



Immersive Internet Analyst Report Series, Issue #4

The Enterprise Immersive Software Decision-Making Guide

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January 19, 2010

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EXECUTIVE SUMMARY

The trailblazers who are including enterprise immersive technology in their business decisions make up a diverse set of marketing executives, corporate events managers, human resource strategists, program or project managers, and chief learning officers. Applying an emerging technology to such a wide variety of use cases is tough enough, but for many of these innovators, technology selection may not even be part of their everyday jobs.

For such trailblazers we have created this report, a use case-based guide designed to aid in the enterprise immersive software selection process. We present “if/then” scenarios and highlight good-fit vendors for common situations. While immersive software can be applied in many ways, this report focuses on the most common use cases: meetings, conferences, and learning and training. Here, you will not find vendors pitted against one another on a mammoth feature/function checklist nor any single vendor crowned as The Leader — impossible in a market that is small, fragmented, volatile, and characterized by fast-changing technology.

The key question is, “What business problem(s) are you trying to solve?” All other questions flow from this one. This report offers guidance on how to: 1) ask core business questions to frame the discussion, 2) choose a research-and-demo, do-it-yourself, or combination approach, 3) identify requirements based on your use case, and 4) filter your options based on important limiters.

Once use case-based requirements are understood, an assessment of limiters can narrow the list of suitable vendor options. Limiters might include security concerns, budget, scalability needs, system integration requirements, existing skill sets, and technology pre-requisites (e.g., graphics card, processing power, or computer headset). For most early adopters, cost is near the top of the list. In some sectors, such as government and military, security is of utmost importance.

To develop this decision-making guide, ThinkBalm analysts held structured briefings with nineteen enterprise immersive software vendors and conducted interviews with fifteen Immersive Internet advocates and implementers. Some of the briefings took place directly in the vendors’ immersive environments. We combined our insights from these discussions with our hands-on experience using immersive software and our interactions with our clients and members of the ThinkBalm Innovation Community. The ThinkBalm Innovation Community currently numbers more than 400 Immersive Internet advocates, implementers, explorers, and technology marketers.

WHAT IS ENTERPRISE IMMERSIVE SOFTWARE?

Enterprise immersive software is an emerging technology category that is core to the Immersive Internet evolution.¹ Enterprise immersive software is:

A collection of collaboration, communication, and productivity tools unified via a 3D or pseudo-3D visual environment.² In this computer-generated environment, one or more people engage in work activities such as training, rehearsing business activities, delivering presentations, attending trade shows, collaborating on documents, brainstorming, visualizing data, and building or testing prototypes. The software provides a shared, interactive, multichannel experience through presence awareness, voice chat, active speaker indication, text chat, and many other features, often including avatars. The software can be installed behind the firewall, delivered on a hardware appliance, or accessed via a software as a service (SaaS) offering.

The term “enterprise” in the category name indicates that solutions are suitable for use in the workplace, as opposed to recreational use (e.g., consumer video games and virtual worlds), and are scalable, secure, and stable enough for at least some use cases. Because the enterprise immersive software market evolved out of several distinct origins, software products in the category vary widely in features and functionality.³

SOFTWARE SELECTION IS CHALLENGING IN AN EMERGING MARKET

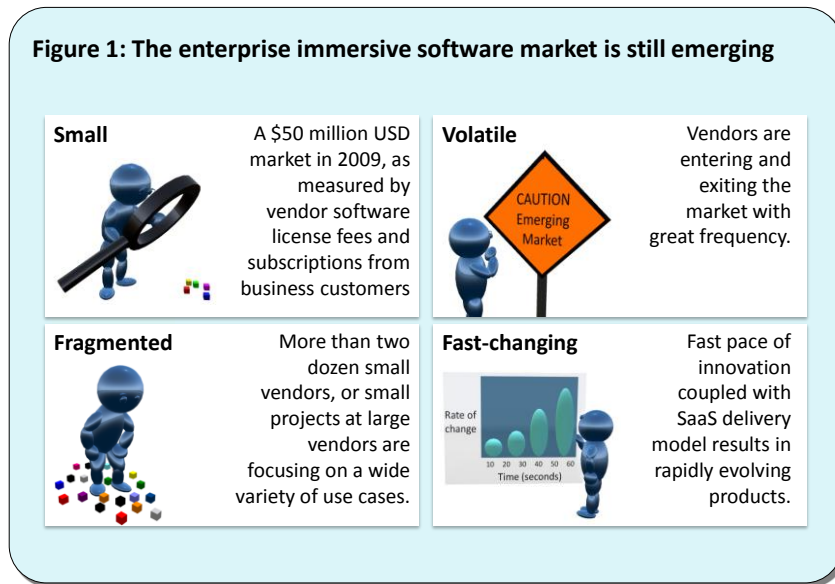
In more mature software categories, such as accounting packages or enterprise collaboration platforms, an abundance of information and decision support resources is available to business decision makers. Emerging technology markets such as enterprise immersive software are different (see Figure 1). Early adopters are on their own, with little guidance from those who have gone before. Brian Ralphs, technology director at BP, described it succinctly: “There are not too many people to learn from in this area.” Kelly Graham, manager of the virtual event strategy and shared services group at Cisco Systems, said, “Did we have challenges along the way? Sure. Sometimes these were vendor issues but mostly it was due to our lack of knowledge. With new technology like this, you don’t know what you don’t know.”

¹ ThinkBalm defines the Immersive Internet as “a collection of emerging technologies combined with a social culture that has roots in gaming and virtual worlds.” For more information see this ThinkBalm Web page: <http://www.thinkbalm.com/immersive-internet/>.

² 3D environments use three-dimensional representations of geometric data to create immersive environments and experiences in which avatars can move and interact. Pseudo-3D environments assemble 2D images of 3D scenes (typically using Adobe Flash) to create the illusion that the user is in a 3D environment. Users do not have avatars that can navigate through the environment. By limiting graphical rendering, pseudo-3D environments offer scalability orders of magnitude higher than 3D environments.

³ Enterprise immersive software grew out of several distinct ancestral origins: virtual worlds, serious games, business applications, webcasting, and learning simulations. For more information see the November 17, 2008 ThinkBalm report, [The Immersive Internet: Make Tactical Moves Today for Strategic Advantage Tomorrow](#).

Figure 1: The enterprise immersive software market is still emerging



The enterprise immersive software market is:

- Small.** We size the enterprise immersive software market at \$50M USD in 2009. This conservative number includes only revenue from software licenses and maintenance fees, appliance sales, and subscription fees collected from customers who were using the software for work (as opposed to recreational uses). We did not include revenue from professional services (e.g., custom development projects and implementation services).
- Volatile.** New vendors are entering the market and others are leaving. During the research and writing of this report we discovered two new companies: A World for Us and Amphisocial. During the same period, one vendor was acquired (Nortel by Avaya), another is in the process of being acquired (Sun Microsystems by Oracle), and a third laid off nearly half of its workforce (Forterra Systems).⁴ Earlier in 2009, Virtual Heroes was acquired by Applied Research Associates.⁵ Many of the vendors are actively seeking outside funding and not all of them will get what they need to reach their target customers or even continue operations. We expect to see additional churn in 2010 and 2011.
- Fragmented.** ThinkBalm is tracking about two dozen enterprise immersive software vendors. For this report we conducted structured briefings with 19 of them (see Figure 2 and Figure 3). All of the providers are small companies or small, experimental teams at large companies (e.g., Avaya, IBM, and Sun Microsystems). No market leader has yet emerged. We estimate that none of the

⁴ In the month between November 20th and December 23rd, 2009, Forterra Systems laid off nearly half of its workforce. For more information see the December 23, 2009 ThinkBalm blog article, "[Forterra Systems layoffs have implications for the enterprise immersive software market.](#)" In December of 2009, Avaya acquired Nortel Enterprise Solutions, the business unit that was home to the web.alive product. For more information see the December 18, 2009 press release, "[Avaya completes acquisition of Nortel Enterprise Solutions.](#)"

⁵ In April of 2009, Applied Research Associates announced that it had acquired Virtual Heroes. For more information, see the April 26, 2009 press release, "[Applied Research Associates, Inc. acquires Virtual Heroes, Inc.](#)"

vendors in this emerging market had 2009 enterprise immersive software revenues (licenses, subscriptions, and maintenance fees) greater than \$15M USD — and most brought in significantly less than this. We estimate that fewer than half of them were profitable in 2009 — these include IBM, InXpo, Linden Lab, ON24, ProtonMedia, ReactionGrid, VastPark, and Virtual Italian Parks.

