 - RG)

<sup>3</sup> Details of the GNU General Public Licence can be found at <http://www.gnu.org/licenses/gpl.html> (Validated: August 2005 - RG)

<sup>4</sup> <http://www.active-endpoints.com/products/index.html> (Validated: August 2005 - RG)

BPEL engine is Open Source, it is possible to create customised interfaces to the engine using its administrative APIs.

ActiveWebflow Enterprise servers are designed for high volume applications and offer "extensive run-time administration" via a web-based console.

Prices for ActiveWebflow Enterprise start at \$12,500 or \$14,750 with one year's technical support.

### 2.3 ActiveGrid: LAMP Application Server <sup>5</sup>

ActiveGrid's LAMP Application Server is currently Open Source software distributed under the Apache Software Licence 2.0. Their website talks of a commercial version of the software with enhanced features to be released later in 2005. The server supports "the latest XML standards including ... BPEL."

ActiveGrid's summary of the Application Server's requirements is:

"Platforms: Red Enterprise Server or Advanced Server v3.0 or higher; Novell SUSE Enterprise Server, Version 9.0 with SP1 or higher  
Hardware: Pentium 4/Xeon 800 Mhz or better; 1GB RAM; 10GB hard disk space"

There is an implication elsewhere on the site that the server will run with any standard LAMP stack (Linux, Apache, MySQL, PHP/Python/Perl).

The company website seems to assume that users will use the ActiveGrid Application Builder software as their authoring tool (see 4.2).

The website provides a certain amount of instruction for deployment of the server but this appears to assume considerable prior knowledge.

Support for the server package starts at \$1000 per year.

### 2.4 Apache Agila <sup>6</sup>

The Apache Incubator 'Agila' project has adopted the 'Twister' Web Service orchestration product (see 2.18) so that it will now consist of two parts: Agila BPEL and Agila BPM, the latter providing "end-user oriented workflow". Little information is currently available about the Agila Project.

### 2.5 bexee: BPEL Execution Engine <sup>7</sup>

bexee is a partial implementation of a BPEL engine. It was developed as a diploma project in the Berne University of Applied Sciences. The project has now finished, apparently in December 2004, and it appears that the current version 0.1 is the first and final release. The software is available from sourceforge.net but it is not clear under which open source licence it appears. The software runs in Tomcat and there is a reasonable level of documentation for the software in its current form.

The authors state that:

"It is possible to deploy and execute a BPEL process, but there are still a lot of restrictions:  
- No XML complex types

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<sup>5</sup> <http://www.activegrid.com> (Validated: August 2005 - RG)

<sup>6</sup> <http://incubator.apache.org/projects/agila> (Validated: August 2005 - RG)

<sup>7</sup> <http://bexee.sourceforge.net> (Validated: August 2005 - RG)

- No correlation data
- Limited number of activities implemented
- Only one port type per process
- No persistence"

Clearly this software is not appropriate for a serious deployment.

## 2.6 Cape Clear: Cape Clear 6 Enterprise Service Bus (ESB) <sup>8</sup>

This product includes five components:

- Studio: an Eclipse-based design and development tool
- Server
- Data Transformer: allows the server to handle non-XML and semi-structured data
- Orchestrator: provides BPEL orchestration capability
- Manager: management and monitoring of deployed services

Cape Clear 6 (now in version 6.1) provides "comprehensive support for BPEL 1.1" using native BPEL technology. A comprehensive range of support manuals and tutorials is provided via the company website. Support includes a user forum.

The product runs under Windows 2000 v5 SP1 or later, or XP, or under versions of UNIX. It integrates with many J2EE/CORBA/JMS servers. Orchestration Studio, the Eclipse-based visual development and testing tool, which is included, requires Windows or LINUX.

The website, which is in other respects comprehensive, does not quote prices for the product or support.

## 2.7 Collaxa: BPEL Orchestration Server

Collaxa was bought by Oracle in the summer of 2004 and their BPEL server became the Oracle BPEL Process Manager (2.14). See, for instance, <http://www.rittman.net/archives/000969.html>

## 2.8 Creative Science Systems: BizZyme BPEL Java Server <sup>9</sup>

Creative Science BizZyme™ is part of the company's NetZyme Suite but can be used without the other family members. It is compatible with Windows XP/2000/NT/98, Linux RedHat and SuSE, Solaris, Solaris (x86), FreeBSD, Mac OS X and SGI (in fact "any platform that runs Java SDK ... 1.4 or higher"). It supports any database with a JDBC driver. The company claim "full implementation of the latest version of BPEL4WS." The product uses a one-pass BPEL compiler and comes with a "UML-style graphical design tool".

