



Expert Systems - Bringing Expertise to Those that Need It Now Running Server Side

In addition to the standard Corvid Applet Runtime program which runs client-side, Corvid Servlet Runtime provides an optional, alternative way to deliver Exsys Corvid knowledge automation expert systems to end users. The Exsys Corvid Servlet Runtime uses Java Servlet technology allowing the proven Corvid Inference Engine to be run on a server with only HTML pages sent to the client machine running the system.

The full range of HTML (including CSS, JavaScript, AJAX, etc) options are made available for the end user interface, providing the opportunity for many advanced design options and integration into web sites.

All system processing is done on the server so there is no client-side Java support required, allowing systems to run on iPads and other mobile devices. Since all system files reside only on the server, system security is enhanced, and integration with other server-side programs is simplified.

The Exsys Corvid Servlet Runtime can also be used to integrate Corvid systems with an Adobe® Flash® user interface for the most complex RIA applications.

Benefits:

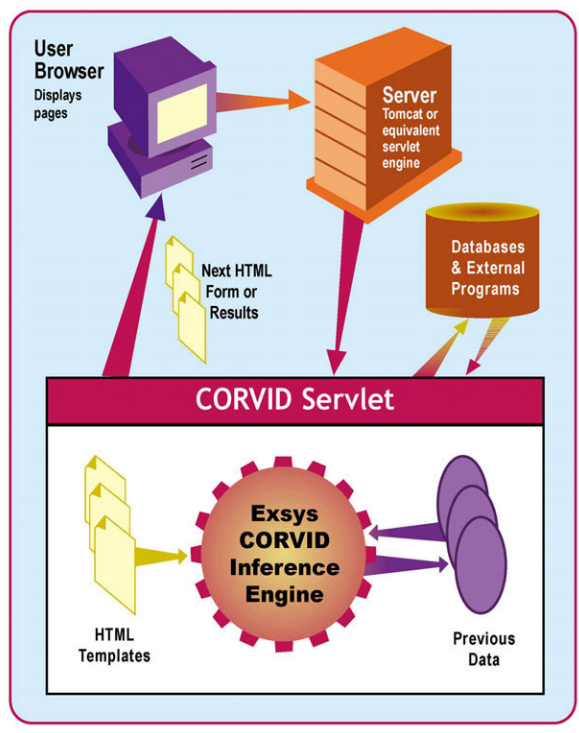
- Based on powerful, scalable Java Servlet technology for large numbers of simultaneous users
- Server-side processing (thin client)
- HTML templates easily implement a consistent look-and-feel

- Dynamically generated interface based on end user input and system logic
- Fully interactive online sessions
- Replaceable parameters and conditional inclusion of blocks of HTML
- XML interface to Flash SWF files
- Easy to integrate with other server-side programs
- Directly generate reports in HTML, RTF or PDF formats
- Automate email generation
- Compatible with Corvid systems created for the Exsys Corvid Applet Runtime
- Build and test in the Corvid Development Environment

Corvid Online Delivery Options

Systems built with Exsys Corvid can be fielded online in two ways - the Corvid Applet Runtime (included with Exsys Corvid) and the optional Corvid Servlet Runtime. Both use Java for portability and compatibility, but one uses Java Applets running on the end user's computer and the other uses Java Servlets running on a server sending HTML pages to the end user's browser. Both approaches incorporate the same Corvid Inference Engine and systems built with Corvid can be fielded using either delivery option.

The Corvid Applet Runtime works very well and is all that is needed to field most systems online. However, the Corvid Servlet Runtime, provides many more end user interface design options including HTML and Adobe Flash. Far more complex user interfaces can be created and systems can be better integrated into advanced web sites.



Since the end user is only sent HTML forms, they can have a thin-client with just a standard browser. Systems will work on all browsers and all operating systems, with very minimal client-side requirements. There are no potential issues of the end user's PC either blocking or not supporting Java Applets. Corvid Servlet based systems will run on iPhones and iPads which lack Applet support. The Corvid Servlet Runtime also provides greater system security, tighter integration with other server resources such as databases and some additional functionality such as automated email.

