

Harnessing the Hive: How Online Games Drive Networked Innovation

INSIDE

NETWORKED INNOVATION	1
R&D Estuaries	4
<i>Valve slashes the half-life of innovation</i>	
<i>Harvesting the honey</i>	
Constructive Ecologies	11
<i>The Sims: Virtual Dollhouses, Real Profits</i>	
Group-to-Group Interaction	14
<i>Designing multi-scale social context</i>	
Persistence and Accretion	17
<i>Box: Blizzard</i>	
Resources & Contact Information	22
Calendar of High-Tech Events	23

Save the date! The 26th annual PC Forum will be held March 23 to 26 in Scottsdale, AZ. Look for your invitation next month.

BY JC HERZ

Can open source work as a business model? The idea is that users contribute to the development of a shared body of code, doing so not for money, but for pleasure, recognition from peers, a sense of mastery. . . . It sounds great, but it's not a common business model. Even programmers need to make a living; altruism sounds good, but. . . .

In fact, the model does work. . . not only among some earnest techies, but also among a broad, diverse, loosely connected community of game players who double as developers. As JC Herz describes lucidly below, they are motivated not by altruism, but by pleasure, recognition from peers, a sense of mastery. Their efforts produce genuine social benefit for the users/developers, complement game companies' work and add genuine economic benefit for those companies. . . in addition to paying a monthly subscription fee. Just as children used both to work and play on the farm, so do this generation's children work and play online. When they grow up, their skills and habits will persist.

There's probably no one better equipped to describe this world than JC, is the principal of Joystick Nation, a research and design practice that applies the principles of complex systems to the design of products, services, and brands. Her clients include multinational corporations, high-tech start-ups and military research organizations.

JC won't talk much about her work for the Department of Defense, but about how these ideas can apply to business applications. It's probably not a direct transposition, but the kinds of things that motivate people apply across cultures. While developers of a tax-deduction module for a payroll package are not likely to do their work for the

{ continued on page 2 }

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EDITOR-IN-CHIEF: Esther Dyson
(edyson@edventure.com)

PUBLISHER: Daphne Kis
(daphne@edventure.com)

CONTRIBUTING EDITOR: Kevin Werbach
(kevin@edventure.com)

SYSTEMS DIRECTOR: Scott Giering
(scott@edventure.com)

CIRCULATION MANAGER: Natasha Felshman
(natasha@edventure.com)

ASSISTANT EDITOR: Christina Koukkos
(christina@edventure.com)

CONSULTING EDITOR: Bill Kutik
(bill@kutik.com)

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sheer pleasure of it, user groups of these and all kinds of packages do exist and reinforce the value of the products. Users can support one another, share patches and fixes and enhancements, and add value to the original. What does the developer need to do? One, foster the community: Give it a place to congregate and collaborate. And it needs to build macros that make it easy to add functionality. An optimist would point to Web services. . .and indeed they provide some of the technical platform that will make it easy for third parties to add modules. But developers should think a little about creating an appropriate cultural platform, too. How can you encourage users to feel a sense of creative (not just financial) ownership?

- Esther Dyson

According to 20th-century entrepreneurial mythology, great ideas come, like divine providence, to those few special individuals who, by dint of extreme brilliance or business savvy, qualify as a distinct sub-species of Homo sapiens – Homo innovatus, as it were. Their creed is “Eureka!” And lo, they do burrow into garages, or bunker down in Stanford dorm rooms, or show up to work in black collarless shirts and tinted eyeglasses. Great companies are founded upon their genius. And when those companies grow large and bureaucratic, the Innovators do cluster in brightly colored playpens called R&D departments, where the Creative People are allowed to live, and vast coils of CAT-5 cable are run from their brain cavities into Product Development, Marketing and Strategy divisions, to irrigate the companies with precious new ideas.

The products of Homo innovatus are then received by grateful consumers, who wonder how we ever got by in the absence of turn-key, fully-integrated, global solutions that spring fully formed from the foreheads of the anointed, whose heroic exploits are trumpeted in *Wired*, *Business Week*, and *The Red Herring*. The next generation of Homo innovatus rises to fulfill their destinies, and the chain of insanely great ideas continues. Amen.

Homo innovatus is a great story: It’s a hero story. We know how to hear it, and the media know how to tell it. VCs know how to fund it. The problem is that Homo innovatus doesn’t explain a lot of leading-edge innovation, nor does it account for the dynamics that

define a networked marketplace and the evolving relationship between companies and their customers in that marketplace. It does not account for the entrepreneurial-ly perverse ecology of open-source software or for the robustness of eBay. More importantly, it doesn't give credence to the collective intelligence of the network – the fact that a million people will always be smarter than 20 people, and that there is business value in that differential.

As the technological spotlight shifts to the edge of the network, and to increasingly decentralized models for software and services, there is a counter-myth of innovation. To paraphrase Scott McNealy, the Network is the Innovator. This is the church of open, modular, extensible, distributed platforms for all manner of commercial and leisure activities. The creed is “let a thousand flowers bloom, as long as they sprout in our garden.” In this paradigm, the innovative genius lies not in a creative singularity, but in the construction of systems that leverage the million monkeys theorem. The tide reverses, from one brilliant vision washing onto a million screens, to a situation where one shocked developer instant-messages his teammate, “You’ll never believe what they’re doing now – check this out.”

In 2002, the bleeding edge of massively networked innovation is computer games, a pocket of the software industry whose lurid aesthetics mask transformational advances in technology and business practice. For years, games have been driving consumer sales of computer hardware. Unless you're in a video production studio, scientific research lab, or a military installation, computer games are the most processor-intensive applications on a desktop computer. Ultimately, the only reason to upgrade a home computer is the ever-escalating CPU requirements of the latest computer games, which is why Intel and Nvidia court game developers so assiduously: Ratcheting up the minimum spec of a hit computer game goes directly to Dell's bottom line. While hardware companies consolidate, gamers' rabid appetite for computer performance has buoyed both build-it-yourself web sites such as Tom's Hardware and niche manufacturers such as Alienware, which has carved out a profitable niche just furnishing high-end custom PC's tricked out for the ultimate computer game experience – the Lamborghinis of desktop computing.

