

This document is intended to outline criteria and the agencies for which 3D renderings for IBM will be evaluated. IBM's basic requirements will be presented to the listed agencies. They will need to present sample work and proof of concepts, as well as respond to the degree to which they can meet the requirements outlined herein.

3D Background

"3D" means that the output is in an interface that gives a user a three-dimensional, photo-realistic view of a product. The interface allows on-demand, real-time controls that typically allow Spin, Pan/Move, Zoom, and Reset of the rendering. Typically the technology is output for online/web viewing in Java (Virtual Machine, enabled on a browser), and in a simple plug-in-free executable that produces a similar window for viewing and controls.

It is important that the output of the software interface be in a single technology, preferably Java. Flash and other 2D content created by any agency or by IBM should be able to be imported and incorporated easily into the 3D system. Less than full integration of Flash are implementations such as (a) surrounding Java-based presentations with Flash player content, (b) using HTML graphics to surround and trigger the 3D content, or (c) pre-rendering and offloading movie clips into .swf files that are non-interactive. Solutions (a) and (b) typically use Java script for communication between Flash or HTML and the 3D Java applet. This typically results in cross-platform compatibility issues, generally including failure on Internet Explorer on Apple Macs. Approach (c) does overcome the problems inherent in (a) and (b) but results in large file sizes, as each pre-rendered frame has to be downloaded to the end user, and sacrifices true 3D / on-demand interactivity.

The reliance on proprietary plug-ins coupled with non-realistic 3D rendering has influenced companies with high imaging standards to offer interactive product tours to rely on 2D photography, within presentations typically designed in industry standard 2D design tools such as Macromedia Flash.

3D technologies for viewing online and offline files easily without the need for highly-sophisticated CAD programs and large files are being rapidly adopted. Holomatix has brought to the recent marketplace a way to produce and render a simple and web-friendly way to show products in 3D. Prior to the introduction of their proprietary "no plug-in" 3D system, the solutions that were available to offer interactive 3D presentations were plagued with drawbacks that have prohibited the mainstream adoption of 3D. These drawbacks include poor image rendering quality resulting in an artificial appearance, excessive bandwidth requirements and -above all - a requirement for the user to download and install a proprietary plug-in ranging from 1.0 to 3.5 megabytes in size.

There are a few off-the-shelf software packages being offered by with 3D rendering packages such as Demicron and Zeon. The ability to program into 3D must be gained by learning to photograph and program in the language provided by each 3D program.

Current Companies to Evaluate

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WW Market Management: Eric Helff (Gary Milner, Kevin Clark)
WW Communications: Dario Debarbieri (Lee Green)
Ibm.com - Pamela Chace (Tom Dekle)

Holomatix Background

Holomatix was established in early 2000 to develop and market 3D technologies for the Internet. They have provided a “no plug-in” 3D system, with an answer to the drawbacks that have prohibited the mainstream adoption of 3D in the past. They have developed proprietary technologies for 3D content creation and web display that have overcome all of these existing limitations and drawbacks. Their solution results in *photo-realistic* 3D product renderings, and does not require the viewer to download or install any proprietary software plug-ins.

Holomatix is both the developer of their own software as well as an agency that produces 3D renderings using their creative and programming resources. They have produced 3D products presentations for Nokia, Motorola Alcatel, Sagem, Sony Computer Entertainment, Sendo, Siemens, Adidas, Sony Ericsson, Orange, Kodak, Puma, Olympus, AlphaCell, and Groupe SEB among others.

ACG Background

ACG has been producing Flash-based presentations and product tours for IBM for several years. They have extensive knowledge programming in Flash 4, 5 and 6 , and produce much of the flash content for Intel including point of sale programs for PC's. ACG has very recently begun to experiment with 3D programs similar to Holomatix using an off-the-shelf 3D software package from Demicron.

Requirements

The following are the major factors in considering the adoption of an agency's 3D implementation at IBM.

1) Image quality.

- 0 As photo-realistic as possible - should be virtually impossible to discern from a high-resolution photograph.
- 1 Should represent accurate texturing, color and overall definition.

Image quality is generally best achieved through the following methods:

- A. **Anti-Aliasing.** The 3D technology should be able to enable anti-aliasing. 3D models displayed will otherwise “blur”, switching to a lower quality while the user is interacting with the 3D, and then settle to a higher resolution. This effect is called aliasing. The effect occurs as a result of under-sampling the image bitmaps and geometry when rendering. Anti-aliasing techniques apply both when the user interacts with the object and when the object is still. Anti-aliasing is to be active at all times without a significant impact on frame rate/ image rendering.

B. Image and geometry compression. High resolution files should be achieved at small file sizes (less than the JPEG itself) -- with an end result of smaller files that are able to render within an interactive image with the first 250Kb of streamed data. In addition, it should also have a very efficient and automated process for creating a self-projecting executable file at approximately 600KB or less for a 640 x 480 widow display. The output is expected to be in Java, utilizing the enabled Java Virtual Machine within a typical browser.

