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10TH YEAR
ANNIVERSARY ISSUE

MAY 2004

game developer

THE LEADING GAME INDUSTRY MAGAZINE

» VISIONARIES' VISIONS

THE NEXT 10 YEARS

» JASON RUBIN'S

CALL TO ACTION

» POSTMORTEM

SURREAL'S THE SUFFERING

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POSTMORTEM

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Before you even get to the problems you typically see listed in our postmortems, you need to nail down your design. What's your control scheme? What are the rules of your gameplay? What is your game even about? Surreal Software got those answers down—but it wasn't easy getting there. See what worked and what didn't work in designing *THE SUFFERING*.

By Richard Rouse III

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If you're a fan of making money, you've got to be curious about how Sony Online Entertainment runs *EVERQUEST*. You'd think that the trick to running the world's most successful subscription game 24/7 would be a closely guarded secret, but we discovered an affable SOE VP who's happy to tell all. Read this quickly before SOE legal yanks it.

By Rod Humble

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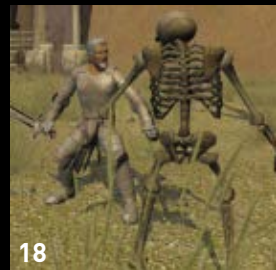
Given the sizable window of time between idea and store shelf, you need to have some skill at predicting the future. We at *Game Developer* don't pretend to have such skills, which is why we asked some of the leaders and veterans of our industry to give us a peek into what you'll be doing—and what we'll be covering—over the next 10 years.

By Jamil Maledina

32 THE ANTI-COMMUNIST MANIFESTO

Jason Rubin doesn't like to be treated like a nameless, faceless factory worker, and he doesn't want you to be either. At the D.I.C.E. Summit, he called for lead developers to cultivate an industry awareness of their contributions that will trickle down to help their teams in negotiations. We decided to test his theory. See how Jason does.

By Jamil Maledina



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YOU CAN REACH JAMIL MOLEDINA AT JMOLEDINA@GDMAG.COM



NEXT GENERATION PLATFORM

THIS ISSUE MARKS THE TENTH ANNIVERSARY OF

Game Developer, and while we did entertain the idea of celebrating it by enclosing a fine commemorative plate shrink-wrapped to the magazine, we ultimately chose to put in your hands a vital, new iteration of our publication. Like any good sequel, to borrow a phrase from Bing Gordon, this *Game Developer* is one third new, one third improved, and one third exactly the same.

Numerology aside, there are a couple of strong reasons to evolve the magazine. Over the past 10 years, *Game Developer* faithfully served the disciplines of programming, art, design, and audio, expanding its range of coverage as the industry grew. Now that our industry has grown to rival the film and recording industries, depending on what you include and exclude, it's necessary for us to expand our coverage again, this time giving business, legal, and management issues their own column, titled Necessary Evil. It debuts on page 51, with the inside scoop on approaching publishers, by Seamus Blackley.

We're also giving greater attention to overall industry issues in the features, as evidenced by this issue's story on the business of EVERQUEST on page 18. While some remark that the MMOG market is too hard to break into, Rod Humble, a VP at Sony Online Entertainment, lays out exactly how to run a successful 24-hour service, and manage a subscription game. But he's not the only one out there making it work. At the Game Developers Conference, Mark Jacobs of Mythic Entertainment told me he wasn't daunted by the market's profile, and by using a public domain brand, he was also able to build and operate a successful MMOG, DARK AGE OF CAMELOT. At the D.I.C.E. Summit earlier that month, Sheree Tsao of InterServ International, a developer/publisher serving Taiwan and China, mentioned over lunch that MMOGs are the dominant form of gaming in their region, given the rampant piracy of SKUs, and that many publishers are eyeing that market intently.

Which brings me to the second major reason to evolve the magazine. News happens all around us, and with GDC and D.I.C.E. falling in the same month, news can easily overwhelm rigidly structured news coverage. So we're breaking the mold, and expanding our news coverage into a highly flexible multi-page Heads Up Display. Our news coverage now takes

advantage of the lead times inherent in print media to lend perspective to the news, through in-depth reporting and alternative perspectives from the developer community. And when major events happen, like Jason Rubin's incendiary address at D.I.C.E., we can cover it as a feature, as on page 32, instead of trying to fit it into a pre-structured paragraph or page. Thus from now on, content will dictate form, and not vice versa.