More recently, games have been driving broadband adoption. Students who played *Quake* on university LANs in 1996 are now young professionals with zero tolerance for dial-up. In Korea, which has the highest per-capita broadband penetration in the world, online games are the dominant force driving the country's appetite for bandwidth. Earlier this year, a player survey conducted by Valve, an entertainment software company, of a million combat gamers revealed that 75 percent of them had

upgraded from dial-up to broadband. But beyond hardware and connectivity, online games are the most highly leveraged kind of networked application – one that harnesses next-generation technology to basic patterns of human behavior: competition, collaboration, the tendency to cluster, and the universal appetite for peer acknowledgement. In other words, the forces that hone games, and gamers, have more to do with anthropology than with code. This kind of innovation is inextricably intertwined with the social ecology of the player population – the interpersonal conventions that define status, identity, and affiliation both within the games and in the virtual communities that surround them.

Unlike most technology products and platforms, an online game evolves in massive parallel between a company and its market. Profit is directly proportional to the community’s sense that it owns the experience, and to the interaction among groups, rather than to the fabled “one-to-one” relationship between producer and consumer. To that degree, online games are a useful lens for the next generation of networked software designers and the people who bet money on them. Through this lens, four lessons about massively multiplayer innovation pull into focus:

- R&D estuaries: leveraging community-driven design
- Constructive ecologies: artifacts & social currency
- Beyond collaboration: group-to-group interaction
- Persistence and accretion

R&D Estuaries: Leveraging Community-Driven Design

The development cycle for a computer game, circa 2001, is 18 months, from the generation of the design specification to the release of the product. (Production typically involves 12 to 20 people, with costs ranging from \$5 to 7 million, or double both factors for a persistent online world) But for many games, and particularly the stronger-selling PC titles, that process begins before the “official” development period and extends afterwards, with a continuous stream of two-way feedback between the developers and players.

Perhaps the most extreme example of front-loaded game design is the forthcoming multiplayer online world based on Star Wars, which is being built by Verant, the leading developer in this genre, and LucasArts. Verant’s last online fantasy role-playing game, *Everquest*, has 440,000 subscribers paying \$12.95 per month to live in a

medieval fantasy world. Hosting 100,000 simultaneous players during prime time, *Everquest's* server array requires a dedicated AT&T switching facility; *Star Wars Galaxies*, set to launch in late 2002 or early 2003, is expected by those in the industry to attract more than a million players. The virtual environment is massive – it will take weeks or months to traverse without “hyperspace” shortcuts – and will support a full-fledged economic and political system. Players will develop their characters by scaling a number of intersecting skill trees (engine mechanics, armor production, combat, knowledge in the Ways of the Force, etc.). As a design and engineering challenge, *Star Wars Galaxies* rivals the construction of a space station in sheer scale and complexity.

But even as the basic technology is built and the game mechanics are a mere glimmer in the developer's eye, players are a vital part of the design process. As soon as the development deal was signed, Verant set up a message board (SEE RESOURCES), both to communicate news about the game in progress and to solicit feedback from a hardcore player population with over 11 million man-hours of collective experience with games in this genre.¹

In a virtual environment as complex as a massively multiplayer online world (MMP), whose success depends entirely on player interaction, developers recognize the player base as a strategic asset. The dynamics of these games are rapidly evolving, and many of the parameters have yet to be defined. When in doubt, designers turn to message boards to tap players' perspectives on the pros and cons of specific features and aspects of game play that could be improved. These are, after all, the people who will inhabit this virtual environment on a week-to-week basis when the product is launched, and who will determine its success.

To a large extent, the players co-create the environment once the game launches; their satisfaction with the game hinges on their interactions with each other. They collectively author the human dynamics of the world, and the player-created objects within it – and they can leave if it doesn't suit them. The experience belongs to the players as much as to the developer. So it's in the developers' interest to keep players in the loop as the game takes shape and to leverage their experience. This is not just a marketing ploy (“Make them feel valued and they'll evangelize the product to their

VERANT INTERACTIVE INFO
Headquarters: San Diego, CA
Founded: January 1999; acquired by Sony Online Entertainment in May 2000
Employees: 480 (all of Sony Online Ent.)
Key metric: 440,000 <i>Everquest</i> subscribers pay \$12.95 per month
URL: www.soe.sony.com

¹ This is a conservative estimate: *Ultima Online*, Electronic Arts' massively multiplayer persistent world, was launched in 1997, and its average monthly usage per player is 85 hours (yes, that is *average*). If you define “hardcore” as the most dedicated 1 percent of the game's 225,000 subscribers, who have been playing since UO launched, that's over 11 million man-hours.

friends”), although it does also generate good will. It is part of the core design process on the bleeding edge of networked simulation.

Within existing technologies in well-established genres, the player base is even more actively involved in the design and evolution of computer games. “We put a lot of time and attention into making sure that there were clear and easy hooks for the fans who wanted to be involved in programming work to be able to add and integrate their own work into the game system,” says Ray Muzyka, founder and co-CEO of Bioware, a Canadian game developer whose Dungeons & Dragons-inspired *Neverwinter Nights* gives players an unprecedented level of access to the underlying architecture of a fantasy role-playing game. “There’s a very modular structure, where you can be a little bit involved in making things, or you can be really involved. Your own technical understanding can either take you into the depths of the code base or you can be very high-level, if you want to just use the easy-to-use *Neverwinter* tool set.”

First-person shooters (FPS) were the first genre to exploit the creative energy of the player base, starting with *Doom* (1993), which was released on the Internet before its commercial debut, and whose tool kit encouraged a legion of college students to make their own levels and download other people’s (remember ftp?). A few years (and a couple of sequels) later, id Software released the game’s source code, endowing the creative commons with its first hulking beast of testosterone-soaked C++.

Doom’s successors, such as *Quake 3 Arena* and *Unreal Tournament* are built on engines that have evolved for years, passed between programming teams and a population of gamers that customizes and often improves the game, just as its sequel is being planned. Player innovations are thus incorporated into the next iteration of the product. A salient example of this phenomenon is in-game artificial intelligence, one of the great engineering hurdles in any game. In first-person shooters, there is a marked difference between real and computer-generated opponents: Human opponents are invariably smarter, less predictable, and more challenging to play against.