- Characterized by fast-changing technology.** Caroline Avey, learning strategist with ACS Learning Services, put it this way, “This technology is changing so fast. New functionality comes out all the time. One of our vendors makes updates every week. The choice of which technology is best can change in a matter of months or even weeks.” Development cycles are short and the SaaS model enables vendors to make new functionality available to customers immediately. The stability, versatility, and utility of enterprise immersive software are improving quickly. During the past 18 months, we have seen unreliable products evolve to relative stability, and the average maximum number of avatars able to assemble in the same virtual space increase from roughly 20 to 60-100.

Figure 2: Enterprise immersive software vendors interviewed for this report (part 1)

| Vendor | Product name | Brief description |
|-----------------------------------|--|---|
| A World for Us | Assemb'Live | Web-based (with plug-in), SaaS only, built on Unity3D |
| Altadyn | 3DXplorer | Web-based, written in Java |
| Amphisocial | PIIVOT Tatkaal | SaaS only, runs on OpenSim or Project Wonderland |
| | PIIVOT Dhruva | Customized, SaaS only, runs on OpenSim or Project Wonderland |
| American Research Institute (ARI) | PowerU | Serious game engine built on Icarus Studios platform |
| Avaya | web.alive | Web-based (with plug-in), built on Unreal Engine |
| Forterra Systems | OLIVE | Collaboration platform and apps with strong focus on simulation |
| | Meeting Labs | SaaS only, for meetings, built on Forterra OLIVE |
| IBM | Virtual Collaboration for Lotus Sametime | Professional services offering built on OpenSim |
| InXpo | InXpo Virtual Events Platform | Pseudo-3D, Web-based virtual event platform |
| Linden Lab | Second Life | Public virtual world, platform and toolkit |
| | Second Life Enterprise | Appliance running Second Life software, platform and toolkit |
| ON24 | Virtual Show | Pseudo-3D, Web-based virtual event platform |
| | Virtual Briefing Center | Pseudo-3D, Web-based persistent environment |

Source: ThinkBalm

Figure 3: Enterprise immersive software vendors interviewed for this report (part 2)

| Vendor | Product name | Brief description |
|-----------------------|--|--|
| ProtonMedia | ProtoSphere | Collaboration environment built on Microsoft platform |
| ReactionGrid | ReactionGrid | Public virtual world built on, platform and toolkit |
| | Harmony | Appliance running OpenSim, platform and toolkit |
| Rivers Run Red | Immersive Workspaces | Collaboration app built on Second Life |
| Sun Microsystems | Project Wonderland | Open source project written in Java |
| Teleplace | Teleplace | Collaboration environment built on Croquet |
| Unisfair | Unisfair Virtual Engagement Platform | Pseudo-3D virtual event platform |
| VastPark | VastPark | Open source platform and toolkit built on Microsoft platform |
| VenueGen | VenueGen | SaaS only, built on Icarus platform |
| Virtual Italian Parks | Moondus Places | Collaboration environment built using Moondus software development kit |

Source: ThinkBalm

No Single Product Will Meet All Your Needs

The vendors come from a variety of backgrounds and have different specializations and strengths and weaknesses. They are not all targeting the same use cases. Just as office productivity suites today now include separate-yet-integrated applications for word processing, spreadsheets, presentations, and more, immersive software product suites will evolve to focus on groups of related business problems. Eventually, we envision an immersion layer developing that will integrate with multiple enterprise systems and applications.⁶ But this is years away.

IT professional Charles O’Connell offered this advice: “Be guarded about rushing toward a single choice for all uses. I expect multiple products in the mix for quite a long time because the potential applications are so broad. There may never be just one product for us.” Nina Nussbaum-Jones, senior engineer with Lockheed Martin, said, “We have learned that we should use one product for training and another one for data visualization. One size never fits all.”

Early Adopters Are Looking Beyond the Challenges to the Benefits

Early adopters have been willing to deal with these typical early-market challenges because initial indicators show that the potential benefits and business value of immersive technology outweigh the

⁶ An immersion layer will provide a broad set of components for information workers, as well as functionality specialized to job roles. It will integrate with enterprise collaboration platforms, apps, and databases, as well as external data sources. Potential contenders to deliver this immersion layer include Avaya, Cisco, Google, IBM, and Microsoft. See the January 23, 2009 ThinkBalm blog article, “[IBM Lotus approach to Immersive Internet: partnering and professional services.](#)”

costs and challenges. In a spring, 2009 ThinkBalm survey of Immersive Internet advocates and implementers, more than 40% of those surveyed (26 of 66) saw a positive total economic benefit from their investments in 2008 and 1Q 2009, and more than 50% of respondents (34 of 65) expected to obtain a positive total economic benefit before the end of 2009.⁷ Quantification of this value was all over the map, ranging from less than \$10,000 USD to more than \$1 million. While the enterprise immersive software market today is small and emerging, and we are facing “the chasm,” signs point to early mainstream adoption in a three-year timeframe — we are targeting 2013.⁸

BUSINESS DECISION MAKERS ARE IN THE DRIVER’S SEAT

The enterprise immersive software market is in the early adopter phase of the technology adoption lifecycle.⁹ Adoption during this phase is driven by business decision makers, rather than technologists or enthusiasts. This phase is about the marketing executive, corporate events manager, human resources strategist, project or program manager, or chief learning officer who faces budget cuts, resource constraints, or an innovation imperative, and sees immersive software’s potential to solve a business problem. Enterprise immersive software business decision makers:

- **Are trailblazers.** Use of immersive technology for meetings, conferences, and learning and training is a new phenomenon. Brian Ralphs, technology director at BP, said, “We know it’s early. Few other large corporations are there. We are prepared to take chances and experiment. The down side of being early is you have to engage in a trial and error approach to make progress.” Paulette Robinson, assistant dean for teaching and learning at National Defense University iCollege, described her organization’s trailblazing: “We are even inventing processes. We are working on an interagency process for selecting immersive technology.”
- **Have diverse business roles and functions.** Because immersive software has such wide-ranging applicability, business decision makers looking to adopt it are not a uniform group. For this report, we interviewed people with titles like learning strategist, manager of virtual event strategy and shared services, CEO, marketing communications senior consultant, innovation

⁷ The number of respondents who expected to obtain economic benefit of \$25,000 USD or more in 2009 was over double the number who indicated they achieved this level for 2008 / 1Q 2009. See the May 26, 2009 ThinkBalm report, [ThinkBalm Immersive Internet Business Value Study, Q2 2009](#).

⁸ By this we mean that enterprise immersive software will have a significant installed base within Global 1000 companies and large public sector organizations and at least a few successful very large-scale implementations. See the September 23, 2009 ThinkBalm report, [Crossing the Chasm, One Implementation at a Time](#). We expect adoption of enterprise immersive software to reach the early majority in 2013 for several reasons: early case studies demonstrate return on investment; rapid advancements are occurring in hardware, software, and networking technology; the economy is slow and the green movement is hot; we live in a video game culture; large business technology vendors have entered the fray; and the prevalence of social networking, which makes it easy for innovators and early adopters to connect with each other. See the November 17, 2008 ThinkBalm report, [The Immersive Internet: Make Tactical Moves Today for Strategic Advantage Tomorrow](#).

⁹ [Geoffrey Moore](#) wrote extensively about the technology adoption lifecycle in *Crossing the Chasm* and other books. In November of 2008 we characterized the Immersive Internet market as being in the “seedling” stage of adoption (the innovator phase). See the November 17, 2008 ThinkBalm report, [The Immersive Internet: Make Tactical Moves Today for Strategic Advantage Tomorrow](#). By May of 2009, adoption had crossed over from the innovator phase to the early adopter phase. See the May 26, 2009 ThinkBalm report, [The Enterprise Immersive Internet Business Value Study, Q2 2009](#).

evangelist, senior developer evangelist, VP of marketing innovation, and assistant dean for teaching, learning, and technology.