C. Lighting. Natural lighting will need to be simulated to allow a product to be displayed as it would look within its natural environment. This is achieved through applying unique environment maps to each individual texture within a product. The lighting effect should show to how the product would react in a natural environment as accurately as possible.

2) Online Viewing

IBM is seeking solutions that truly integrate photo-realistic 3D with Flash content, preferably with no plug-ins required except those included with recent versions of Internet Explorer and Netscape. The output for 3D online is expected to be Java, utilizing a browser with Java Virtual Machine enabled.

3) Flash compatibility and interactivity

Flash and other 2D content created by any agency or by IBM should be able to be imported and incorporated easily into the 3D system. IBM desires to reuse any of its digital assets (such as Flash) while creating a “seamless” experience of 3D interactivity on demand, without technology or bandwidth issues .

4) Translation and Text Editing. 3D renderings need to be designed to allow any owner / administrator to perform language translations with minimum difficulty and cost. IBM requires the ability to edit all text shown as output in a 3D interface, dynamic and static. It is preferred that this be accomplished via a simple external text file (.txt), not requiring special programs or programming skills, and which can be easily edited in any text editing program such as Word, WordPro, or NotePad). Offline files that are self-compressed may still require agency intervention to achieve a single self-executing file by incorporating the altered text file supplied by IBM.

5) Output Source File Editing. IBM will need to have the ability to edit the output source files in addition to the accompanying text file. The agency would be utilized to create the basic 3D model, the user interface, and the base features that are invoked by the user clicking on a set of predefined buttons. IBM will need to be able to make modifications to allow a new or altered feature or specific “snap-to” move that can be redefined and programmed. IBM will need the use of a software tool kit under license agreement or from the purchase of appropriate software. The tool kit will permit any user at IBM or designated agency to make alterations to the source code as necessary. Documentation and technical support from the must be made available from the software vendor to properly utilize the tool kit.

6) Output Source File Terms and Ownership. The agency of choice will need to work under an IBM Confidential Disclosure Agreement for all work. All output renderings and associated code produced by the agency of behalf of IBM, and any modifications made to it by IBM or any third party, including the agency itself, are allowable and the full property of the IBM Corporation. The output source code will be made available to IBM at all stages during production for review and modification. Agency and software used should permit output code to be used for all commercial and demonstrative purposes, in any medium whatsoever by IBM and its affiliates. These include but are not limited to not limited to public web sites, kiosks, training centers, IBM intranet, extranets, IBM Business Partner web sites, e-mail, and offline displays and demonstration purposes.

7) Projector / Offline Files. IBM and Business Partner sales and marketing professionals should be able to leverage all 3D assets offline. The 3D product tour should be able to be launched from a single executable file. A product’s 3D simulation should also be able to cycle through a series of motions in an automated loop and still be able to function as a user-controlled 3D rendering. In addition, and easily-scaled full screen version should be easily created with minimal cost from the original output source file (see Hardware Rendering below)

8) PowerPoint Viewing. IBM will require that the 3D assets be viewable in PowerPoint. It must be editable and easily manipulated in 3D in a presentation, as a user would any embedded image in a presentation. 3D should be viewable in edit mode and in printouts. It is allowable for the agency to provide a plug-in for Microsoft PowerPoint viewing purposes.

9) **Full-screen Rendering.** IBM will require that the agency be able to easily produce full-screen 3D of online (typically 640 x 480) of online versions of modeled products. This capability is expected to be a small additional cost of the base online version, since it should be sourced from the base 3D online model. A hardware renderer allows a user to view large-scale, full screen 3D at 100% resolution with full frame rate. This application is intended for kiosks, trade shows, and other promotional displays.

10) **.NET version.** On April 24th, 2003, Microsoft released .NET framework 1.1 which allows client-side rich media code execution from the Internet. This is Microsoft's answer to plug-in free client-side Java applets. Eventually this will become the platform of choice for rich media deployment on Windows XP and subsequent platforms and will need to be in the very near future plans for the software application used by or developed by the agency to fully support the platform.

11) **Photography / Imaging Process:** IBM will need to have the ability to utilize any of all the following options to be able to create 3D renderings based on practicality and other considerations including product availability. The agency will need to acknowledge their ability render 3D utilizing:

- an approved IBM photographer at their pre-negotiated IBM rates at an IBM location
- photographs of product taken at the agency under confidential conditions
- provide software-based CAD drawings

12) **Audio capability:** Agencies should demonstrate any audio capability with the 3D applet and convey the associated file formats and file sizes for typical 10 - 20 second narratives. Note that this is not a critical requirement for 3D applications, but is desirable.

13) **Technical Support & Project Management:** The agency will need to provide and demonstrate a system(s) by which project schedules will be managed and maintained, as well as an electronic delivery system for storyboards and files to be shared with IBM and any designated affiliates. It is expected that the system will be web-accessable, password-protected and firewall secure. Documentation and technical support must also be available during general business hours from the software vendor or agency to properly utilize the toolkits and associated 3D rendering software.