Capability	Applet Runtime	Servlet Runtime
End User Interface Design		
Screen design language	Corvid Screen Commands	HTML
Degree of control	Control limited to color, position, fonts, images	Full control of entire screen - anything that can be done in HTML
Support for CSS, javaScript, Spry, Ajax, HTML5	None	Full
Support for Adobe Flash	None	Full

Capability	Applet Runtime	Servlet Runtime
Support for Tables	Very limited	Full
Implement standard site look-and-feel	Set style properties that apply to all questions	HTML templates with replaceable parameters
System user interface	Applet window in HTML page	Full HTML page
Ease of development	Similar to formatting a Word processor document	Sample templates provided that can be edited with an HTML editor
Complexity of design	Limited - though enough for many systems	High - anything that can be done on an HTML page
Security		
Where system is run	End user machine	Server
System CVR (runtime) file sent to end user machine	Yes	No
Other system files	Must be available on server via a URL	Access to files can be blocked
Security		
Database interface	Requires server program and file to limit commands that can be run	Internal - no potential external ability to run commands
Browser		
End user requirements	Must allow / support Java Applets	Any browser (Some browsers may not support advanced capabilities such as HTML5 or CSS3) Adobe Flash based systems require browsers that support Flash
Email		
Automated support	None	Yes
Commercial Systems		
Suitability	Somewhat limited	High - Also ideal for subscription based systems

Servlets

Servlets are Java programs that run on the server. Servlets are run using a servlet engine such as Tomcat, Glassfish, IBM Websphere or others. The servlet is called with a simple URL, just like a Web page, and passed data. The servlet processes the information and sends back an HTML page to the user. In the case of the Exsys Corvid Servlet Runtime delivering a system, there typically will be a dynamic succession of screens asking questions and displaying results. Each screen adds information and continues the session.

There can be many users simultaneously running sessions. The Oracle/Sun/Java Servlet technology is well developed and highly efficient. The Corvid Servlet Runtime will automatically and invisibly keep track of each user and their data.

The Corvid Servlet Runtime program needs to be installed on a server that supports Java servlets. This can be done using Tomcat or Glassfish (free from Oracle/Sun), Websphere from IBM or other standard "Servlet Containers". Since the servlet is in Java, it does not matter if the server is UNIX, LINUX, MS Windows or OSX.

User Interface

One of the biggest advantages of using the Corvid Servlet Runtime rather than the Corvid Applet Runtime is in the user interface options. The Servlet approach allows far more complex user interfaces and supports many screen designs that are not possible with the Applet Runtime.

BusinessLaw.gov
Legal and Regulatory Information for America's Small Businesses SBA

Please answer the following questions regarding the position of employment:

	YES	NO
Will the alien employee be transferred to the U.S. from the sponsoring employer's related entity abroad?	<input type="radio"/>	<input type="radio"/>
Will the alien employee fill a nursing position in the U.S.?	<input type="radio"/>	<input type="radio"/>
Does the position require artistic or athletic performance?	<input type="radio"/>	<input type="radio"/>
Does the position require the services of a religious professional?	<input type="radio"/>	<input type="radio"/>
Will the alien employee's services be cultural in nature?	<input type="radio"/>	<input type="radio"/>
Does the sponsoring employer operate a vessel or airplane entering the U.S. temporarily for which the services of an alien employee are needed as a crewmember?	<input type="radio"/>	<input type="radio"/>
Is the intended employment agricultural in nature?	<input type="radio"/>	<input type="radio"/>
Is the primary purpose of the employment for the alien employee to be trained in the U.S.?	<input type="radio"/>	<input type="radio"/>
Is the alien employee regarded as outstanding in his or her field?	<input type="radio"/>	<input type="radio"/>
Is the alien employee a citizen of Canada?	<input type="radio"/>	<input type="radio"/>
Is the alien employee a citizen of Mexico?	<input type="radio"/>	<input type="radio"/>
Is the alien employee a citizen of Ireland?	<input type="radio"/>	<input type="radio"/>

Next Previous Question Restart

Created with Exsys CORVID

The Corvid Applet Runtime interface screens are designed by setting the color, font and position of text, controls and images. This is somewhat similar to formatting a word processing document. The Corvid Applet Runtime processes these Screen Commands to produce the layout in the applet window. It is easy to do and works well for many system, but it is limited compared to HTML design, especially when CSS, JavaScript and Flash are included.

With the Corvid Servlet Runtime, the screens that the end user sees in their browser are standard HTML pages and forms, and can use anything that the browser supports, including HTML, CSS, JavaScript, Spry, Ajax, etc. There is no Java Applet or client-side Java support required when using the Servlet Runtime.