Considerable documentation for the product, including an Administrator Guide and a User Guide, is available for download from the website but there does not seem to be an evaluation download and there is no pricing information.

## 2.8 FiveSight Technologies: PXE Process eXecution Engine <sup>10</sup>

The FiveSight PXE is an open source product licensed partly under the Common Public Licence and partly under the MIT Licence. The Sourceforge.net pages describe the development status as "4 - beta" but the downloadable files indicate 1.0. The intended audience is software

<sup>8</sup> <http://www.capeclear.com> (Validated: August 2005 - RG)

<sup>9</sup> <http://www.creativescience.com/products-bpel.html> (Validated: August 2005 - RG)

<sup>10</sup> <http://www.fivesight.com/pxe.shtml> (Validated: August 2005 - RG)

developers and architects. The current version is intended only for experimentation or single-server production use; larger deployment options are under development.

PXE is written in Java to run in a "minimal environment", a J2EE application server or other middleware stack. The publicity claims that it can "run both BPEL4WS 1.1 and WS-BPEL 2.0 processes on a single ... runtime." However the FAQs page admits that they are working to a BPEL 2.0 recent draft and "because the standard is still evolving, all language features are not yet supported. FiveSight plans to provide full support for the OASIS WS-BPEL specification concurrent with its approval as a standard. Currently all BPEL activities are supported. However, certain language constructs (principally BPEL event handlers) are not supported, and certain other constructs may not be fully supported."

PXE does not have a visual development tool associated, indeed its management is by command line. It should, however, accept "well-formed" BPEL from any source.

The product/project has its own wiki covering a wide range of topics and support.<sup>11</sup>

PXE runs on any operating system supporting the required Java environment; it has been successfully tested on Windows 2000 and XP, Linux, MAC OS X, Solaris and AIX. "Although PXE depends on common J2EE interfaces, it does not require a J2EE application server. PXE relies on a Binding API that allows PXE to be embedded in most (sic) any environment that can supply JTA facilities... PXE can be deployed into most common application servers [but] PXE is not an *enterprise application* in the J2EE sense: PXE manages its own transactions and threads. Consequently, if PXE is deployed using a WAR or EAR file, it will be in violation of a number of J2EE contracts."

PXE is available for free download.

## 2.10 IBM alphaWorks BPWS4J<sup>12</sup>

This product may best be described by quoting in full IBM's own announcement posted on their alphaWorks site in August 2002.

"The IBM Business Process Execution Language for Web Services Java™ Run Time (BPWS4J) includes the following: a platform upon which can be executed business processes written using the Business Process Execution Language for Web Services (BPEL4WS); a set of samples demonstrating the use of BPEL4WS; a tool that validates BPEL4WS documents; and an Eclipse-based editor for BPEL4WS processes. BPWS4J was released on the day that the BPEL4WS specification was made public, and for a while after was the only realization of the specification available to those who wanted to experiment with the language. BPWS4J is currently being used as the representative IBM implementation in the Implementation and Interoperability subgroup of the OASIS Technical Committee that is standardizing BPEL4WS."

Since then, IBM have provided production-level support with their Websphere Business Integration Server Foundation (see 2.11)

The alphaWorks website provides minimal instructions for downloading and installing the software. There is also a fairly active user forum there. We have not listed the editor in section 4 because the 90-day software licence described below presumably applies and because a reference to it in the associated FAQs sections states baldly "there will be bugs".

The standard alphaWorks trial licence is for 90 days of testing and development. Deployment, or use after the 90 days requires the purchase of a licence from IBM. This product is not on the current licences list but such a licence could be requested. Licences for other products in the list range from a few hundred to a few thousand dollars each.

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<sup>11</sup> <http://pxe.fivesight.com/wiki/display/PXE/Home> (Validated: August 2005 - RG)

<sup>12</sup> <http://www.alphaWorks.ibm.com/tech/bpws4j> (Validated: August 2005 - RG)



## 2.11 IBM Websphere Business Integration Server Foundation <sup>13</sup>

IBM's WebSphere® Business Integration Server Foundation v5.1 includes native support for "BPEL4WS". The server runs on a wide variety of platforms including versions of AIX, HP-UX, Linux, Solaris and Windows.

The area of IBM's website devoted to the server provides access to extensive documentation and support, including a number of user forums and newsgroups.

Use of BPEL on the server envisages use of IBM's WebSphere Studio Application Developer Integration Edition v5.1, their tool for "building, testing, integrating and deploying J2EE applications, Web services and business processes." See 4.3

Prices for the server start at approximately \$49,000 including one year's software maintenance.