AI, however, like all engineering challenges, can be a beneficiary of the million-monkeys syndrome: Put a million gamers into a room with an open, extensible game engine, and sooner or later, one of them will come up with the first-person shooter equivalent of Hamlet. In the case of Id Software’s *Quake II*, it was a plug-in called the ReaperBot, a fiendishly clever and intelligent AI opponent written by a die-hard gamer named Steven Polge (who was subsequently employed by Id’s main rival, Epic Games, to write AI for Epic’s *Unreal* engine). Polge’s Reaperbot was far-and-away the

best *Quake* opponent anyone (inside or outside id Software) had ever seen, and the plug-in rapidly disseminated within the million-strong player population, who quickly began hacking away at its bugs. Needless to say, these improvements in game AI were incorporated into the core technology of first-person shooters, a benefit to players and developers alike.

The point here is not that *Quake* has great AI, but how that AI came to be. *Quake*'s architecture, the very nature of the product, enables distributed innovation to happen outside the developer's walls. In essence, the player population is transformed from mere consumers into active, vested participants in the development and evolution of the game. Of course, not all players roll up their sleeves and write plug-ins. But even if only 1 percent contributes to the innovation in the product, even if they are making only minor, incremental improvements or subtle tweaks, that's 10,000 (unpaid) people in research and development.

Valve slashes the half-life of innovation

In business terms, massively multiplayer innovation blurs the boundary between producer and consumer, between the company and its market. At the vanguard of this phenomenon stand companies such as Maxis (a subsidiary of Electronic Arts) and Valve (a Kirkland, WA-based game company), whose commercial success largely depends on the collective design intelligence of their player communities.

Half-Life, Valve's flagship first-person shooter PC game, was subjected to "hive attack" by beta testers. The end result has been called the greatest PC game of all time. But according to Mark Laidlaw, Valve's lead designer, *Half-Life*'s flawlessness "was a result of hundreds of hours of playtesting, and forcing ourselves to respond to every bit of feedback and criticism that came out of the playtesting sessions, and working it back into the game and then playtesting those areas over and over again. . . I don't think testing can be overstressed." (SEE RESOURCES FOR A URL FOR THIS INTERVIEW)

Beyond play-testing products to within an inch of their lives, Valve's modus operandi, and its business model, is vitally dependent on the developers' ability to leverage the *Half-Life* "MOD" (short for "modification") community – players who use the game's power design tools to design new versions of *Half-Life* and distribute them on the Internet. Almost immediately after the game's commercial release, players began to re-engineer the game. Valve, in turn, began hosting MOD expos at Sony's Metreon – a San Francisco that caters to gamers and other pop-culture enthusiasts.

From this primordial pool of amateur MODs emerged a few masterpieces that arguably surpassed the original game. The first to surface was *Counter-Strike*, which converted *Half-Life*'s every-man-for-himself multiplayer death match into a squad-based combat game that cast players as members of either a terrorist or counter-terrorist team, each with unique weapons and capabilities. The game is played in a variety of maps/scenarios with varying objectives, including hostage rescue, assassinations, terrorist escapes, bomb defusing missions, etc.

Originally envisioned by a player in Vancouver, BC, Minh "Gooseman" Le, *Counter-Strike* was, like all MODs, a labor of love. "My initial motivation was probably the same as anyone else involved in the MOD scene," he explained on one of the many MOD fan sites. "I just wanted to customize the game to fit my vision of what a game should be. First and foremost, it is MY vision. . .not anyone else's. I don't spend 10+ hours a week working on a MOD for free just to make a MOD that satisfies everyone, I make a MOD that I am happy with and if someone else happens to like it, then that's a bonus." (SEE RESOURCES FOR URL TO THIS INTERVIEW)

When it turned out that lots of people did, in fact, like it, very very much, Le pulled together a team of fellow players happy to contribute time and energy to soup up the hottest MOD on the Net. His first recruit and project co-leader lives in

Blacksburg, Virginia. CS mapmakers hail from England (one was studying geography at Cambridge University), Germany, South Africa, New Jersey, Colorado, and Irvine, California.

VALVE INFO
Headquarters: Kirkland, WA
Founded: 1996
Employees: 50
Key metric: Two <i>Half-Life</i> MODs have made it to retail: <i>Counter-Strike</i> (1.3 million units sold) and <i>Gunman Chronicles</i> (500,000 units sold)
URL: www.valvesoftware.com

Up to this point, the *Counter-Strike* story is similar to many open-source development sagas: There is a lot of congruence between gamers and open-source coders, with the former applying their talents to entertainment experiences rather than server protocols or operating systems. But there are also a couple of critical differences. One is that, unlike most open-source software communities, where "forking" (the proliferation of different versions) is a real concern, the MOD community thrives on its ability to introduce the maxi-

imum number of mutations in parallel, with little concern about whether those mutations inter-operate. There's a lot more speciation. And because this sort of modular proliferation is built into the evolutionary process, the time overhead of project management is radically reduced. Cats are difficult to herd, but they breed like crazy just fine on their own.

Harvesting the honey

The second difference, from a business perspective, lies in a game company's ability not only to cultivate this elite unpaid R&D community, but also to capture the best mutations of its product for direct commercial gain and *not* alienate the player community by doing so. "That's a challenge for us," says Valve ceo Gabe Newell. "These teams get formed in funny ways. It's not like they're setting out to do anything like this, and so ownership and people's roles can be kind of vague."

"Sometimes you just have to give them advice," he says. "They ask questions like, 'Should we get a lawyer?' And you say, 'YES, you should have a lawyer'. Or, 'Should we incorporate?' Well, it depends on where you are. A lot of times these are multi-national groups; people working in different countries with different legal issues and taxation issues. So a lot of times we just try to help them understand what's going on. I mean, for us it's a really long-term investment, because it's a very social community. What goes around comes around. Everything you do follows you for a long time. So we try really hard to be helpful to these people. Within the *Half-Life* community, everything we do is very visible. We try to be very careful that everyone in the *Half-Life* forums isn't going to suddenly turn on us and savage us for something that we do."