Match Food

Do you add a seasoning or other ingredients to your meal?

- Mustards and vinegar
- Spices
- Spirits, wine and water
- Sugar and cocoa
- Delicatessen
- Pasta and rice
- Salt and pepper
- Creams, butter and milk foods
- Oils, fats and lards
- Jams and syrups
- Fruits
- Breads, cereals and flour
- Herbs and plants
- Sauces, funds and roux
- Eggs fish or poultry
- Vegetables and mushrooms
- Cheeses
- Nothing to be added

OK

The screens are dynamically generated by the Servlet Runtime based on the logic of the system, and underlying Corvid Inference Engine. The system determines if it needs some item of information, in which case it will ask the user a question, or display some results or recommendations. The design for a particular page is generally created by a HTML "Template" file that the Corvid Servlet Runtime processes.

Templates

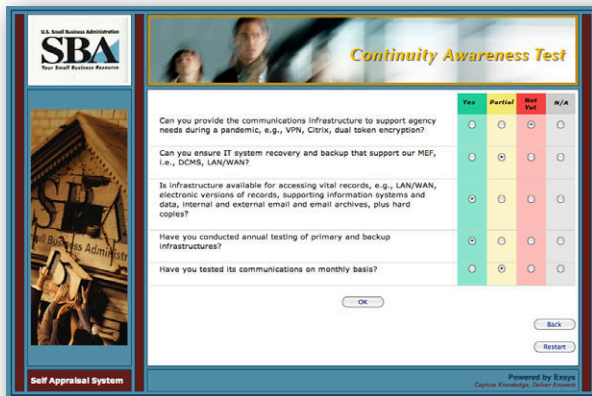
The Corvid Servlet Runtime templates are a combination of standard HTML and some special Corvid commands that are included as HTML comments. The template makes it easy to apply a look-and-feel to all the pages generated by a system with only one or 2 template files. A template can apply to all, or some, of the questions in a system.



When needed additional templates can be used to change the look of specific questions. A report template does the same thing for the system results.

Since the templates are mostly just HTML, and the Corvid commands are HTML comments, they can easily be created and edited in standard HTML editors. While Corvid parses the special Corvid commands, the rest of the page is just passed through and can contain any HTML code that is needed.

Templates can include Corvid commands that are dynamically replaced by the various items of text associated with a variable. This allows the template to dynamically change to build pages for the many different variables that can be asked in a system. Since the Static List variables in a system often have different numbers of values, the templates can have replaceable parameters that repeat for each value.



For example, a template to ask questions could contain:

```
<!-- CORVID_ASK STATIC_LIST -->
  VARIABLE_PROMPT <BR>
  <!-- CORVID_REPEAT -->
    <input type="checkbox"
      value="VARIABLE_VALUE_SHORT"
      name=" [ VARIABLE_NAME ] ">
    VARIABLE_VALUE_TEXT
  <BR>
  <!-- REPEAT_END -->
<!-- ASK_END -->
```

The "CORVID_ASK STATIC_LIST" command tells Corvid that the code down to the "ASK_END" should be used when the variable being asked is a Static List (a multiple choice question with several possible values). A template can also contain similar sections for other types of variables or specific variables so a single template can be used for all the question screens in a system.

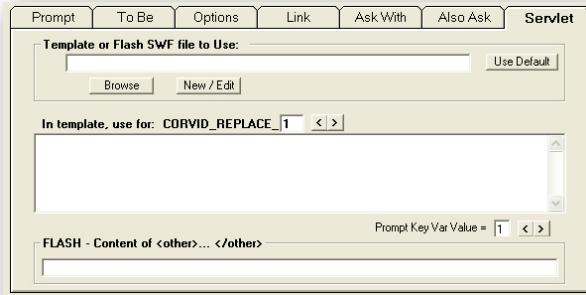
The "VARIABLE_PROMPT" will be replaced by the prompt text for the specific variable being asked. The "CORVID_REPEAT" will use the code down to the "REPEAT_END" to add a checkbox for each value in the Static List variable's value list. Each will be a control with the "name" set to the variable and the value set to the text of the value. This simple block of code can be incorporated in a complex HTML page, be styled with CSS, etc. for a template that asks all of the questions in a system. When the "Also Ask" options are set for a variable, the template will automatically add in the other variables to be asked on the same screen using the appropriate section of the template.