This enables us to track interesting trends as they develop. For example, middleware is becoming an increasingly critical element of game development, especially as we teeter between platform generations. Valve held court at GDC to rapt audiences at the ATI booth at GDC, demonstrating their Source engine from HALF-LIFE 2, which encompasses a wide range of AI, animation, physics, and rendering systems. Criterion showed their solution on an invitation-only basis, offering an infrastructure for 500 game development processes that is generation-agnostic, to be delivered as part of a hands-on service program. Similarly, THX is branching out in game audio and video certification through a developer service program. These proactive steps by vendors both in and ancillary to the industry offer unique and comprehensive opportunities for developers to focus on what they do best, which may be the most important theme at the GDC this year (other than the mantra "We need a *Citizen Kane!*").

And like good middleware, our own redesign also gives developers a chance to focus on what they do best. A Thousand Words, a brand new section at the back of the book, gives game artists a stage to share their original art from games in development. We're also introducing First Person comments, for developers to contribute a line or two on the news of the day, when they don't have the time to string together 750 words or more. All of these changes underscore our continuing commitment to reflect, inform, and represent the full range of the game development community.

Welcome to the second decade of *Game Developer*.

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Managing Editor

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RENDERWARE TO THE RESCUE

MY COMPLIMENTS TO MR. GRAY ON HIS

fine **SECRET WEAPONS OVER NORMANDY** Postmortem article (February 2004, pages 40–45). In the first point under “What Went Right,” Mr. Gray details their decision to use RenderWare Graphics. I couldn’t agree more; we used an older version for our NetAthlon product and are beginning work on NetAthlon 2 using the latest version of RenderWare. The ability to hit the ground running from a programming standpoint and to have a foundation for an art asset pipeline was critical for us. I’d also like to add that with RenderWare, it is amazingly easy to extend the rendering engine’s capabilities. For example, we are implementing a LOD system for our terrains based on Jonathan Blow’s Unified Rendering LOD (detailed in the March-July 2003 issues); RenderWare is well suited for this.

Paul Stewart
Chief Technology Officer
FitCentric Technologies, Inc.
www.fitcentric.com

THE GOOD OLD DAYS

I REALLY ENJOYED THE DECEMBER

2003 issue of *Game Developer* magazine. The retrospective article brought back a ton of memories, as I was an original contributing editor for the magazine.

Sometime in mid 1994 I remember getting a phone call from a fellow named Alex Dunne. For the previous year or two I had been writing shareware utilities—editors and alteration EXEs and data—for then-popular games. Alex had used one of my routines and called. He mentioned a fledgling magazine called *Game Developer*



and asked if I’d want to write a column on how games work, and how to alter them. We discussed it and I began writing a column called The Chopping Block, where I’d take apart a popular game and then discuss how to fix it so it would work (altering weapons, targeting, maneuverability, and so forth).

Although we never printed it in my author bio, I’m a former government intelligence agency employee (got laid off in 1992 when the Soviet Union collapsed). I learned how to take apart and analyze compiled software. I was a spacecraft intelligence analyst and as such, I learned much about computer graphics, spacecraft sim and modeling, flight dynamics, and so on. They all came in handy when I decided to begin making games. Back then there were no good books or classes on game programming or design, so I took my knowledge from my government work and used it for making games and game utilities. The Chopping Block articles went well until I began getting legal threats from companies such as LucasArts because we were publishing

work breaks. Her analysis and logic skills were impeccable. I believe we used her for beta testing a few games after that.

Wayne Sikes
Lead Developer
Her Interactive
www.HerInteractive.com

ALTERED EGO

I WAS MOVED WHEN I READ “THE ZEN

of the Professional Artist” (Soapbox, February 2004). I work for a graphics/visualization research group and have found my inspiration and motivation lacking. I’m a programmer with many more years of experience on my own than with a company or in academia. I have found it very difficult to work on projects where the software design responsibility rests mostly with others, while I simply do the work to create the product.

I miss having complete creative freedom. Reading the Soapbox column enlightened me of this fact. The times I have been inspired working for this group I can count on one hand. Each time was when I was given creative freedom with some aspects of the product.

After reading the column, I see the possibility of “altering [my] own perception of events.” My ego has been attached to the outcome. In the process, I lost sight of what we have been creating as a team.

Andy Ames
via e-mail

their proprietary concepts.