Valve not only has a dedicated team to cultivate the MOD community, but it also underwrites the most promising MODs, which have significantly extended the life of the core product. In the wake of *Counter-Strike's* success, Valve started a "grants" program to fund the best MOD development teams. Beyond money, the company provided in-house development support – artists and coders – to hone *Counter-Strike* for retail. In 2000, Valve released a commercial version of *Counter-Strike*, packaged with other best-of-best MODs, as a retail product that succeeded despite the fact that *Counter-Strike* was still available on the Internet. "If you look at the time since *Counter-Strike* has come out, as an example of a product that came out of the MOD world," says Newell, "it's outsold every action game that shipped, and it's still a top seller for us, about 1.3 million units [to date]."

While the *Counter-Strike* team continued to operate in an independent fashion, Valve also managed to capture a MOD team in Australia whose *Quake* MOD, *Team Fortress*, was running on 40 percent of the *Quake* servers on the Internet in 1998. Valve hired the designers and brought the team in-house to develop *Team Fortress 2* as a new product. The value of this acquisition was two-fold. Not only would it fuel the *Half-Life* player base, but internally, it allowed Valve's coders to refine tools for the next wave of hot-MODders. Essentially, Valve hired MOD-makers to design

tools for MOD-makers, operating at the membrane between the company's core staff and its player-developers.

To that end, the team's first assignment was to create *Team Fortress Classic*, a *Half-Life* extension based on their *Quake* MOD, to be distributed for free on the Internet. From an external point of view, this was another piece of candy for the players. Internally, it was the extreme sports version of R&D: Make a MOD that causes you to test everything you would ever want to do when making a MOD, release it to the barracudas in the player community, and see if they rip it to shreds. (Among gamers, there is a thin line between love and hate.) *Team Fortress Classic* was the means to an end, namely better tools. Releasing the MOD for free wasn't a "loss leader" or a promotion; it was a display of best practices for hotshots in the MOD community. It was the most effective way to prime the MMP innovation engine.

For Newell, a member of the original Windows team who left Microsoft after 13 years to start Valve in 1996, games are an opportunity to redeem the PC user experience, and to reinvent the conventional relationship between a software company and its customers. "We recognize that every time we look at some aspect of our business, whether it's sales or marketing or support or operations, or design, if we don't think about how we can work in partnership with our customers and our fans, somebody else in the game industry will, and that'll hurt us until we've caught up," he says. "Will that start impacting software groups outside of the games business? I don't see why it wouldn't. I don't think there's anything special about the games industry that makes it any different than accounting software. It's just that we've had a couple products like *Counter-Strike* or *Everquest* that have made the benefits of doing it really obvious."

"Sometimes I have trouble," he says, "when I talk to people and say certain things about our business, and an MIS guy will say 'Oh, that'll never work. You can never let your user community get into your operations side.' And I go, look, this is not hypothetical. We have 28,000 servers with over 120,000 people playing simultaneously, 24 by 7. This is what is really happening in the game space. That boggles people's minds, that these have stopped being theoretical propositions and are actually occurring."

Constructive Ecologies: Artifacts & Social Currency

Most of the players who tinker with games aren't programmers. They don't have to be, because the editing and customization tools in today's games require no formal programming skill whatsoever. (Shades of high-level Web services.) Levels of combat games can be constructed in a couple of hours by anyone familiar with basic game play. Real-time strategy games offer similar capabilities. New maps, with custom constellations of opposing forces, can be generated with a graphical user interface. Objects, including custom avatars or "skins," can be constructed with photos wrapped around templates, sculpted with simplified 3D modeling tools, or bitmapped. Beyond the R&D dynamics discussed above, these crafting capabilities foster a constructive ecosystem around the making, enhancement and swapping of functional objects.

Unlike most online communities, games' constructive ecosystems are fueled by an innate human desire to make things, rather than talk about them. Consequently, the dynamics are radically different from the community interaction that occurs around text documents. Social currency accrues not to virtuoso talkers, but to people who make things that other people like to play with – Triumph of the Neato. Because the system runs on functional objects, rather than clever comments, there is greater real and perceived value in players' contributions. Downloading someone's level or map is more than a conversation. It's an acquisition. Similarly, player-creators are validated in a more meaningful way: People are using what they've made, not just agreeing with it. Use, not imitation, is the sincerest form of flattery.

***The Sims*: Virtual Dollhouses, Real Profits**

In a commercial context, this tool-based, user-driven activity has several important functions. It extends the life of the game, which both enhances the value of the product at no incremental cost and increases sales: The longer people play the game, the longer they talk about it — effectively marketing it to their friends and acquaintances. Will Wright, author of Maxis' best-selling *Sim City* series, compares the spread of a product in this fashion to a virus: "Double the contagious period," he says, "and the size of the epidemic goes up by an order of magnitude. If I can get people to play for twice as long, I sell ten times as many copies." Wright's formula bears out on the bottom line. His latest game, *The Sims*, has spawned four expansion packs (developed in response to the creations of its own R&D estuary of fans) and racked up nearly half a billion dollars in retail sales since its 2000 release.

The Sims, which scales Wright's Sim City down to the neighborhood level, is noteworthy because it illustrates the level of engagement a game can achieve when its designers incorporate crafting into the culture of the game. Four months before *The*

Sims shipped, its developers released tools that allowed players to create custom objects for the game's virtual environment: architecture, props, and custom characters. These tools were rapidly disseminated among *Sim City* players, who began creating custom content immediately. In the months leading up to the game's release, a network of player-run Web sites sprang up to showcase and exchange "handcrafted" *Sims* objects and custom characters.

MAXIS INFO
Headquarters: Walnut Creek, CA
Founded: 1987; acquired by Electronic Arts in June 1997
Employees: 200
Key Metric: 17 million units of <i>The Sims</i> and expansion packs sold worldwide.
URL: www.ea.com

By the time the game was released, there were 50 *Sims* fan sites, 40 artists pumping content into the pipeline, and 50,000 people collecting that content. One quarter million boxes flew off the shelves in the first week. A year later, there were dozens of people programming tools for *Sims* content creators, 150 independent content creators, half a million collectors, and millions of players reading 200 fan sites in 14 languages. While most of these sites are labors of love, a few are profitable as well.