- **Are focused on a wide variety of use cases.** The most common use cases for 2009 and 2010 are learning and training, meetings, and conferences.¹⁰ But we have talked with business and technology decision makers who are focused on other uses like collaborative prototyping, human resources management, data visualization, sales and marketing, and remote system and facility operations. Several of the people we interviewed plan to use the software for situation rooms and communities of practice.¹¹
- **Recognize and adapt to the challenges of choosing the right solution.** We are hearing stories about teams that selected a vendor and later look back on it as a “learning experience.” Peter Meli, CEO of The Coaches Centre, said, “None of the vendors offers everything we need. We’ve learned from our experiences how to craft better questions. We also learned to do a great deal more due diligence and not necessarily believe everything we hear.” Rob Halsey, VP of marketing innovation at SAP said, “When selecting a solution, you need to consider things like project management skill, understanding of conference events, how people actually consume content and interact, and technology underpinnings. These factors drive success as much as functionality and require their own deep evaluations.”

HOW TO CHOOSE THE RIGHT ENTERPRISE IMMERSIVE SOFTWARE

Few early adopters have a formal process in place for selecting immersive software. This is not surprising, as many of them are business people for whom technology selection is not an everyday task. Laura P. Thomas, marketing communications senior consultant at Dell, said, “Our standard software procurement process wasn’t really prepared for this type of product selection. We experimented with one vendor because it was the one we were hearing about. We piloted another product because the vendor reached out to us and gave us a briefing.” As the enterprise immersive software market matures and this technology moves into the bailiwick of corporate IT, the evaluation process will become more formalized. In the meantime, we recommend that business decision makers take the following steps.

Four steps

1. Ask business questions
2. Choose your approach
3. Identify requirements
4. Filter using limiters

¹⁰ In Q2, 2009 ThinkBalm surveyed Immersive Internet advocates and implementers about business value. In answer to the question, “For which of the following use cases did your organization pilot or deploy immersive technology in 2008 or 1Q 2009?” 80% of respondents (53 of 66) selected learning and training; 76% (50 of 66) selected meetings; and 49% (32 of 66) selected conferences. We also asked, “For the remainder of 2009, and for 2010 and 2011, what is the likelihood of your organization using immersive technology for each of the following use cases?” Meetings, conferences, and learning and training had the highest likelihoods. See the May 26, 2009 ThinkBalm report, [The Enterprise Immersive Internet Business Value Study, Q2 2009](#).

¹¹ In August of 2009, ThinkBalm released a ThinkBalm Innovation Community work product — a video titled “The Bridge.” This video demonstrates the concepts and value of a 3D immersive situation room, or war room, which the community decided to call a bridge, after the bridge on a ship. The bridge is the place from which the ship is commanded. Watch the video here: <http://www.youtube.com/watch?v=KITk8dRI9f4>.

Frame the Discussion with Core Business Questions

It is vital to begin the software selection process by discussing core business questions (see Figure 4). These questions are important no matter which use case(s) you are targeting. Some questions may lead to requirements that are so critical they override other decision factors — for example, ease of use, security requirements, or particular must-have features.

Figure 4: Frame the discussion with core business questions

| Business question | Implications for immersive software selection |
|---|--|
| What business problem(s) are you trying to solve? | Match the problem(s) you're trying to solve with one or more use cases. Your target use may include meetings, conferences, learning and training, sales and marketing, collaborative prototyping, data visualization, human resources management, remote system and facility operations, or other cases. Versatility of the software might be an important evaluation criterion if you are targeting multiple use cases. |
| What experience(s) do you want to create and deliver? | Immersive environments are all about engagement, which comes from users having memorable experiences. The kind of experience you want to create will heavily determine the features and functionality you require (see Figure 5 and Figure 6). |
| How will you measure success? | Measuring return on investment (ROI) has implications for the technology selection process. You may require built-in metrics functionality, such as lead generation for conferences and scores or grades for learning. Also, you may wish to evaluate vendors' ability to help you demonstrate business value (which may be ROI or other outcomes). |

Source: ThinkBalm

In our interviews with Immersive Internet advocates and implementers, we asked what the most important factors were in the technology selection process. While many answered that security or cost was the most important factor, others based their decisions on the experiences they wanted to deliver via the immersive environment. Cherisa Burk, technology specialist at the Federal Reserve Bank of New York, said, "We wanted it to be self-explanatory once the user got their avatar into the meeting room or collaboration space. We wanted them to be able to get started in the first half hour. We were looking for ease of use and out-of-the-box functionality." Nina Nussbaum-Jones, senior engineer at Lockheed Martin, said her team was seeking to increase the immersion and engagement of training sessions and meetings. Her team selected a platform and toolkit they believe will allow the team to create experiences that involve multiple senses in the work experience.¹²

¹² For more insight into the process Nina Nussbaum-Jones' team at Lockheed Martin went through to select Sun Project Wonderland, see Nussbaum-Jones' November 9, 2009 guest post on the Sun Microsystems Wonderblog blog, "[Writing a story, starting a movement.](#)"

Figure 5: Requirements arise out of the experiences you want to create and deliver (part one)

| If you want . . . | . . . Then look for: |
|---|--|
| Distributed team members to feel like they are together in the same place at the same time, to create a sense of camaraderie and loyalty and to increase productivity | Avatars, 3D voice (so that the voice of an avatar to your left comes from your left speaker, and the voice of an avatar close to you is louder than that of an avatar farther away), and a visual means of identifying who is the active speaker. Vendors that provide these features include A World for Us, Amphisocial, ARI, Avaya, Forterra, IBM, Linden Lab, ProtonMedia, Rivers Run Red, Sun Microsystems, Teleplace, VastPark, VenueGen, and Virtual Italian Parks. |
| To limit the frustration of learning to use new software by making sure the software works as advertised and is stable | Vendors that have products that are generally available (GA) and can provide reference customers. Vendors with GA products include Altadyn, ARI, Forterra (OLIVE), IBM, InXpo, Linden Lab (Second Life), ON24, ProtonMedia, Rivers Run Red, Teleplace, Unisfair, and Virtual Italian Parks. Products that are alpha or beta include A World for Us Assemb'Live, Amphisocial PIIVOT Tatkaal and PIIVOT Dhruva, Avaya web.alive, Forterra Meeting Labs, Linden Lab Second Life Enterprise, VastPark, and VenueGen. (Though VastPark's technology has been in use since 2007.) |
| To give people a high-quality meeting experience even if they have old computers or don't have permission to install software on their machines | A Web-based solution from vendors like A World for Us, Altadyn, Avaya, ON24, InXpo, Unisfair, or VenueGen. Some of these (e.g., A World for Us, Avaya, and VenueGen) require a browser plug-in, which may interfere with permissions settings on users' machines. Teleplace provides the ability to webcast the video and audio of a session taking place in the environment out to a web browser. |
| To bring your sales force of 10,000 people together for a kickoff event, complete with breakout training sessions and networking opportunities | Extreme scalability, as measured by the number of people who can be in the same virtual space at the same time (e.g., attending the CEO's keynote speech). ARI, Avaya, and VastPark can support hundreds of users in the same virtual space at the same time, without special tuning of their software. InXpo, ON24, and Unisfair can support tens of thousands; keep in mind that because people are not represented by an avatar in pseudo-3D environments, "being in the same place at the same time" means viewing the same live or recorded keynote presentation video, and being able to communicate with all others viewing it, simultaneously. |
| To increase the productivity of weekly team meetings | Voice chat, text chat, and screen or file sharing. Vendors strong in these areas include Amphisocial, Avaya, Forterra Systems, IBM, Linden Lab, ProtonMedia, ReactionGrid, Rivers Run Red, Sun Microsystems, Teleplace, VastPark, VenueGen, and Virtual Italian Parks. |
| To deliver interactive certification courses and record test scores and learner certifications in a learning management system (LMS) | Support for the sharable content object reference model (SCORM) specification and integration with LMSs. ¹³ Vendors that meet these criteria include ARI, Forterra Systems, and ProtonMedia. Avaya does not support SCORM but has integrated with a customer's LMS. Linden Lab's ecosystem includes solution providers that have developed SCORM-compliant applications. |

Source: ThinkBalm

¹³ For more information about the SCORM specification see this Advanced Distributed Learning Web page: <http://www.adlnet.gov/Technologies/scorm/default.aspx>.

