

YUMETECH, INC.: XMSF WORKSHOP WHITEPAPER

The Interoperable Media Player Toolkit (IMP)

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Currently, severe interoperability problems exist in the current generation of defense-related modeling and simulation systems. Active legacy applications have limited integration, uneven levels of support and unreliable interoperability. In this whitepaper, Yumetech, Inc.—located in Seattle, Washington—proposes a suite of tools designed to rectify the above problem: the Interoperable Media Player Toolkit (IMP).

IMP is a framework for creating XML-based applications that require integrated 2D and 3D media. These products can be designed for a variety of platforms ranging from handheld devices to personal computers to immersive devices such as CAVEs or domes. IMP is comprised of a series of media players integrated by a compositor that integrates their outputs into a single view. Its design allows for the adoption of new media standards as they appear, and to take advantage of changes in rendering technology.

How IMP Works

IMP will allow developers to create real-time applications that permit multiple namespace documents to be rendered in the same view space. Developers can integrate any XML-encoded media format as long as it has an accepted stylesheet and renderer. Moreover, the toolkit's architecture will adopt a modular structure that allows various media types to be added or replaced. In this way, IMP implementations will be able to adapt to new technologies as they become available without requiring extensive rewriting of their software. Figure 1 shows the basic structure of an IMP application.

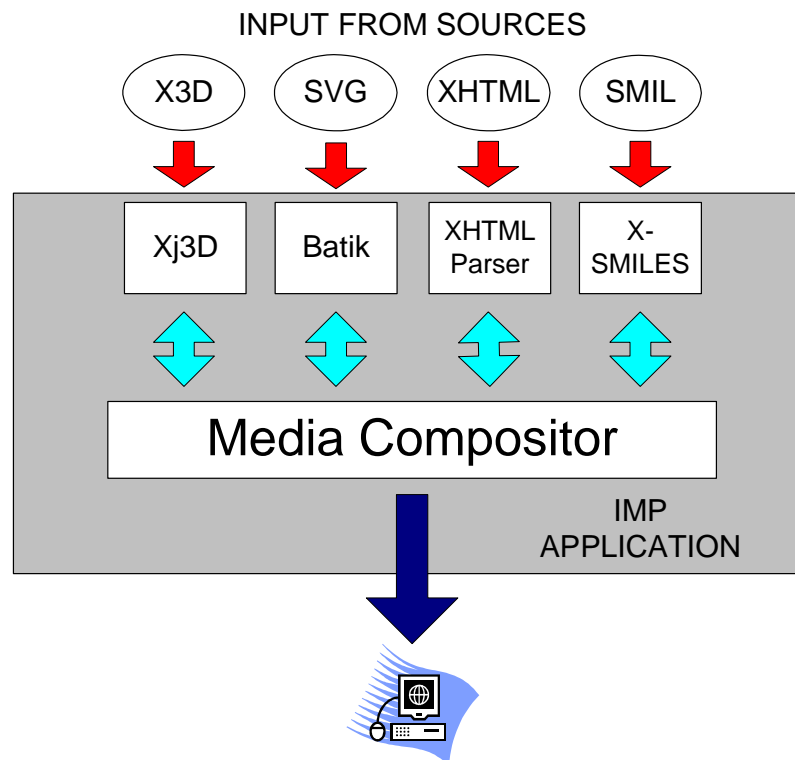


Figure 1: The Basic Structure of an IMP Application

The core element of IMP is the Media Compositor (MC). This component will be able to coordinate the data streams from various XML-based media players (for example, Xj3D and Batik) and combine them into a single view that is rendered on to the target device's screen in real-time. Data from an application is feed into the system either directly encoded using the appropriate XML languages or translated via XSLT. Initial decisions about the output device capabilities will determine the appropriate detail level too allow the content to scale effectively. This multi namespace document is then rendered by each media player and composed into a single view by the compositor. DOM access enables scripting support for dynamic changes.

An Exemplar

Current C3 systems for generating and disseminating orders can be improved by utilizing a variety of media streams delivered to different devices. Such a system can display command briefings on a PC, a 3D graphic walkthrough for mission training on a PC or immersive trainer, and field orders on a PDA—all in real-time. A common XML format for orders and other mission elements would allow this data to be combined into many different applications. Yumetech feels there are several advantages to this system that meet the needs of the XMSF group.

Various command levels use the system to generate orders. It converts these orders into 2D graphics presentation elements for command briefings, and constructs a 3D walkthrough of the target site for mission planning and training. It also translates these orders into text messages for transmission to the field via encrypted wireless devices. The system uses three XML media types: XHTML for the test messages, SVG for the command briefing slides, and X3D for the 3D walkthrough. Using the IMP Toolkit, an interactive viewer that is able to display all three media types is created for the various target devices. Command center and field personnel create, review and modify their orders while examining the 3D walkthrough. When they are completed, the XSLT system translates the orders into presentation slides using SVG. The command briefing slides can integrate the 3D walkthroughs and simulations using the IMP Viewer. During the briefing, orders can be further modified in real-time directly in the IMP Viewer. Once the orders are approved, the text-based orders are sent to the field via XHTML, and is displayed on the PDA Viewer.

Open Standards, Open Source and IMP

A key element in Yumetech's development plans for IMP is the company's plans to employ open standards and to place the core of the toolkit into the Open Source domain. We believe that this approach is the best method of providing cross-platform, stable and accepted standards for creating interoperable applications for M&S operations. It engages successful models for both military simulation and the Web, and ensures potential sponsors that their investments will continue to function even as technologies change. Moreover, our model makes it possible for programmers to develop greater efficiencies through the availability of open-source example implementations. At the same time, Yumetech anticipates further income through projects developed based on the Open Source toolkit.

For More Information

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