At this point, more than 90 percent of *The Sims'* content is produced by the player population, which has achieved an overwhelming amount of collective expertise in all things *Sim*. The player population feeds on itself, in a completely bottom-up, distributed, self-organizing way; none of these people are on the Maxis payroll. So, if these people aren't being paid by game developers (in fact it's the reverse), why do they invest hundreds or thousands of hours whittling 3D models and maps?

Among hardcore gamers, there is an element of competition, and wanting to be noticed on a global scale. But for the casual gamers who furnish *The Sims'* virtual dollhouse, and for much of the level-swapping and map-making community, the practice of creating levels and skins and custom objects is a kind of 21st century folk art – a form of self-expression for the benefit of themselves and their immediate community. It sounds odd to put *StarCraft* maps and *Sims* dinettes in the same category as fiddle music and quilting, but socially they're congruent. Hence the appeal of sites like "Mall of the Sims," a showcase for items such as the following:

The Mermaid's Cave Rug Decorating Pack

Now you can turn your favorite floor tiles into area rugs...or bathmats, or welcome mats, throw rugs, or anything else you can dream up! Just place floor tiles as usual, in any size and shape desired, indoors or out.

Then place these colorful Rug Edgings around the outside, “pulling” away from the “rug” as you go. Brought to you by Hairfish of The Mermaid’s Cave, Store G16 (Level 2) here at MOTS.

Some people like to make virtual rug-edgings, and there’s a 125K craft tool that lets them do that – almost 4,000 downloads at last count. Unlike the R&D being done in the MOD community, this doesn’t have anything to do with making the most unprecedented kick-ass Formula One game experience that blows people away. It’s a form of social expression not unlike swapping MP3 playlists (mix tapes, in the previous generation) and recipes. Games, which are object-oriented at every level of the experience, provide a substrate for personal construction projects, which are all too rare in the current landscape of corporate capitalism.

In some sense, this mass-market digital crafts fair is an anthropological throwback. It’s more like scrimshaw than Web-surfing. And yet, if you look forward to a network where every object is live – the much-trumpeted world of Web services – that experience will be closer to *The Sims* than to the current generation of client-server browsers. *The Sims’* objects are not self-contained executable programs, but they’re not static data either. They function in prescribed ways, interact semi-autonomously, and exhibit behaviors within a dynamic framework. New objects contain behaviors that reconfigure the local environment. *The Sims* don’t know how to play soccer, for instance, but if a soccer ball (a software object containing all the rules for playing soccer) is dropped into their midst, they will form teams and start playing soccer. Player-created plug-ins and MODs intersect with game engines in a similar fashion.

There are two quantum leaps here. One is implementing a technology platform that allows this sort of evolutionary development to happen. The other is the idea that end-users, rather than professional coders, are equipped to design these objects, and that there is a social ecology that supports the making and trading of such objects among ordinary people. Amidst all the corporate prognostications about object-oriented code For The Rest of Us, it’s online games that furnish a tangible vision of that future.

And in fact, that future is already docking to the mainstream present. When *The Sims Online* launches as a subscription service in December, threads of the experience will be woven into the America Online interface for *Sims Online* subscribers, who will be able to use their AOL member profiles to generate Sim personas. Virtual cameras *Sims Online* will essentially turn the game world into a massively multiplayer cartoon reality program. “There are a number of ways we’re planning to link the

two worlds together,” says Matt Bromberg, general manager of AOL’s game division. “So if we wanted to have a concert with a Sim famous band inside the world of *The Sims*, only on AOL would you be able to peek into that world. In the technical sense, you’re not in *The Sims* through AOL, but it ought to feel that way to people. It’s a reflection, in general, of our overall programming strategy and business strategy in the game space.”

“The MMP game world is almost like a peek into what a next-generation online service could be,” he says. “In the online world, we’ve always had this personalization thing, and everybody has had various levels of success or failure with it. But these massively multiplayer games take that notion of personalization to a whole other level, which is not about this or that stock quote, but about the ability to arrange my world around me in a particular way. I think that’s a really interesting metaphor for how an online service could be built, particularly in a broadband context.”

Beyond Collaboration: Group-to-Group Interaction

In computer game culture, status is easily established, readily compared and (perhaps most importantly, for the core demographic) quantifiable. Every game ends with a winner and losers. Tournament players are ranked. Player-created content is not only reviewed, but downloaded and therefore measurably popular. The author of a game modification may have an internally driven sense of accomplishment, but he also knows that 18,431 people are playing his song; for a 19-year-old, that’s a big deal, particularly when fan sites start pointing to his home page. He gets a few laudatory e-mails from strangers. His friends think he’s cool and ask him for map-making advice. A level designer he’s never met, but whose work he admires, asks if he’d be interested in teaming up on a *Half-Life* MOD.

It is this web of relationships between players – competitive, cooperative, and collegial – that sustains the computer game industry, no less than the latest 3D engine, facial animation algorithm, or high-speed graphics card. Game code disseminates and thrives because it is an excellent substrate for human interaction, not because it is technologically impressive. Behind every successful computer game is a surge of interpersonal dynamics, both on an individual level and on a group level; games elicit and enable the most basic kinds of human pack behavior.

These group dynamics are best represented by the vast network of self-organized combat clans that vie for dominance on the Internet. No game company ever told players to form clans; they emerged in the mid-90's, and have persisted for years. There are thousands of them listed in Google's clan directory. The smallest have five members; the largest number in the hundreds and have developed their own politics, hierarchies, and systems of governance. They are essentially tribal: Each has a name, its own history, monikers, and signs of identification (logos and team graphics). Clans do occasionally cluster into trans-national organizations, assuming a shared identity across national boundaries and adopting a loose federalist structure. Generally, however, clans comprise players in the same country, because proximity reduces network lag – a real factor in games that require quick responses.

Although most clans revolve around first-person combat games, there are hundreds of clans vying against one another in real-time strategy games such as *Age of Empires*, *HomeWorld*, and *StarCraft* (*StarCraft* alone has 219 competing clans). Because strategy games are more tactically complex than squad-based combat, clans in this genre tend to maintain more elaborate Web sites that go into some detail about the clan's history, rules, chain of command, custom maps, and treaties with other clans. (Some clans even create password-protected areas for their allies to access strategic and diplomatic communication – the smoky back rooms of strategy gaming.)