Figure 6: Requirements arise out of the experiences you want to create and deliver (part two)

| If you want . . . | . . . Then look for: |
|--|---|
| To encourage ad hoc brainstorming and prototyping sessions, with the aim of fostering greater innovation | Collaboration tools for mind-mapping and whiteboarding. Vendors that offer these kinds of tools include Amphisocial, IBM, Linden Lab, ReactionGrid, Rivers Run Red, Sun Microsystems, Teleplace, and Virtual Italian Parks. |
| Managers of engineering, tech support, product management, and marketing to collaboratively develop product prototypes faster at lower cost | Support for the COLLADA standard or ability to import 3D models directly from external systems like 3D Studio Max and Maya. ¹⁴ Vendors that enable this include A World for Us, Altadyn, Amphisocial, ARI, Avaya, Forterra, ProtonMedia, Sun Microsystems, Teleplace, VastPark, and Virtual Italian Parks. |
| To create and constantly tweak engaging new-hire training experiences that create a good impression on employees and result in increased knowledge retention | A platform and toolkit. Vendors include Altadyn, Amphisocial, ARI, Forterra, IBM, InXpo, Linden Lab, ON24, ReactionGrid, Rivers Run Red, Sun Microsystems, Teleplace, VastPark, and Virtual Italian Parks. Some of these require deeper programming expertise than others. |
| Sales or support staff to provide a high level of hands-on service to customers, partners, or suppliers | A public virtual world like ReactionGrid or Second Life; Web-based software (e.g., A World for Us Assemb'Live, Altadyn 3DXplorer, Avaya web.alive, ON24, InXpo, Unisfair, or VenueGen); or software that can be configured to allow external users to easily enter the immersive space. |

Source: ThinkBalm

Choose Your Approach: Research-and-Demo, DIY, or a Combination of Both

We recommend two technology selection approaches: research-and-demo and DIY (see Figure 7). When time and resources permit, these approaches can be combined into one comprehensive approach.

We recommend that project teams:

- Take the DIY approach to gain deep hands-on insights.** Zain Naboulsi, senior developer evangelist at Microsoft, said, “We made our choices based on trial and error — hands-on experiences. This is the best way to do it. It can’t be done by looking at a bunch of spreadsheets.” Caroline Avey, learning strategist at ACS Learning Services, said, “In our organization we are using six different immersive environments. We take each environment for a test drive and see if we can break it. We see how far it can go, and try to identify IT issues we’ll come up against.” Nina Nussbaum-Jones, senior engineer with Lockheed Martin, said, “We read everything we could get our hands on, downloaded free software, and installed trial versions of the software that cost money. We reached out to others in our company to see what they are using.” Mark Oehlert, innovation evangelist at Defense Acquisition University, said, “We are in the process now of installing and looking at a lot of virtual world technologies right now to get an idea of how we will shape the development of our enterprise virtual world.”

¹⁴ COLLADA, which is short for a Collaborative Design Activity, is an open standard digital asset schema for interactive 3D applications. For more information see <http://www.collada.org>.

- Pursue the research-and-demo approach when time and resources are limited.** Brian Ralphs, technology director at BP, said, “Largely because we have been in the vanguard of trying these things out, it’s been a matter of searching the Web, attending conferences, learning about new tools, and having conversations with people in the know. We learn about a vendor, contact them, and arrange a demo. If we like what we see and feel there is a suitable business opportunity, we take it further and set up a proof of concept.” Kimberly Stone, manager of web and creative services at Planview, said, “We started with a list of features from our physical conference. We got the core group together and made sure we had the complete list. Then I went to the Virtual Edge conference. I attended part of the conference physically and part virtually, from my hotel room. I came back with some good practices and information about the leading vendors. We translated our tentative requirements into something more solid and then went through it with the vendors.”

Figure 7: Research-and-demo and DIY technology selection approaches start with the same first steps

| | | |
|----|--|---|
| 1 | Identify and document the business problem(s). Determine which use case(s) you want to target. | |
| 2 | Compile a list of requirements based on business need(s). Separate nice-to-haves from deal-breakers. | |
| 3 | Conduct research to identify vendors and products. Read articles, reports, and books about work-related use of immersive software. Reach out to experts, attend conferences and learning events, and join focused social networks. | |
| | The DIY approach | Research-and-demo approach |
| 4 | Download and install software, or create accounts in Web-based environments. | Set up briefings with vendors of interest. |
| 5 | Explore each immersive environment, assessing its suitability to the business problem. | Get demos of the vendors’ offerings. Ask how they meet your requirements. |
| 6 | Hold mock or real meetings, training sessions, etc. in the environments. | Attend events held in the immersive environments under consideration. |
| 7 | Compare the vendors and products and document your findings. | |
| 8 | Speak with multiple reference customers in your industry or focused on your use case. | |
| 9 | Narrow your options to a short list of products to pilot. | |
| 10 | Document metrics for success. | |
| 11 | Conduct one or more pilots. | |

Source: ThinkBalm

Identify Requirements Based on Use Case

The number one question is, “What business problem are you trying to solve?” It is from the answer to this question that all others flow, and it is this question that ultimately determines which vendors offer the best-fit products. Rob Halsey, VP of marketing innovation at SAP said, “I recommend figuring out how to make the vendor selection process use-case based. At the end of the day, customers need to use this

technology to solve a business problem.” IT professional Charles O’Connell said, “In my enterprise architecture role, we’re always trying to simplify the environment. But this is not a single category. It’s not just virtual worlds. What *kind* of virtual world? What use case?”

A few things to keep in mind:

- **This report covers just the three most common use cases.** ThinkBalm is covering nine Immersive Internet use cases. This report focuses on the most common of these — meetings, conferences, and learning and training — and further segments them: small meetings, presentation-style and collaborative, large meetings, conferences, classroom-style training, and simple hands-on learning simulations. Business activity rehearsals as a form of learning can be conducted in many kinds of immersive environments, depending on the type of activity and the learning objective.
- **Complex, sophisticated learning simulations are outside the scope of this report.** Complex simulations involve highly customized 3D environments such as oil refinery assets, battleships, jet engines, or factory floors. In these environments workers may learn how to take a factory floor offline and bring it back up, for instance, or inspect an oil rig or commercial airliner or orchestrate a large-scale emergency response. This use case typically requires specialized software, extensive customization, and deep system integration.
- **The common use cases have similarities — but also important differences.** While meetings, conferences, and training have elements in common (e.g., presenters deliver and attendees listen to presentations, participants share and obtain information, and participants build relationships), important differences exist. We have compiled a baseline set of functional requirements for the use cases covered in this report (see Figure 8). Not all features are equally important for each use case — and they vary from one project or organization to another.
- **Use our suggested requirements as a guide or starting point.** Every organization will have its own requirements list. Security requirements and budget constraints are likely to be high on the list. Additional requirements might include functionality like a sophisticated physics engine, integration with LMSs for test score and certification reporting, artificial intelligence (“bot”) support for learning simulations, and the ability to import 3D computer-aided design (CAD) models. Also, consider factors like the characteristics of the target user population, the degree to which your organization would have control over source code, and the skill sets available for customizing and/or supporting the software.