Reports can be built in a similar way using special commands associated with the variables and double square bracket embedded variables.

The replaceable Corvid parameters in the template allow the system wording and logic to be modified independently from the template. The templates defines how the questions will look, but the actual wording and grouping of the questions is controlled from the development tool in Exsys Corvid.

If you wish to change the wording of a question, ask additional questions, or even ask them in a different language, the changes can be made directly in the Corvid

development tool without having to modify the templates. Corvid developers and web designers can work on the same project in parallel. The actual text on the page can be changed by editing the Corvid system without changing the template, and templates can be created by web designers without their having to know the exact details of the system wording or using the Corvid Development tools.



Each variable in a system has an associated template or Flash SWF file, along with sections of text or HTML code unique to the variable, making it easy to use a single template even when each variable may have slightly different user interface requirements.

Templates make it easy to build systems that fit into existing web sites. If the site look changes, usually all that is required is to change the template to match, without having to modify the Corvid system.

The Corvid Servlet Runtime includes a set of prebuilt "generic" templates that can run most systems and which can be easily edited in any HTML editor.

Reports

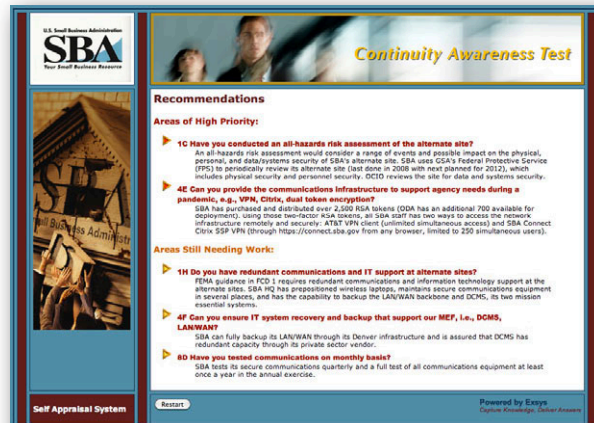
Exsys Corvid systems display advice and recommendations, which are displayed as dynamically built HTML pages on the user's browser. These can also be built using templates to control the design, while including actual content using double square bracket embedding of Corvid variables. The content may be simple text, or may be built dynamically in the Corvid system to include other HTML commands, CSS styling, etc, to be embedded in the overall page. Unlike the Corvid Applet Runtime which must call a server program to build reports, the Corvid Servlet Runtime can immediately build and display a report. Even RTF and PDF reports can be easily created and displayed.

Actions

Since questions (and many reports) are asked as an HTML form, it must have an "Action" to get the data back to the server with the correct identification information to associate it with a particular session. Corvid handles this automatically. Just add the line:

```
<form method="post"
action="CORVID_SERVLET">
```

and Corvid will replace the "CORVID_SERVLET" with the server location and session identification automatically. Systems can even be moved between server locations without having to change the templates.



Automatic Email

The Servlet Runtime can automatically build and send emails based on the system logic. This functionality is not supported in the Corvid Applet Runtime.

This can be used to:

- Email reports and advice to users
- Notify appropriate personnel of special situations that monitoring systems detect
- Notify system developers when certain rules fire
- Dynamically build customized Web "brochures" for each individual that are emailed to them
- Automate complex email tasks using Corvid logic

Adobe Flash

Rich Interactive Applications (RIAs) with Smarts

Adobe® Flash® has changed the way Web sites look, and now those sites can be greatly enhanced to deliver the situation-specific advice and recommendations your Web site visitors need.

Corvid lets you create Web-enabled Knowledge Automation systems that use Flash for the end user interface. The powerful analytical power of Exsys Corvid can be combined with many graphic, animation and video capabilities to produce systems that are not just beautiful, but beautiful and smart.

Adobe Flash is widely used to provide the sophisticated graphics, animation and complex user interaction that have become the standard in commercial Web sites. However, trying to implement complex analysis or expert decision-making logic in Flash's underlying programming language, Action Script, is both very difficult to write and requires hard coding the logic into the system – a maintenance nightmare.

Exsys Corvid easily describes the logic of complex decision-making tasks. Now the Exsys Corvid Servlet Runtime can be directly integrated with Flash applications putting the full analytical power of Corvid into the RIA interfaces Flash provides.