Yep, this industry has changed a lot over the years. I originally got into it because I wanted to make the world a better place. It was totally satisfying watching people enjoy my games and I loved hearing from them. I remember getting a phone call from a very intelligent, witty lady that had found a logic bug in one of my games. She said they played it during their work breaks for stress relief. I tested the SAV file she sent and sure enough she had found one of the few bugs in that game. We talked at length several times about game design. She was hesitant to give me her name but I finally coaxed it out of her. Turns out she was a major news magazine anchor for ABC, and the crew on her show played the game during

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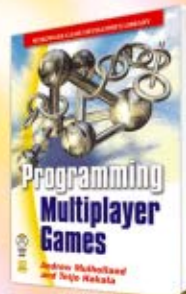
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SIXTH ANNUAL



Best Game

Savage: The Battle for Newerth (Open)
Oasis (Web/Downloadable)

Innovation in Game Design

Bontago (Open)
Oasis (Web/Downloadable)

Innovation in Audio

Anito: Defend A Land Enraged (Open)
Dr. Blob's Organism (Web/Downloadable)

Innovation in Visual Art

Spartan (Open)
Dr. Blob's Organism (Web/Downloadable)

Technical Excellence

Savage: The Battle for Newerth (Open)
Yohoho! Puzzle Pirates (Web/Downloadable)

Audience Award

Savage: The Battle for Newerth (Open)
Yohoho! Puzzle Pirates (Web/Downloadable)

www.igf.com



Daniel James and his Three Rings team storm the IGF stage to claim their booty for Yohoho! Puzzle Pirates

EA Funds USC Game Development Program

The University of Southern California, with the help of a multi-million dollar grant from Electronic Arts, added a new EA Interactive Entertainment Program to the USC School of Cinema-Television. This three-year Master of Fine Arts degree program is supported by an experienced faculty, led by Scott Fischer, and supervised by a Board of Councilors that now includes EA's Don Matrick, President of Worldwide Studios at EA Canada. Teaching game development isn't new for USC though, as they had a minor available for undergrads. Their program includes professors Tracy Fullerton and Christopher Swain, who along with Lavamind founder Steven Hoffman together wrote the book *Game Design Workshop*. According to Jason Scott, the president of SCFX, the school's special effects student group, USC's approach explores "game design from a creative content point of view."

—JM (disclosures: Jamil edited *Game Design Workshop* and was a member of SCFX at USC).

"THE CONSOLE AUDIENCE HAS GROWN UP."

—Michael Gartenberg, *Jupiter Research*, in pointing out the average console gamer is 25 years old.

FOURTH ANNUAL



Game of the Year

Star Wars: Knights of the Old Republic (BioWare Corp.)

Original Game Character of the Year

HK-47 from Star Wars: Knights of the Old Republic

Rookie Studio of the Year

Infinity Ward for Call of Duty

Excellence in Audio

Chuck Russom for sound effects in Call of Duty

Excellence in Game Design

David Chateaufneuf, Patrice Desilets, Jordan Mechner, and team for game design in Prince of Persia: The Sands of Time

Excellence in Programming

Dominic Couture, Feng Quan Wang, and team for graphics programming in Prince of Persia: The Sands of Time

Excellence in Visual Arts

Masanao Arimoto, Yoshiki Haruhana, and Satoru Takizawa for art direction in The Legend of Zelda: The Wind Waker

Excellence in Writing

David Gaider, Drew Karpyschyn, Luke Kristjanson, and Peter Thomas for writing in Star Wars: Knights of the Old Republic

Game Innovation Spotlights

EyeToy: Play (Sony Computer Entertainment Europe)
Viewtiful Joe (Capcom)
WarioWare Inc.: Mega Microgames (Nintendo)

Lifetime Achievement Award

Mark Cerny, production genius and master collaborator on such successes as arcade classic Marble Madness, the Crash Bandicoot series, and the Ratchet & Clank series.

First Penguin Award

Masaya Matsuura, a pioneer of beat-rhythm games, with groundbreaking titles like Parappa the Rapper and Um Jammer Lammy.

Maverick Award

Brian Fieta, Jason Kapalka, and John Vechev, the founders of PopCap Games, for bringing casual gaming to mainstream audiences.

IGDA Award for Community Contribution

Ray Muzyka and Greg Zeschuk, the joint CEOs of BioWare Corp., for their contribution to both the developer community and charities at large.

www.igda.org/Awards

Kodak Previews New Stereoscopic Technology

Perhaps the largest and most interesting piece of hardware on the show floor at GDC was Kodak's prototype for an auto-stereoscopic display. Although it appears large and cumbersome, it was clearly positioned as a technical demonstration, and Kodak says it is possible to design a model that would be small enough to potentially sell for home use (almost surely targeted at the enthusiast market).

I spent a few minutes playing a racing game with it, and found the stereo effect to be better than most of the other stereo displays I have used in a number of significant ways. First, since there are two separate image sources, there was none of the flicker seen in the liquid crystal shutter glasses. Second, though the sweet spot of the stereo effect is small (just eight cubic centimeters—similar to that of other auto-stereoscopic displays), I found it very easy to find. Perhaps the biggest advantage is the field of view—45 degrees for the configuration demonstrated. This aspect alone was enough to increase the believability of the simulation and make it easier to maneuver.