Figure 8: Feature requirements for meetings, conferences, and learning and training use cases

| | Meetings and conferences | | | | Learning and training | |
|----------------------------|----------------------------|-----------------------------|-----------|-------------------------|-----------------------|-------------------|
| | Small mtgs. (presentation) | Small mtgs. (collaboration) | Lg. mtgs. | Conferences/trade shows | Classroom-style | Simple simulation |
| Productivity tools | | | | | | |
| Attention focusing tool | ● | ● | ● | ● | ● | ○ |
| Presenter screen sharing | ● | ● | ● | ● | ● | ○ |
| Video streaming | ◐ | ◐ | ● | ● | ● | ◐ |
| File sharing | ◐ | ● | ◐ | ● | ● | ◐ |
| Polling and voting/quiz | ○ | ● | ◐ | ◐ | ◐ | ◐ |
| Whiteboarding | ◐ | ● | ○ | ○ | ◐ | ○ |
| Brainstorm/mindmap | ○ | ● | ○ | ○ | ◐ | ○ |
| Breakout rooms | ○ | ○ | ◐ | ● | ○ | ○ |
| User roles | ◐ | ○ | ● | ● | ● | ● |
| Session recording | ◐ | ◐ | ◐ | ◐ | ● | ● |
| Communication tools | | | | | | |
| Voice chat (local) | ● | ● | ● | ● | ● | ● |
| Text chat (local) | ● | ● | ● | ● | ● | ● |
| Text chat (private) | ● | ● | ● | ● | ● | ◐ |
| Text chat (group) | ● | ◐ | ● | ● | ◐ | ◐ |
| Gestures/emotes | ● | ● | ◐ | ◐ | ● | ● |
| Voice chat (private) | ◐ | ◐ | ● | ● | ● | ◐ |
| Voice chat (group) | ◐ | ◐ | ● | ◐ | ◐ | ◐ |
| Telephony integration | ◐ | ◐ | ◐ | ◐ | ○ | ○ |
| Social networking | | | | | | |
| Profile | ● | ● | ● | ● | ● | ● |
| Groups | ● | ● | ● | ● | ● | ○ |
| Social network integration | ◐ | ◐ | ◐ | ● | ◐ | ◐ |
| Connection suggestions | ○ | ○ | ◐ | ◐ | ○ | ○ |
| Friends | ○ | ○ | ● | ● | ○ | ○ |
| SCORM support | ○ | ○ | ○ | ○ | ◐ | ◐ |
| Metrics/measurement | | | | | | |
| Learning | ○ | ○ | ○ | ◐ | ● | ● |
| Social networking | ○ | ○ | ◐ | ● | ◐ | ◐ |
| Usage and traffic patterns | ○ | ○ | ○ | ● | ◐ | ● |

KEY

- Full circle ● Important, in most cases
- Half circle ◐ Optional, in many cases
- Empty circle ○ Unnecessary in many cases

Source: ThinkBalm

Small Meetings Can Be Presentation-Style or Collaborative

The most basic use case for immersive software is the small meeting, which typically has a few to a few dozen participants. Participants are represented in a 3D environment by an avatar that can move in space and communicate with others via voice (ideally 3D voice so that the voice of an avatar to your left comes from your left speaker, and the voice of an avatar close to you is louder than that of an avatar farther away), text chat, gestures and animations, and avatar location and direction. Presentation-style meetings have a primary presenter, with other participants listening and asking questions. PowerPoint tends to play a central role. For collaborative meetings, all participants share the communication channels and control of the floor. Examples of collaborative meetings might include document reviews, brainstorming sessions, and blue-sky “what-if” conversations.

Small meetings

Most vendors covered in this report can address small, presentation-style meetings. Many also offer at least some additional out-of-box tools for collaborative meetings.

For small meetings:

- **Presentation-style meetings have the most basic requirements.** Participants need communication tools (especially local voice and text chat — which means people can chat with others in their proximity) and screen or file sharing. Nice-to-haves include a pointer or other attention-focusing device and video sharing. All the vendors covered in this report can address the small presentation-style meeting use case, although it is uncommon to use virtual event platforms (e.g., InXpo, ON24, and Unisfair) for this purpose. Some vendors (Altadyn, ON24, and Unisfair) are missing a critical piece of basic functionality: built-in voice over Internet protocol (VoIP) for chat among meeting participants. IBM offers VoIP as an add-on and Altadyn and Unisfair integrate with Skype.
- **Collaborative meetings benefit from additional productivity tools.** Above and beyond the functionality required for presentation-style meetings, collaborative meetings benefit from such functionality as drag-and-drop office document integration, shared whiteboarding, shared web browsing, brainstorming tools, streaming video support, and voting and polling. Vendors with strength in productivity tools include Amphisocial, IBM, ProtonMedia, ReactionGrid, Rivers Run Red, Sun Microsystems, Teleplace, and VastPark. Forterra, Sun Microsystems, and Teleplace provide drag-and-drop integration for some office documents and, in the case of Sun and Teleplace, 3D objects. ARI, Avaya, Teleplace, VastPark, VenueGen, and Virtual Italian Parks provide shared Web browsing, meaning all participants can interact with the shared Web content (at least content that doesn’t require a login). While Linden Lab doesn’t provide strong productivity tools on its own, the company has a large ecosystem of third-party providers that have created add-on, third-party collaboration tools. ProtonMedia, VenueGen, and other vendors are working on additional collaboration tools for upcoming near-term product releases.
- **Vendors differentiate with integration and additional collaboration and productivity tools.** Avaya provides bi-directional integration with web applications. Sun Project Wonderland can run any X11 application (any application that can run on Linux), and many Java applications, inside the immersive environment. Forterra and IBM integrate with IBM Lotus Sametime for enterprise instant messaging. Sun and VastPark provide a session initiation protocol (SIP) interface for

integration with SIP-compliant enterprise VoIP systems. ARI and Sun integrate with telephony systems so people in the environment can call those outside the environment via a phone number. Rivers Run Red provides a Web interface that enables text chat between those who are in the immersive environment and those who aren't.

Amphisocial and IBM provide the ability to import and export to and from spreadsheets into a form usable in the immersive environment (e.g., a brainstorming board). ProtonMedia integrates with Microsoft Office SharePoint Server 2007 and Amphisocial integrates with Google Apps — including automatically sending brainstorm participants a Google Spreadsheet containing the results. Teleplace provides what it calls “SmartRooms,” which automatically collate reports from multiple enterprise applications. Teleplace also provides user roles (e.g., meeting management tools for the meeting leader and baton handoff of meeting control from one user to another), collaborative document editing, direct access to RSS feeds, and the ability to webcast the video and audio of a session taking place in the environment to a web browser. ProtonMedia and VastPark provide blog and wiki tools. And Amphisocial (with the OpenSim version of its product), IBM, Linden Lab, ReactionGrid, Rivers Run Red, and Teleplace enable users to spontaneously co-create 3D content directly within the environment.

Large Meetings and Conferences Differ Primarily in Scale and Exhibit Hall Features

Large meetings have at least a couple dozen participants, more commonly a few hundred participants, and sometimes thousands. Hundreds to thousands of participants are in the same virtual place (e.g., ballroom or amphitheater) for at least part of the event (e.g., a keynote presentation).¹⁵ Examples might include a quarterly all-hands meeting or annual sales kickoff.

Attendees may break into smaller groups to attend training sessions or small presentation-style or collaborative meetings. Conferences consist of large meetings (typically keynote presentations or general sessions) plus small meetings (presentation style and/or collaboration style meetings, sometimes held in simultaneous tracks) plus an exhibit hall or poster session area and a networking area for attendees. The number of attendees at conferences can range from hundreds all the way up to tens of thousands.

Large meeting and conferences

ARI, Avaya, Linden Lab, and VastPark can handle several hundred users in a single space. InXpo, ON24, and Unisfair can handle thousands.

For large meetings and conferences:

- **Large meetings have similar requirements to small meetings — but for more people.** Productivity in large meetings requires little more than audio (so attendees can hear the presentation), text chat, presentation tools (e.g., for slide shows or video streams), and some means of guiding participants' attention (such as a laser pointer or camera zoom function). The ability to specify user roles and privileges is a boon for keeping things organized and flowing smoothly. InXpo, ON24, and Unisfair can support large meetings with pseudo-3D environments. Vendors that can deliver large-scale meetings in full 3D, with several hundred participants in a single virtual space (e.g., attending a keynote speech), include ARI, Avaya, Linden Lab, and VastPark. Other vendors, like Forterra and Rivers Run Red, can scale to several hundred avatars

¹⁵ Some vendors compensate for a lack of scalability by splitting attendees up into smaller groups and putting them in separate, isolated spaces where they can view the keynote presentation on a screen.

in a single place with special tuning (customization) of their software. Linden Lab's ecosystem includes third party providers like Virtualis, which deliver turnkey conference and large event management services in Second Life.