Activities Not Interested → Very Important

CARIBBEAN ISLAND SELECTOR

Where should I go
Show Top: 0

Your Priorities

PROS:
An island with great birding. A really great place for scuba. Many very fine restaurants.

CONS:
None

Boracite
"Divers Paradise"

83 official dive sites with 100-150' visibility! The whole island is a protected Marine Park, keeping it untouched and unspoiled. Plenty of off-shore 24/7 variety and short boat trips for divers and snorkelers. The island has 150 species of birds including flamingos, and the protected Lora, with good birding at Washington/Sigaboa National Park. Along with conch-fishing, anglers can go after sailfish, marlin, tuna and tarpon, and the island hosts a number of local and international fishing tournaments. Boracite's 50 plus restaurants have taken high honors at international culinary competitions two years in a row. Lac Bay is popular with wind surfers with a 90% chance of favorable winds.

Flash system using sliders, pull-downs, mouse overs and dynamically built system results

Integrating the Corvid Servlet Runtime with Flash is quite simple. The Flash SWF can use any design and controls supported by Flash. It can get user input and send it to the Corvid Servlet Runtime on the server using "post". The Corvid Inference Engine will use the data, along with system logic to determine the next step to take. That may be asking a question, or it may be a result / recommendation. The Corvid Servlet Runtime sends back XML data to the Flash SWF file. The Flash program can parse the XML to determine what to do and present text, reconfigure the screen, or even load a new SWF file accordingly. This process can be repeated as many times as needed.

A Flash based system may have a single screen with multiple controls, or may ask questions one at a time. The typical Flash Actions Script code that needs to be added to a Flash program is provided with the Corvid Servlet Runtime.

Security

The Corvid Servlet Runtime provides higher security for your systems in many ways. All the files are kept on the server. All that is sent to the end user are HTML pages. No runtime files are sent to the client PC for processing. Integration with databases and other server programs happens internally and invisible to the end user. When using the Corvid Applet Runtime, database and report functions require making calls back to the server which must be designed to prevent any unauthorized use. This can be done, but with the Corvid Servlet Runtime it is all internal and no external access needs to be permitted.

Also, your end users will never be asked if they will "Allow an Applet to Run". While the Corvid Applet Runtime is completely safe, some browsers insist that users accept all Java applets individually. With the Corvid Servlet Runtime, the HTML you send your users is no different from that on any other web page and they will not be asked to "accept" it.

Future Technologies

Web technologies and standards are constantly changing with enhancements such as HTML5 and CSS3 and new devices like the iPhone and iPad with their special capabilities and requirements. The Corvid Servlet Runtime processes it's special replaceable parameters to dynamically set the text for each variable, but the rest of the code in the template is just passed through unchanged. If you want to take advantage of new technologies, special browser plug-ins or anything else you can include in a page, the Corvid Servlet Runtime will let you do it. As the web changes, your Corvid systems can grow with it.

Commercial Systems

There are many reasons to build and field Corvid expert systems and many different audiences for a system. Commercial systems are some of the most demanding, though also some of the most beneficial. Commercial systems often have complex user interface requirements that can only be met with the Corvid Servlet Runtime. The ability to do anything that can be done in HTML or Adobe Flash allows a Corvid system to fit in with any design requirements.

Exsys Corvid / Flash Examples

W.I.N.K. (What I Need to Know)

A web-site concierge. Exsys has been used for an incredibly wide range of problem types, across many industries. This system asks a potential customer a few questions about their interests and builds a custom HTML



page of information tailored to their needs, including case studies probabilistically selected to match their identity and interest area. Flash is used to drive an animated user interface that asks the questions.

<http://www.exsyssoftware.com/FlashDemos/Wink>

Caribbean Vacation Advisor – This system asks the end user what activities are most important to them on their vacation, and uses

the Corvid Inference Engine to probabilistically select the best Caribbean islands for them to visit. Each island is described with the Pro and Cons based on



their particular interests. This system extensively uses Flash's ability to make controls interactive, presenting an attractive, easy-to-use interface for a complex advisory system that can still run in a single window.

<http://www.exsyssoftware.com/FlashDemos/Caribbean/IslandSelector.html>

Contact Exsys today for more great information on the Exsys Corvid Servlet Runtime, other software products and packages and consulting services.



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