The clan network may seem anarchic: It is fiercely competitive and has no centralized authority. But beneath the gruesome aesthetics and inter-mural bravado, it is a highly cooperative system that runs far more efficiently than any "official" organization of similar scale, because clans, and the players that comprise them, have a clear set of shared goals. Regardless of who wins or loses, they are mutually dependent on the shared spaces where gaming occurs, whether those spaces are maintained by gamers for gamers, like ClanBase, or owned and operated by game publishers, like Sony, Electronic Arts, or Blizzard Entertainment, the developer of hit games including *StarCraft*, *Warcraft*, and *Diablo II* (SEE BOX).

Designing multi-scale social context: small, medium, large, x-large

In online worlds such as *Everquest*, *Asheron's Call* or *Dark Age of Camelot*, the environment itself demands group formation. With dangerous monsters roaming around, a solo player doesn't last long in the wild; parties of four to six form in the interest of sheer survival, and ripen into war buddies as battles are fought and won. In addition, larger groups of players agglomerate into guilds ranging from a few dozen to upwards of a hundred affiliated characters.

Like clans in the combat and strategy genres, these groups are tribal. They have their own rites of passage and leadership structures. They form alliances with or declare wars on other guilds. There is even third-party software for the local chieftains of these organizations, who in the real world would be called managers. For \$20, GuildBoss furnishes “the *ultimate* guild and clan management utility for multiplayer games.” It’s integrated directly into Microsoft Outlook and ICQ, and helps a busy clan leader gauge the performance of all his elves, rogues, and warriors. For human resources management software (evaluation, promotion, presence awareness), you could do a lot worse.

Above and beyond their well-honed skills, players have group identities that keep them rooted in the environment, long after they’ve mastered the intricacies of game play. Hacking and slashing aside, online games construct a multi-layered social context that’s more structurally sophisticated than any “grown-up” online community. If solo Web-browsing is socially one-dimensional (an individual), and online discussion groups are two-dimensional (a circle), then massively multiplayer games are four-dimensional; the experience plays out on multiple scales: the individual player, small adventuring groups, tribal organizations like clans and guilds, the online world as a whole.

“In a game, you’re set up within natural factions,” says Bill Roper, vice president of Blizzard Entertainment’s San Mateo development studio (SEE BOX). “For example, in *World of Warcraft*, there are specific races like orcs and humans and dwarves. They all have their likes and dislikes, and that’s part of the game world. When we extend that into a massively multiplayer game, you have these built-in friendships and animosities in the way the game is designed, so you start naturally allying yourself along those lines. So now it becomes: How am I affected as an individual? How am I affected with the people I like to run around with? How does that then affect the larger group, like the clan of us, or the guild of us, which may be 30, 40, 50, 100 people? And then how does it affect all of my people – all of the orcs, or all of the humans? One thing that games offer that you don’t get elsewhere is that what you do has several layers of ramifications.”

“Many-to-many” is a common buzzword in technology circles. But usually, it really means one-to-one-to-one: I can interact with many people, and so can other individuals. There’s very little in the way of true group-to-group interaction. And yet this is one of the most compelling aspects of the online game experience – not me against you, but my team against your team, or my team playing something that your team built. The functional unit is not the individual; it’s the pack. Group cohesion keeps

players in the game, as in the real world: Clans, guilds, packs, teams, buddy lists, book clubs, the people you forward a joke to – that’s where the leverage is.

Collaboration is part of it, but that’s missing half the equation. Collaboration assumes that people interact across an inward-facing project circle. In contrast, games assume that groups face other groups. There is a lot of kinetic potential in that intersection. Perhaps it’s because most software is engineered in the West, where the individual is the prime unit, but the discourse around online identity allows only for personal identity, with little or no acknowledgement of group identity. Games encompass both kinds of identity, in player culture and in the applications themselves (i.e. character names reflect their social affiliations). That creates another, very meaningful layer of context that’s particularly resonant in non-Western cultures. It is not a coincidence that the capital of online games is not the United States or Europe, but Asia. As technology permeates the non-Western world, it would be useful to consider what applications might emerge from the more nuanced and complete set of social assumptions that are taken for granted in game design.

Persistence and Accretion

The business value of social context is especially important for companies such as Electronic Arts, Sony, and Microsoft, which maintain persistent multiplayer worlds that support hundreds of thousands of gamers on a subscription basis. Unlike most games, whose playing fields exist only while participants are actively engaged, multiplayer online worlds such as *Everquest*, *Ultima Online* or *Asheron’s Call* persist, whether or not any particular player is logged on at any given time. The virtual environment is not something that vanishes when you stop playing: There are forces (some internal, some resulting from other players’ actions) continuously at work. This persistence gives the game depth and is psychologically magnetic: The player is compelled to return habitually (even compulsively) to the environment, lest some new opportunity or crisis arise in his absence.

Compared to transient multiplayer environments (i.e. combat and strategy games), the experience is qualitatively different. The world is dynamic, and therefore less predictable. More importantly, the game extends over days, weeks or months.

The persistence of the environment allows players to develop their characters’ identities within these worlds, which all hew to the conventions of role-playing games

BLIZZARD: BUILDING SOCIAL INFRASTRUCTURE INTO THE BUSINESS MODEL

For Blizzard Entertainment, perhaps the game industry's most consistent hit-maker, social infrastructure is part of the business model. When a player buys a copy of *StarCraft*, *Diablo II*, or *Warcraft III*, he doesn't just get a string of ones and zeroes on a CD. He gets access to Battle.net, a huge multiplayer gaming platform Blizzard maintains for its customers at no additional hourly or monthly charge. Players simply select the Battle.net option from within the game, and are instantly connected to a worldwide network where they can chat, challenge opponents, initiate multiplayer games, download new maps, exchange ideas, strategies, and tactics with other gamers, and participate in online tournaments.

Compared to the code that drives the game itself, Battle.net isn't hugely sophisticated. What Battle.net does is invest players in the game by radically lowering the social transaction costs. If none of your friends own a copy of *Diablo II*, it doesn't matter. There are 11 million gamers on Battle.net ready to play with you, upwards of 100,000 of them at any given time. Not only does Battle.net provide a playpen at all hours of day or night, but it will also match you up against players with similar degrees of skill, and calculate your rank should you decide to participate in either low-level or high-level tournament ladders.