## 2.12 OpenLink: Virtuoso Universal Server <sup>14</sup>

Openlink's Virtuoso 3.5 is described on their webpages as a "next-generation Universal Server Platform" implementing a "plethora of industry standards". Amongst these is "BPEL4WS".

Given the range of standards implemented on the server it is perhaps not surprising that BPEL gets little coverage other than in the documentation covering the Openlink implementation of the language. It might be assumed that BPEL 1.1 has been implemented in full but nowhere was this found "in print". Similarly, given that the product is a universal server, it is perhaps not surprising that there seemed to be no reference to components for the development and testing of software.

The deceptively simple website gives access to extensive documentation (including the 2,068 page manual), demonstrations, tutorials and "how-to guides" as well as to a range of support features.

The server will run on a range of platforms: Windows, Linux, Unix and Mac OS X and has a flexible licensing system based on unlimited database connections, starting at \$4,999, or on unlimited clients connecting to a restricted number of concurrent database connections, starting at \$599. The software is available for a 30 day free evaluation. These prices do not include support which is charged at an additional 15% per year.

## 2.13 OpenStorm Software: Service Orchestrator

Although OpenStorm Software Inc was being listed in the press as a supplier of BPEL related products as late as June 2005, their website(s) had disappeared by mid-August.

## 2.14 Oracle: BPEL Process Manager <sup>15</sup>

The Oracle BPEL Process Manager is a development of the Collaxa BPEL Orchestration server. At the time of writing the version number has jumped from 2.0 to 10.1.2, presumably to bring it into line with the company's Application Server 10g.

The Process Manager provides "native and comprehensive BPEL support" on Oracle Application Server, WebLogic, and JBOSS. The website states that WebSphere is also supported but there did not seem to be a specific download for it as at 15 August 2005. Equally, the FAQ page

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<sup>13</sup> <http://www.ibm.com/software/integration/wbisf> (Validated: August 2005 - RG)

<sup>14</sup> <http://virtuoso.openlinksw.com/index.htm> (Validated: August 2005 - RG)

<sup>15</sup> [http://www.oracle.com/appserver/bpel\\_home.html](http://www.oracle.com/appserver/bpel_home.html) (Validated: August 2005 - RG)

indicates that the product will run on any J2EE server, but this was not obviously reflected on the downloads page.

The website provides technical information and access to support.

Oracle provide a visual BPEL Designer which works with Eclipse 3.0 and/or Oracle's JDeveloper development environment. Whilst the Oracle website makes much of the fact that Designer's output is 100% portable there is no indication that the product can be bought separate from Process Manager; their store does not list a Designer package.

The price of a perpetual 'processor' licence is \$40,000. Time-limited or user limited licences are also available for considerably less.

### **2.15 Parasoft: BPEL Maestro <sup>16</sup>**

Parasoft's BPEL Maestro provides "native support for [the] BPEL standard". Versions are provided for Windows 2000/XP, Linux and Solaris to run in a J2EE servlet container.

The company website provides information about the product, a user forum and technical support. The software is available for evaluation but no price is provided for the product itself.

BPEL Maestro includes an Eclipse-based toolkit for developing, reviewing, updating, managing, deploying and debugging BPEL processes.

### **2.16 PolarLake: Integration Suite <sup>17</sup>**

The PolarLake Integration Suite "fully implements the BPEL standard." It is written in Java and can be deployed in any J2EE application server or as a standalone server. The complete suite comprises the PolarLake JIntegrator, Messaging Integrator, Database Integrator, Process Integrator and the PolarLake Adapters. Inbuilt is a design tool specific to the PolarLake approach.

The PolarLake general website provides a range of general technical documents but no detailed support documents or contacts.

An evaluation copy of the software is available on request and pricing information must be requested from the company.

### **2.17 SeeBeyond: eInsight Enterprise Service Bus 5 <sup>18</sup>**

The eInsight Business Process Manager is part of SeeBeyond's ICAN Suite 5 (Integrated Composite Application Network). Enterprise Service Bus 5 is "a limited edition version ... natively utilizing BPEL4WS and UDDI to coordinate enterprise Web services." It can be "sold standalone and supports all SeeBeyond eWay Intelligent Adapters which can be purchased separately..." The website did not seem to provide any further useful information; all avenues of enquiry seemed quickly to arrive at "contact us".