- **Conferences require massive scale and some additional features.** InXpo, ON24, and Unisfair stand apart from the pack in sheer scalability, as well as exhibit hall capacity and marketing-oriented metrics for lead generation. Because these pseudo-3D environments don't require the computing resources of full 3D environments, they can scale to support tens of thousands of simultaneous attendees. Technically, 20,000 or more attendees at a conference held in a pseudo-3D environment from InXpo, ON24, or Unisfair, can simultaneously view a live or recorded keynote speech via video, engage in a massive text chat during the speech, and ask questions of the speaker via text during Q&A. In practice, only a subset of conference attendees (perhaps 15% to 25%) tends to be in the same virtual space at the same time (e.g., watching the keynote speech and maybe participating in a text chat during the presentation). The conferences use case has emphasis on social networking tools because in many cases, attendees won't know each other, or may not work for the same organization. InXpo, ON24, and Unisfair provide integration with external social networking tools like LinkedIn and Twitter.
- **Vendors differentiate with event volume, data model, language support, and pricing model.** In 2009, InXpo delivered more than ~~1,000~~ 500 and ON24 delivered more than 300 virtual events. Unisfair has a three-tier data model, which allows for shared resources, content, and reporting across venues and events. Large meetings and conferences may have attendees from around the world, so support for multiple languages is important. Linden Lab makes its user interface (UI) available in 15 languages. InXpo and Unisfair provide their UIs in 9 and 16 languages, respectively. InXpo and ON24 can deliver event content (e.g., presentation materials or marketing collateral) in the user's desired language, as long as the content has been translated into that language, and Unisfair provides live real-time chat translation for 50 languages. InXpo, ON24, and Unisfair deliver full-service virtual events on a per-event basis. Event pricing can range from \$50k-\$60K USD to several hundred thousand dollars. Unisfair also offers subscription pricing for always-on, 365 days/year environments.

Classroom-Style Training Is Similar to the Small-Meeting Use Case

This use case is similar to meetings, except that training sessions are designed to meet specific learning objectives, while meetings may be exploratory, unstructured, or agenda-oriented. Students and trainers gather in a virtual classroom, where trainers share information and presentation materials while learners listen, ask questions, and interact with each other. The space may look like a traditional classroom, or may be created to look like a laboratory, control room, board room, or anything else. Learners may be quizzed at the end of the session, either within or outside the immersive environment. Test results may be filed away automatically via integration with an LMS.

Classroom-style training

Small-meeting solutions can be used for classroom-style learning. For learning-specific functionality look to ARI, Forterra, ProtonMedia, ReactionGrid, Sun, and Teleplace.

For classroom-style training:

- **Base functionality is similar to that of small meetings, with the addition of learning features.** Almost all vendors that serve the presentation-style meetings use case can address classroom-style learning. Some vendors provide additional features that support learning, such as integration with LMSs, session recording for after-action analysis, and support for the SCORM specification. ARI, Forterra, and ProtonMedia provide SCORM support and frequently integrate their software with customers' LMSs. Avaya does not support SCORM but has integrated with a customer's LMS. Forterra, Sun Microsystems, Teleplace, and VastPark provide session recording and playback. While Linden Lab doesn't provide learning-specific functionality on its own, the company's ecosystem includes providers of learning-specific tools and SCORM-compliant applications.
- **Vendors with a history in eLearning or a specific focus on learning really shine.** ARI and ProtonMedia have a long history in eLearning and extensive experience in classroom-style training. ProtonMedia was founded in 1999 and ARI was founded in 2002, both as custom eLearning vendors. ARI stands out from the pack with its training analysis services and custom eLearning content creation services. ReactionGrid's entire public virtual world is focused exclusively on business and education.

Simple Simulations Emulate Hands-On Learning

Simple, hands-on style learning simulations typically involve one to a dozen or more participants, though may include many more for such activities as emergency preparedness training. Examples of simple simulations include sales and support training, communication skills-building, leadership training, negotiation training, and some forms of operational training. The immersive environment may be customized to look and behave like the physical environment in which the learner works, or will work, or may be designed to achieve specific results. For example, groups might climb a virtual mountain together, helping each other through narrow passes or difficult ropes courses, to brush up on their teamwork skills.

Simple simulation

ARI and Forterra specialize in simulation. Platform-and-toolkit vendors like IBM, Linden Lab, ReactionGrid, Sun, and VastPark provide the framework for building custom simulations.

For simple, hands-on learning simulations, feature requirements differ from meetings, conferences, and classroom-style training. The environment is interactive. When the learner comes in close proximity to, or clicks on, an interactive object, an event is triggered. A door might open, a gas can might ignite, or the correct answer on a board might light up and make a jingling sound. Simple simulations may involve user roles (e.g., student vs. teacher, manager vs. employee, operator vs. technician), support for artificial intelligence (or "bots") so learners can practice their interpersonal interactions, a physics engine to simulate gravity and collisions, and a scripting language for creating interactive scenes and objects. ARI and Forterra support features like these and specialize in simple simulations. Customers can build their own simple simulations using platforms from IBM, Linden Lab, ReactionGrid, Sun, and VastPark. Vendors like Amphisocial, Avaya, Teleplace, and Virtual Italian Parks have built custom simple learning simulations for their customers.

Filter Your Options Based on Important Limiters

With nearly two dozen vendors in this market, and more emerging every quarter, combining use case requirements with limiters can help whittle down your vendor list. This next step in the technology selection process filters out products that don't meet your needs.

Common questions to unveil the limiters include:

- **What are your organization's security concerns?** One of the most common limits is security, which can be derived from corporate policy, compliance requirements, and/or government regulations. Mark Oehlert, innovation evangelist at Defense Acquisition University, said, "The main thing that sold our leadership on the vendor we selected is that the vendor had already been vetted against Department of Defense requirements, such as security." If you require secure data or isolation from other systems, consider solutions that run behind the firewall. A World for Us, Altadyn, Amphisocial, ARI, Avaya, Forterra, IBM, Linden Lab, ProtonMedia, ReactionGrid, Rivers Run Red, Sun Microsystems, Teleplace, VastPark, and Virtual Italian Parks all offer software that can run behind the firewall. Other important security considerations include data encryption and integration with the enterprise directory.
- **With which systems must the software integrate?** Directory integration is important for security, for authentication and single sign on. Vendors that provide lightweight directory access protocol (LDAP) integration include Altadyn, Avaya, IBM, Forterra, Linden Lab (with Second Life Enterprise), ReactionGrid (with Harmony), Sun Microsystems, and Virtual Italian Parks. ProtonMedia and Teleplace integrate with Microsoft Active Directory. Another common integration point is office productivity software. A World for Us, Amphisocial, Avaya, Forterra Systems, ProtonMedia, Rivers Run Red, Sun Microsystems, and Teleplace allow users to upload or drag and drop Microsoft Office, OpenOffice.org, Google documents and spreadsheets, or other types of files into the environment. ARI, Forterra Systems, and ProtonMedia commonly integrate with their customers' LMSs. Amphisocial, InXpo, ON24, Unisfair, and VastPark provide integration with external social networking tools, like LinkedIn and Twitter.
- **How many users does the system have to support?** Scalability is an important limiting factor — particularly the maximum number and average number of people you will need to bring together in the same place at the same time (e.g., presentation hall or amphitheater). Most 3D environments support 60-100 users in a single space. For some vendors, the recommended average is lower than this (e.g., Amphisocial, Forterra, IBM, ReactionGrid, and Sun Microsystems, where it is in the 20-50 range). Several 3D vendors can support multiple hundreds of users in a single space (ARI, Avaya, and VastPark) without special tuning of their software. The pseudo-3D virtual event platform vendors (InXpo, ON24, and Unisfair) offer orders of magnitude greater scale: tens of thousands of users in the same virtual space.