This social infrastructure is built into the experience by design, and is a huge factor in Blizzard's success. Blizzard actively nurtures Battle.net's ecosystem, not as a frill or afterthought or public service, but as an integral facet of corporate strategy. It is budgeted, staffed, maintained, patched, and extended, no less than the underlying game engine. Blizzard's products are computer games. But the social dynamics of a networked player population are the backbone of its business. Arguably, Battle.net - not the game code - is the company's most sustainable asset.

"The original *Diablo* was a great game that got a lot more exposure because of Battle.net," says Bill Roper, vp of Blizzard North, a Blizzard Entertainment development studio in San Mateo. "The attention that *Diablo* garnered, and how well it did, made it that much easier for people to be interested in *StarCraft*, because people already had that great experience playing over Battle.net. And then *StarCraft* helps feed *Diablo II*, and *Diablo II* helps feed *WarCraft III*. They all support each other. It really does work as a very long-term value-add for the player. They've got a place to go, it's free, they can play against anybody else who bought the game, they have a great time, we continue to support it. At the same time, we're keeping people

interested in our company and our products. And as long as we continue to do our best in delivering great games, those people are going to stick around, because they're playing a lot of Blizzard games all the time."

As a matching service for strategy gamers, Battle.net doesn't impose a huge amount of overhead. Blizzard does maintain *Diablo Realms* hosting servers for its role-playing game, *Diablo II* - two in the US, one in Europe, and three in Asia - but it's nowhere near as bandwidth-heavy as persistent worlds such as *Everquest*, which centrally host player sessions, instead of shunting them off into play groups that connect peer-to-peer. By contrast, when Blizzard's own persistent MMP, *World of Warcraft*, debuts next year, it will host player sessions, and charge a \$10 monthly fee like other massively multiplayer persistent worlds.

As an online game platform, *Diablo Realms* is sort of an amphibian technology. Neither a simple matching service nor a full-fledged persistent world, *Diablo Realms* games are transient, but the game characters in them are persistent. Which is to say, after you finish playing on *Realms*, the copy of the world you were playing in disappears, but all the rare items and experience points you accrued remain with your character, who can venture forth into *Realms* engagements with new strength and better loot. It's a testament to the power of persistence that, even though *Realms'* parallel worlds flash in and out of existence, players are selling rare *Diablo II* objects on eBay: Atma's Wail Embossed Plate Armor can be yours for \$5.99, payable by Visa, MasterCard, or American Express. If a kid in India could somehow get a PayPal account, he could probably earn more real-world money scavenging in *Diablo Realms* than in his home town.

"With *Diablo II*," says Roper, "so much of that game is about items. The entire game is built around randomness: The areas you go are random, the monsters that spawn there are random, the layout's going to be random, the items you find are random. So it's always a fresh experience every time you play the game. When players come on, even if they're at the top level in the game, they might find something different, something a little better, something they can trade for this other thing somebody has that they want. To be honest, it works a lot like a slot machine. You're playing because there's always the chance that maybe that next thing's going to come out, and it's going to be the thing you want that's better. You're pulling the handle."

(RPG). In an RPG, a player's progress is represented not by geographical movement (as in console adventure games such as *Mario Bros.* or *Tomb Raider*, where the object is to get from point A to point B, defeating enemies along the way), but by the development of his character, who earns experience points by overcoming in-game challenges. At certain milestone point-tallies, the character is promoted to a new experience level, gaining strength, skill, and access to new weapons and tactics – but also attracting more powerful enemies. The better the player becomes, the more challenging his opponents become. Thus, the player scales a well-constructed learning curve over several months as he builds his level-1 character into a highly skilled, fully equipped level-50 powerhouse. Not surprisingly, players are highly invested in the characters they have built up.

As in Slashdot's "karma" system or eBay's reputation ratings, "leveling up" is a big motivating factor for players: It's the game's way of validating their cumulative accomplishments with something quantifiable, if not tangible. It's not enough for players to amass knowledge and skill; they have to see it those characteristics manifest themselves in the physics of the game. The accretion of value in persistent worlds changes the psychology of leisure: You haven't "spent" 1,000 hours playing a game; you've "built up your character." You've made progress! Accretion transforms idle time into something that feels industrious. It turns spending into earning. You see the same psychological dynamics with frequent flyer miles – and the same sort of behavior. Travelers go to great lengths – sometimes thousands of unnecessary miles – to build their characters up from Blue to Silver or Gold Elite, in order to get double mileage and dedicated check-in and the mystical power of free confirmed upgrades.

Accretion elicits emotional investment. In the physical world, travelers cherish their stamp-filled passports, as well as their frequent flyer miles. Scouts have badges. Skateboarders and rock climbers proudly point to their scars; ballet dancers save their scuffed and worn toe shoes. But outside of games, there are very few online experiences that leave you with any sense of lasting value. You are only spending attention, not investing it. One reason the Web seems so rootless and superficial is the lack of accretion; there are very few mechanisms that render people's investment of time, attention, and emotional energy into persistent artifacts of quantifiable value.

Where those artifacts exist, they not only represent experiential value but are often parlayed into real-world financial value as well, as players monetize their time. The player accounts of high-level online game characters, which may be cultivated over years, sell for hundreds of dollars on eBay – itself a massively multiplayer game (like any market), and a role-playing game at that. Persistent world characters are, after

all, statistical profiles of a player's cumulative experience in the world. When it comes to interaction design, eBay and MMPs are siblings separated at birth – which is why they mesh so well.

Last year, Edward Castranova, an assistant professor of economics at California State University at Fullerton, calculated the real-world value of each unit of *Everquest's* currency, the platinum piece. Based on exchange rates between EQ platinum pieces and US dollars on eBay, he found that the value of the EQ currency was greater than the lira or the yen. Using the average players' rate of acquisition of platinum pieces in the game (i.e. the treasure they gain by slaying monsters), the hourly "wage" in *Everquest* is convertible to \$3.42. On an annual basis, an *Everquest* player's economic productivity – not the subscription fee he pays Sony, but what he "earns" as an errant adventurer, in convertible *Everquest* currency – falls somewhere between that of the average Russian and the average Bulgarian. If *Everquest* were a country, it would rank 77th in per capita GNP.