### **2.18 Twister: Twister**

The Apache Incubator 'Agila' project has adopted the 'Twister' Web Service orchestration product so that it will now consist of two parts: Agila BPEL and Agila BPM, the latter providing "end-user oriented workflow". Little information is currently available about the Agila Project.

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<sup>16</sup> <http://www.parasoft.com/jsp/products/home.jsp?product=BPEL&itemId=114> (Validated: August 2005 - RG)

<sup>17</sup> <http://www.polarlake.com/en/html/products/integration/index.shtml> (Validated: August 2005 - RG)

<sup>18</sup> <http://seebeyond.com/software/einsight.asp> (Validated: August 2005 - RG)

The original Twister website is still available and Twister v0.3 is still available from Sourceforge.net although nothing seems to have been added to the site or associated Blog since the announcement of the Apache adoption on 11 April 2005.

Twister is an open source product licensed under LGPL and written to the "WS-BPEL standard". It is written in Java. The software runs inside a Tomcat servlet container. The website provides extensive documentation and detailed installation instructions. However, "to be able to create new processes using Twister you will need a fairly good knowledge of WS-BPEL." The Twister website invites users needing trainings (sic) to contact Smartcomps.org, the original developers. It is not clear whether this service is still on offer. Sourceforge.net has an active Twister users' forum but the last message on it (as at 10 August 2005) is from Matthieu Riou - responsible for the Twister website - exhorting users to switch to the users' forum on the Apache Agila site.

The software is available for free download.

### **2.19 Vergil Technology: VCAB Server <sup>19</sup>**

Although Vergil Technology was being listed in the press as a supplier of BPEL related products as late as June 2005, their website(s) had disappeared by mid-August.

### **2.20 Verity LiquidBPM**

Verity LiquidBPM "is a comprehensive business process management and workflow automation solution" comprising the LiquidBPM engine, LiquidBPM Studio, LiquidBPM Manager and the LiquidBPM BPEL Orchestrator. This last includes a visual design environment, a BPEL runtime engine, and a monitoring and management tool.

The Verity website states that "... BPEL Orchestrator is available as an add-on to Verity LiquidBPM." The suite of software is available for 30 day evaluation but no price is given.

LiquidBPM was formerly Dralasoftware Workflow.

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<sup>19</sup> <http://www.vergiltech.com>

### **3 BPEL runtime environments for .NET**

#### **3.1 Microsoft: BizTalk Server 2004 <sup>20</sup>**

To quote: "Microsoft ® BizTalk ® Server 2004 is an integration server product that enables [the user] to develop, deploy, and manage integrated business processes and XML-based Web services." The server can import and export BPEL processes.

The website gives access to extensive documentation, demonstrations and tutorials. A wide range of support facilities is available including a "community" page providing access to newsgroups, webcasts and weblogs from both within and without Microsoft.

BizTalk Server requires Windows Server 2003 and SQL server. Depending on the licensing model adopted (related to scalability) the BizTalk licence itself can cost as little as \$999 per processor.

#### **3.2 OpenStorm Software: ChoreoServer**

Although OpenStorm Software Inc was being listed in the press as a supplier of BPEL related products as late as June 2005, their website(s) had disappeared by mid-August.

#### **3.3 OpenStorm Software: Service Orchestrator**

Although OpenStorm Software Inc was being listed in the press as a supplier of BPEL related products as late as June 2005, their website(s) had disappeared by mid-August.

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<sup>20</sup> <http://www.microsoft.com/biztalk/> (Validated: August 2005 - RG)

## 4 BPEL visual authoring tools

### 4.1 Active Endpoints ActiveWebflow™ Professional <sup>21</sup>

ActiveWebflow Professional is an Eclipse-based visual design and testing environment for BPEL processes. It was designed specifically as a BPEL tool and is not an adaptation of another product.

According to the Active Endpoints website, much of the BPEL design work can be carried out using drag and drop of BPEL constructs, and portions of the diagrams thus created can be stored away for re-use in other projects. BPEL process definitions can be imported from other authoring tools. Extensive simulation and debugging tools are provided using an embedded ActiveBPEL engine.

The website does not appear to indicate the version of Eclipse that is required. Prices start at \$995 or \$1,175 including one year's technical support. The product is included with ActiveWebflow servers.

### 4.2 ActiveGrid Application Builder <sup>22</sup>

The ActiveGrid Application Builder is a general purpose Web 2.0 visual development tool which includes BPEL in the range of standards that it will deal with using wizards and graphical editors. The package includes a built-in web server, database, sample applications and tutorial.