- **Do your target users have the necessary technical pre-requisites?** An array of software, hardware, and network bandwidth issues can crop up.¹⁶ Users can experience severe performance degradation due to their computers' limitations or network access problems. Objects and textures may not appear on the screen as expected, or voice or media services may not work properly. Caroline Avey, learning strategist at ACS Learning Services, said, "Can you even get it installed and get the user into the environment? Some of the richly immersive environments may require too much bandwidth or the users' machines might not be adequate." Teleplace offers a peer-to-peer solution that optimizes network usage and can be used in relatively low-bandwidth environments. Avaya web.alive has optimized its voice functionality so users can have a good experience even if they don't have a headset. Some vendors offer Web-based solutions, which minimize requirements for powerful graphics cards and computer processors — these include A World for Us, Altadyn, Avaya, InXpo, ON24, Unisfair, and VenueGen.
- **Will the software enable you to leverage your existing technology skill sets?** This is particularly important when evaluating platform-and-toolkit offerings, versus packaged applications. Charlie Herbek, senior IT manager with CSC, said, "We had good subject matter experts on board. When we were making our technology decision, we were influenced by the skill sets they had. I have one guy on my team who is an outstanding Second Life builder and scripter." Nina Nussbaum-Jones, a senior engineer at Lockheed Martin, said, "As Java programmers, my team loves the fact that Sun Project Wonderland provides an application programming interface (API) that doesn't require reading mounds and mounds of information." Amphisocial, IBM, ReactionGrid, and Rivers Run Red — and, of course, Linden Lab — all offer products built on OpenSim or Second Life, which utilize the same scripting and building tools. Altadyn is written in Java, and Amphisocial and Sun Microsystems offer technology built on Sun Project Wonderland, which is Java-based. VastPark offers a platform built on the Microsoft stack. Avaya customers can do some web.alive scripting with Javascript; more complex development is done using the Unreal engine. Teleplace provides a Python scripting language API.
- **What is your budget?** Diverse pricing models make it difficult to compare the cost of one solution against another. Some vendors charge per-user, per-hour. Others charge based on number of concurrent or named users. Defining your expected usage patterns is critical to finding a cost-effective solution. Open source software like OpenSim, Sun Project Wonderland, and VastPark are free, if you don't include the cost of building and maintaining applications. Keep in mind that per-named user models are not particularly conducive to experimentation — departments may be hesitant to pay for licenses for users who may enter the environment just once or twice. If you are hosting one-time events (e.g., meetings, presentations, or conferences), a per-user, per-hour model, or a per-event model, can work well. Factor in the total cost to get deployments up and running. Be sure to fast-forward 2, 3, and 4 years ahead. Some vendors

¹⁶ Early adopters have found springboards for overcoming technical barriers to adoption. These include selecting Web-based software; integrating with telephony, Web-based text chat, and enterprise instant messaging to support users who can't get into the immersive environment; and even purchasing low-cost computers for critical target users. For more insights, see the September 23, 2009 ThinkBalm report, [Crossing the Chasm, One Implementation at a Time](#).

(e.g., Forterra Systems, Linden Lab, ProtonMedia, and Teleplace) currently charge a recurring annual license fee that is higher than the standard 20% to 25% enterprise software maintenance fee even if you run their software in your own data center. As the market evolves, we expect vendor pricing strategies to mature, as well.

- **What level of support do you require?** Support is an important consideration for enterprise buyers. The vendors in this emerging software category differ widely in the support they offer customers. Most vendors provide customer support via email, chat, and/or voice during normal business hours. Some vendors support customers directly; others have channel partners. At one end of the spectrum are open source projects like Sun Project Wonderland — Sun does not provide support for Wonderland customers; formal support is available only through third parties. Informal support is available via the Wonderland open source community. At the other end of the spectrum are vendors that not only offer their own full-service solution, but also provide support service through channel partners. For example, ProtonMedia provides business-hour support directly; customers can obtain 24x7 support through IBM Global Business Services contracts. ARI has a staffed customer support desk, makes concierge service available within the PowerU environment, and provides 24x7 technical support. InXpo, ON24, and Unisfair provide voice, text chat, and email support during their customers' events. Linden Lab, ReactionGrid, and Teleplace provide remote server administration. Linden Lab has service providers in its ecosystem that can provide additional support for enterprise customers.

RECOMMENDATIONS

Our research leads to the following recommendations:

- **Build a list of use case-based requirements and rank their importance.** The nearly two dozen products available today differ widely from one another due to the vendor's history, design decisions, technology choices, and target use cases. Use this report as a launch point for coming up with your own requirements list. A clear understanding of limiters can scratch vendors from the running, thereby simplifying the selection process. Keep in mind that some requirements are only obvious after the project team has gotten hands-on experience with immersive software.
- **Scan the full vendor landscape before making a decision.** After you have made headway documenting requirements, spend time looking at vendor Web sites and watching vendors' short videos. This will give you insight into the possibilities and opportunities, as well as limitations shared by all the vendors in this emerging market. Immersive software is advancing quickly, with rapid gains in scalability, utility, and stability. The market is changing quickly, with vendors entering and exiting at a rapid pace. Look at all your options — a vendor you have heard of through a colleague or in the press may not necessarily be the best choice for your particular situation.
- **Take a use case-based, portfolio approach and select one or two preferred vendors.** Don't expect a single product to meet all your organization's needs. Take a portfolio approach to meetings, conferences, and learning and training and select one or two preferred vendors. Fill in gaps with specialists who can meet needs for large-scale conference events, low-bandwidth user populations, or complex, sophisticated simulations. Keep your options open and refrain from long-term contracts, unless your organization sees a strategic alignment opportunity with a vendor. IT professional Charles O'Connell offers this advice: "Be guarded about rushing toward a single choice for all uses. It's a fear: a rush to choose a single product, and make massive commitment. That would be a huge mistake."

Charlie Herbek, senior IT manager with CSC, said, "We use a couple of different immersive environments. It is not an issue of one or the other." Kelly Graham, manager of the virtual event strategy and shared services group at Cisco Systems, said, "Our team does nothing but virtual events. We keep a portfolio of technologies and use the best one for the job." Rob Halsey, VP of marketing innovation at SAP, said, "Put the process and personnel in place to run a virtual experience, and then you can use the technology that best meets your business needs."

- **Look for reuse opportunities.** Concentrate on each use case separately, initially, to thoroughly understand requirements. But keep an eye open for multiple opportunities. Nina Nussbaum-Jones, senior engineer with Lockheed Martin, said, "We need a product that can do more than just support meetings. It has to support multiple use cases." Caroline Avey, learning strategist with ACS Learning Services, said, "Once you've purchased or built something, it becomes about, 'What else can we do with it?' You might start off using just some of the features and functionality. Over time you use more." Charles Herbek, senior IT manager at CSC, said, "We initially purchased our Second Life island for marketing, to celebrate the company's 50th

anniversary. But our intention is to move on to meetings, learning, onboarding, and induction of new employees. We are now repurposing the island for our chief learning officer.”

- **Prepare for market churn in 2010.** All the vendors are small. Avaya, IBM, and Sun Microsystems are impressive names, but their immersive software project teams are no bigger than those of the small vendors in this space. Many vendors are actively seeking outside funding. Not all will receive the investment they require to continue operations. Additional vendors will enter the market. Product lifecycle management software vendors are keeping an eye on this emerging market, as are unified communications vendors, which may see an immersion layer as a new way to achieve unification of services. We expect 2010 to be a busy year, with new entrants, mergers and acquisitions, and even some business closures.
- **Turn to service providers and system integrators for turnkey solutions.** This report is focused on the enterprise immersive software vendors and their products. An important portion of the market, however, is served by third parties that resell immersive software and provide custom development and support. Accenture, CSC, IBM, Hewlett-Packard, Lockheed Martin, Northrop Grumman, and SAIC are among the large system integrators (SIs) that have delivered custom immersive solutions to customers. The software vendors also often partner with smaller providers, which may provide less expensive options than the big SIs. As part of your due diligence effort, ask the vendors for a list of service providers they work with that focus on your specific industry, geographical region, or use case.
- **Get as much hands-on experience as possible before making a vendor choice.** Immersive environments are all about engagement, which comes from users having memorable experiences. It is hard to select an immersive technology without having had at least a taste of the kinds of experiences that are possible using this technology. Attend business-oriented events held in as many different immersive environments as you can.¹⁷ If time and resources allow, install or enter multiple immersive environments and test them for your target use case.
- **Check references carefully.** When evaluating vendors, look for proven expertise in your industry and familiarity with the kind of project you plan to undertake. Set up calls with all reference customers the vendor provides. Find out how well the software met expectations, and what the customer might do differently if they were to do it all over again. Via Twitter, LinkedIn, and other social networks, seek out conversations with additional organizations using the product, beyond the formal references the vendor provides. Before signing a sizeable deal with any vendor, meet with the management team for insights into financials and the product road map.