Of course, not all of this MMP-to-real-world arbitrage is strictly legal under the games' end-user licensing agreements, and most people create characters to use rather than to sell. But the thing that divides persistent worlds from other online games is this: They're a service, not a product, and if the administrators crack down too hard, or make themselves look like jerks, players will leave and take their \$12.95 a month with them. There's a recognition that if you allow people to build value in a persistent world, this sort of asset trading will occur on some level – *Ultima Online* has even started offering "buffed" characters as a premium service; for \$29.95, you can buy an advanced level wizard straight from the company store. Other services include the ability to change your character's name for \$29.99 (an implicit acknowledgement that characters are transferred to people who want to graft pre-established personas onto second-hand avatars). As long as players' activities aren't compromising the experience for others, MMP companies eventually let them wag the dog.

Beekeeper Beware

Lest this magical mystery tour convey the impression that online games are a sort of fusion physics devoid of liability, one should remember that not all massively multi-player innovation is positive. Gamers are notorious for exploiting every weakness that client software is heir to. If it can be hacked, they'll hack it, particularly if doing so conveys some in-game advantage (although they're not averse to reverse-engineering client software just for kicks). For example, the initial version of *Ultima*

Online put lighting control on the client. It seemed fairly innocuous to the designers...until players with hacked clients started illuminating the dungeons on their own screens, while other players stumbled around in the dark. Radically mismatched mayhem and slaughter ensued. *Diablo II* players are highly inventive when it comes to duping objects (which are then sold on the open market). When it comes to exploiting loopholes in a distributed system, gamers' creativity knows no bounds.

For technologists who are still in the business of selling products, not online-all-the-time services, the community management issues can be daunting. Not only do you have to contend with how end-users interact with your code – you have to contend with how they interact with one another. Naturally, players expect high levels of responsiveness from administrators, even as they try to game the system. Pundits throw around buzzwords like “swarming” as if it’s all upside. From the trenches, it can be a grueling experience: Ask a game designer who’s being swarmed by angry players when his online world’s economic system goes haywire shortly after launch. The amount of damage a group of malevolent or disgruntled players can do to a game’s commercial prospects is significant. They can ruin the in-game experience for new players, forcing them to flee. They can rally their guilds to leave the system, ripping the game’s social fabric apart on their way out. Positive feedback is a double-edged sword.

The great thing about these massively multiplayer systems is that players really care about them. The awful thing is that players really care about them. Keeping these social systems humming is as much an art as a science. The people harvesting honey have had their share of stings at some point. But then, biology is always messier than engineering – less pure, less predictable, but more productive. It takes a certain degree of humility to acknowledge the imprecision of social system design. As the designers of Lucasfilms’ *Habitat* observed in their early forays into online world design, “In the most carefully constructed experiment under the most carefully controlled conditions, the organism will do whatever it damn well pleases.”

The genius of online game design is that this open, organic condition is optimal, rather than disastrous. The loops are open. The universe is messy, and that’s a Good Thing. And high above the teeming population of players fighting, building, trading, and pushing back against the world they’ve been given, the authors of the game are watching, to see where players lead them. ■ R1.0

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- Grid Computing
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- And much more. . . (If you know of any good examples of the categories listed above, please let us know.)

Resources & Contact Information

Gil Shif, **Blizzard Entertainment**, 1 (949) 955-1380 x1213; GShif@blizzard.com

Robin Chandler, **Electronic Arts**, 1 (925) 927-3610, rchandler@ea.com

Doug Lombardi, **Valve**, 1 (425) 889-9642 x160, lombard@valvesoftware.com

Christy Fritts, **Sony Online Entertainment**, 1 (858) 577-3295; cfritts@soe.sony.com

Game and software URLs:

Verant's message board for *Star Wars Galaxies*:

http://starwarsgalaxies.station.sony.com/starwars_dev_boards.html

Counter-Strike, the *Half-Life* MOD: <http://www.Counter-Strike.net>

Tom's Hardware: <http://www.tomshardware.com>

Mall of the Sims: <http://www.mallofthesims.com>

Clanbase: <http://www.clanbase.com>

Battle.net: <http://www.battle.net>

GuildBoss: <http://www.guildboss.com>

For further reading:

Edward Castranova, "Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier,"

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=294828

Interview with Mark Laidlaw, Valve's lead designer, <http://www.gamitopia.com/features/interviews/v/valve/3.php>

Interview with Minh "Gooseman" Le, creator of *Counter-Strike*, <http://www.digitalgunfire.com/cs/counterstrike/>

Valve's player connectivity survey, <http://valve.speakeasy.net/survey/>

Johanson, "A Brief History of First-Person Shooters," <http://www.netgamingnow.com/features/bhofps1.asp>

Randy Farmer and Chip Morningstar, "The Lessons of Lucasfilm's Habitat,"

<http://www.ibiblio.org/pub/academic/communications/papers/habitat/lessons.rtf>

JC Herz, "The Bandwidth Capital of the World," <http://www.wired.com/wired/archive/10.08/korea.html?pg=1> (an analysis of online games and broadband adoption in Korea)

JC Herz, "For Game Maker, There's Gold in the Code," <http://www.nytimes.com/library/tech/99/12/circuits/articles/02game.html> (free registration required) (analysis of 3D game engines as licensable assets)

JC Herz, "Learning from The Sims," <http://www.thestandard.com/article/0,1902,22848,00.html>

JC Herz, "Surfing on the Internet" (Little Brown, 1994)

JC Herz, "Joystick Nation: How Videogames Ate Our Quarters, Won Our Hearts, and Rewired Our Minds" (Little, Brown 1997)

Calendar of High-Tech Events

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- OCTOBER 20-23 **Direct Marketing Association Conference** – San Francisco, CA. It's not about spam, it's about reaching customers – trust us! To register, call 1 (877) 517-3040 (US only) or +1 (404) 584-7458; email thedma@ambassadors.com; www.the-dma.org/dmaannual/index.shtml.
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