The software is open source, released under the Apache Software Licence 2.0. It requires a Pentium 4 based machine or a PowerPC G4/G5 with at least 512Mb RAM and 10Gb disk space, Windows XP SP1 or better, or Mac OS X 10.1 or better, or Red Hat Desktop v3.0 or better, or Novell Linux Desktop v10.1 or better.

Support for the software package can be bought starting at \$300 per year.

### 4.3 Bind Systems: BindStudio 1.1 <sup>23</sup>

This "BPEL Tool" was listed in a review of BPEL-related products in March 2005. The website was not available in August 2005.

### 4.4 IBM WebSphere Studio Application Developer Integration Edition v5.1 <sup>24</sup>

IBM's Websphere Studio Application Developer Integration Edition is intended for use with the company's Websphere Business Integration Server. It provides extensive support for designing, testing and deploying BPEL4WS via an Eclipse-based user interface.

The website provides extensive documentation and support.

The product costs \$7,279 including one year of software maintenance.

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<sup>21</sup> <http://www.active-endpoints.com/products/index.html> (Validated: August 2005 - RG)

<sup>22</sup> [http://www.activegrid.com/application\\_wht.php](http://www.activegrid.com/application_wht.php)

<sup>23</sup> <http://www.bindsys.com/bindstudio2/documentation.htm>

<sup>24</sup> <http://www-306.ibm.com/software/integration/wsadie/> (Validated: August 2005 - RG)

#### 4.5 Mega Designer <sup>25</sup>

Mega Designer is a visual modelling environment for system design using UML based modelling languages. Amongst its features is the ability to produce BPEL code.

The software requires Windows 2000 (SP3+) or XP (SP1+) together with Microsoft Word 2000, 2003 or XP; Internet Explorer v5.5+

No price is given on the website.

#### 4.6 VisualScript XML <sup>26</sup>

VisualScript XML is promoted as a tool to generate XML in an intuitive and logical way using symbols and diagrams. It can be customised for any flavour of XML (XSL, BPEL, BPSS, and more). The site makes no reference to UML.

The website provides a wide range of support including manuals, tutorials, examples, knowledge base, a user forum, and a library of models to share (these last two still appear to be at an early stage in their life cycle).

The product costs \$495 and is available for a 30 day free trial. It runs on Pentium PCs running versions of Windows from 95 up

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<sup>25</sup> [http://www.mega.com/en/product/mega\\_designer/index.asp?l=en](http://www.mega.com/en/product/mega_designer/index.asp?l=en) (Validated: August 2005 - RG)

<sup>26</sup> <http://www.visualscript.com/products/visualscript/index.htm> (Validated: August 2005 - RG)

## 5 Educational Programmes

### 5.1 Active Endpoints <sup>27</sup>

During the production of this document, Active Endpoints Inc announced a new Academic Programme. This provides a system whereby qualifying higher education and research institutions can obtain an annual licence for ActiveWebflow Professional (the BPEL design tool) and ActiveWebflow Standard (the non-enterprise server) to be used in teaching and research. The products may not be used "to run the infrastructure of [a] department."

The cost of membership for one year is given as \$500 (US) per institution which includes technical support via the online forums. The website provides considerable detail about the flexibility of the licence and the eligibility criteria.

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<sup>27</sup> <http://www.active-endpoints.com/academic> (Validated: August 2005 - RG)

## 6 RepoMMan evaluation criteria and results

The RepoMMan project is one strand of the work towards developing a repository at the University of Hull. The evaluation criteria set out below necessarily reflect aspects of the University's existing IT strategies and structures.

The BPEL engine that we adopt should ideally:

- be Open Source software (with an acceptable licensing agreement)
- adhere to existing standards (BPEL 1.1)
- run BPEL as a native process
- be J2EE compliant
- run on one of the University's preferred platforms
- be straightforward to deploy
- allow easy development of BPEL-based tools
- be compatible with one or more visual authoring tools
- have a reasonable level of technical support available
- be inexpensive

In addition we wish to adopt a flexible, low cost, visual editor for the production of BPEL code. This may be integrated with a BPEL engine product or stand-alone.

On the basis of these investigations it is our intention to use the Active BPEL LLC ActiveBPEL engine together with the ActiveWebflow Professional designer. This software may be obtained directly or, if Active Endpoints agree to our participation, through their Academic Programme.



## **Appendix A Summary sheet**

The summary sheets of the evaluation information were developed as Excel spreadsheets. These will not easily reduce to a legible table and so are provided "as-is" in a separate file which can be downloaded from the documents store in:

[www.hull.ac.uk/esig/repomman](http://www.hull.ac.uk/esig/repomman)