¹⁷ The ThinkBalm Innovation Community holds free events for members in many different immersive environments. For more information about the ThinkBalm Innovation Community, including a list of upcoming events, see this Web page: <http://www.thinkbalm.com/community/>.

METHODOLOGY

ThinkBalm analysts Erica Driver and Sam Driver developed this decision-making guide based on:

- **Interviews with Immersive Internet advocates and implementers.** We conducted fifteen interviews with early adopters who were involved in the technology selection process in their organizations during the past year or so. We spoke with people who work for [ACS Learning Services](#), [BP](#), [Cisco Systems](#), [CSC](#), [Defense Acquisition University](#), [Dell](#), [Federal Reserve Bank of New York](#), [Lockheed Martin](#), [Microsoft](#), [National Defense University](#), [Planview](#), [SAP](#), The Coaches Center, [UCSA International](#), and another that requested not to be named. For the names of the individuals we interviewed, see the Special Thanks section of this report.
- **Vendor briefings.** We conducted structured briefings with nineteen enterprise immersive software vendors: [A World for Us](#), [Altadyn](#), [American Research Institute, Inc. \(ARI\)](#), [Amphisocial](#), [Avaya](#), [Forterra Systems](#), [IBM](#), [InXpo](#), [Linden Lab](#), [ON24](#), [ProtonMedia](#), [ReactionGrid](#), [Rivers Run Red](#), [Sun Microsystems](#), [Teleplace](#), [Unisfair](#), [VastPark](#), [VenueGen](#), and [Virtual Italian Parks](#). In some cases, these briefings took place directly in the vendor's immersive environment.
- **Hands-on experience.** ThinkBalm analysts have hosted hundreds of brainstorming sessions, advisory consults, project planning meetings, training sessions, role-playing sessions, meet-and-greets, office hours, presentations, and tours in such immersive environments as Activeworlds, Altadyn 3DXplorer, Avaya web.alive, IBM Virtual Collaboration for Lotus Sametime, ReactionGrid, Second Life, and Teleplace. ThinkBalm analysts also have basic administrative and content creation experience with some of these technologies, for added perspective.
- **Interactions with clients and members of the ThinkBalm Innovation Community.** ThinkBalm analysts have gained significant insights into the technology selection process through interactions with our clients and members of the ThinkBalm Innovation Community. The mission of the ThinkBalm Innovation Community is to advance adoption of work-related use of the Immersive Internet, and since its launch in August of 2008 has evolved into a mix between a social network, collaborative laboratory, and guild. The community currently numbers more than 400 Immersive Internet advocates, implementers, explorers, and technology marketers.

ThinkBalm conducted all of the research and analysis for this study in-house. The interviews and briefings were conducted during the months of November and December, 2009.

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ABOUT THE AUTHORS

Erica Driver



Erica Driver is a co-founder and principal at ThinkBalm. She is a leading industry analyst and consultant with nearly 16 years of experience in the IT sector. She is quoted in mainstream and industry trade press including the *Boston Globe*, *The Wall Street Journal*, *The New York Times*, *CIO*, and *Computerworld*. Prior to co-founding ThinkBalm, Erica was a principal analyst at Forrester Research, where she launched the company's Web3D coverage as part of her enterprise collaboration research. She was also the co-conspirator behind Forrester's Information Workplace concepts and research. Prior to her tenure at Forrester, she was a Director at Giga Information Group (now part of Forrester) and an analyst at Hurwitz Group (now Hurwitz & Associates). She began her career in IT as a system administrator and Lotus Notes developer. Erica is a graduate of Harvard University.

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Sam Driver is a co-founder and principal at ThinkBalm. He is an inventor and entrepreneur whose take on the Immersive Internet is heavily influenced by science, game theory, and science fiction. At the University of Massachusetts Medical School, Sam was part of a team that discovered RNA interference (RNAi) which was awarded the 2006 Nobel Prize in Physiology and Medicine. He founded Qik Technology to develop intellectual property holdings in functional genomics and co-founded a small Rhode Island-based residential real estate investment partnership. He also founded and operates Evil Minions Games, an IP and product development company, and established and runs a regional gaming organization. He's also an instrument-rated private pilot. Sam earned his BS at Ohio Wesleyan University and a masters in genetics from the University of Massachusetts Medical School.

SPECIAL THANKS

Special thanks to the following Immersive Internet advocates and implementers who were interviewed by ThinkBalm analysts for this research: [Brian Ralphs](#), [Caroline Avey](#), Charles O'Connell, [Charlie Herbek](#), [Cherisa Burk](#), [Kelly Graham](#), [Kimberly Stone](#), [Laura P. Thomas](#), [Mark Oehlert](#), [Michelle Miakos](#), [Nina Nussbaum-Jones](#), [Paulette Robinson](#), [Peter Meli](#), [Rob Halsey](#), and [Zain Naboulsi](#). A huge shoutout to [Christopher Simpson](#) for editing this report.

ABOUT THE SPONSORS

This research study was funded by the following companies:

- **Linden Lab.** Linden Lab, founded in 1999 by Chairman of the Board Philip Rosedale and headquartered in San Francisco, develops revolutionary, immersive technologies that change the way people communicate, interact, learn and create. Privately held and profitable, Linden Lab is led by CEO Mark Kingdon, and has more than 350 employees spread across the U.S., Europe, and Asia. Developed and launched by Linden Lab (www.lindenlab.com) in 2003, Second Life (www.secondlife.com) is a leading 3D virtual world. It enables its users — known as Residents — to create content, interact with others, launch businesses, collaborate, and educate. With a thriving in-world economy that saw more than \$550 million USD transacted in 2009, and a broad user base that includes everyone from consumers and educators to medical researchers and large enterprises, Second Life has become one of the largest hubs of user-generated content in the world.
- **ProtonMedia, Inc.** ProtonMedia (www.protonmedia.com and blog.protonmedia.com) is a leading provider of virtual world technology for the enterprise, with a focus on life sciences. The company's flagship product, ProtoSphere®, is a secure, private virtual world environment for collaboration and learning. As a premier virtual world platform for the enterprise, ProtoSphere provides a suite of communication and social networking tools designed to overcome linear communications and create a more engaged, productive, and efficient organization.
- **Teleplace, Inc.** Teleplace (www.teleplace.com) creates application collaboration solutions to help enterprises manage data-intensive projects and operations across multiple locations. Teleplace is a secure virtual workspace that combines voice, video and chat communications with multi-application and document sharing, enabling more efficient workflows among distributed teams, suppliers, and customers. Teleplace provides application collaboration solutions to over one hundred Global 500 and mid-size customers, including leading firms in the semiconductor, financial, energy, consulting, IT, and manufacturing sectors.
- **Virtual Italian Parks.** Moondus® is an open, high-quality virtual reality platform developed by Virtual Italian Parks S.r.l. (www.moondus.com). Moondus integrates different communication channels in real time within an immersive 3D environment. Moondus® is used by corporate, education, healthcare, government and military industries. For training, learning and collaboration, Virtual Italian Parks S.r.l. has developed a collaborative solution: Places powered by Moondus.® Places is a secure environment for remote collaboration with an immersive and realistic 3D interface, live audio and smart collaboration and communication tools. Virtual Italian Parks S.r.l. has been awarded in 2009 with the “Red Herring 100 Europe 2009” and the “National Prize for Innovation.”

ABOUT THINKBALM

ThinkBalm is a boutique analyst firm focused on work-related use of the Immersive Internet. We provide research and advisory consulting for technology marketers and Immersive Internet advocates, implementers, and explorers. The company was established in June, 2008 and is headquartered in Rhode Island, USA.

- **Research area.** We cover work-related use of the Immersive Internet. This includes virtual worlds and campuses, immersive learning environments, virtual event platforms, and 3D collaboration tools. We cover use cases such as meetings and conferences, learning and training, business activity rehearsal, sales and marketing, collaborative prototyping, data visualization, human resources management, and remote system and facility operations.
- **ThinkBalm Innovation Community.** The mission of the ThinkBalm Innovation Community is to advance adoption of work-related use of the Immersive Internet. Since its launch in August of 2008, the community has evolved into a mix between a social network, collaborative laboratory, and guild. The community is made up of bright and passionate Immersive Internet advocates, practitioners, and technology providers. As of January, 2010 we have more than 400 members.

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