Because even a scaled-down display will still be expensive and larger than a normal computer monitor, the display is likely to find its first use in arcades and in development studios. —PS



Fred Jones amidst the tools that work



Preserving Creative Intent

EA's Fred Jones won't buy something just because it's cool. The audio chief engineer's sound and implementation rooms at EA's Redwood Shores campus have the latest Genelec speakers, Avid editing decks, and Apple HD Cinema screens, but not one piece of wireless technology. His development approach is coldly pragmatic: "I use the tools that get the job done." If it doesn't directly improve the game, or could potentially let him down, there's no point in adopting it. He did however sign EA up for THX's game certification program.

Renowned for their cinema and home audio certification programs, THX's approach to games covers both audio and video calibration and consultation. The wholistic service is designed to deliver reference-quality audio and video to a diverse range of developers while working on the game, and then translate that same experience to gamers' living rooms.

A few months in, EA's Jones is finding that the job is in fact getting

done. Every single room that a developer works in recreates the same balance of sound effects/foley, score, and so forth, matched to visual elements, practically eliminating the variance from working in multiple environments. Furthermore, Jones found himself taking advantage of THX's expertise as audio/video consultants. For situations where he lacked the technical resources to nail down errant noise, he simply relied on analysis by THX to nail down the problem and budget in resources to fix it. According to THX's director of advanced technology, Mark Tuffy, the goal is "to ensure that the developer's intent is fully realized in the final product." To this end, THX is not only certifying games, but also developing an audio games mode featuring 360-degree sound for consumer electronics licensees, and a console certification program for the next generation.

Dolby Labs is also hard at work preserving creative intent with minimal fuss, as evidenced by their

THX Developer Tools:
Game certification program
Studio certification program

Dolby Labs Developer Tools:
Dolby Pro Logic II coding system (free license)
Dolby Digital coding system (free license)
Dolby Game Developers Forum (free membership)



"I'M NOT INTERESTED IN VIDEOGAMES."

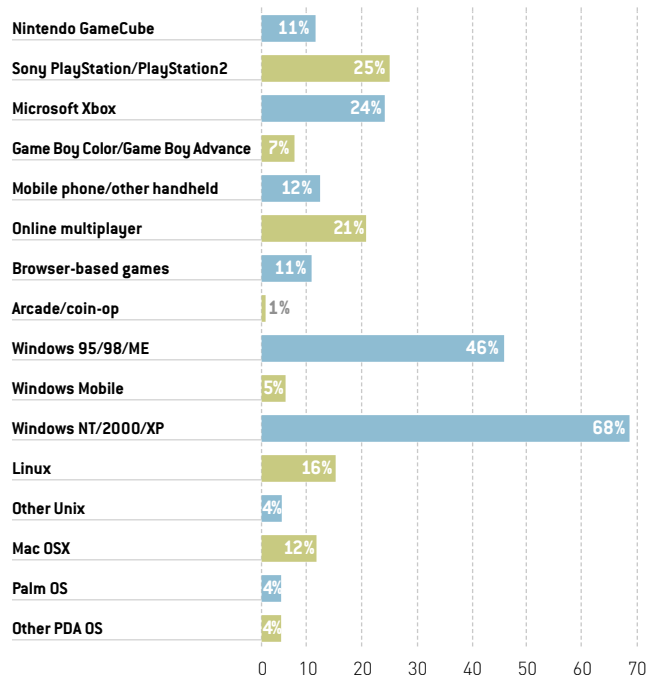
—Phil Tippett, Tippett Studios, answering a question about *Doom 3* following his Animation Keynote address at GDC.

presentation at GDC 2004 of a decoding system for Dolby Pro Logic IIx, a technology that enables active logic steering between four back speakers, extrapolated from the rear two channels of an existing 5.1 signal. Therefore, developers can simply add the new system to their 5.1 work and realize the 7.1 benefit. Dolby's Jack Buser explains that they "don't want developers to have to do anything they're not already doing." Dolby also unveiled the Dolby Game Developers Forum, an online posting board in which Dolby experts respond to developers on issues that were previously confidential. Membership is free for qualified developers. Parallel to THX's philosophy, Buser points out that their goal is "to recreate sound as the artist intended."

But getting the game out clean is only half the story. On the hardware adoption side, there's still room for

improvement. According to a poll by IGN, 37 percent of gamers have their consoles hooked up to a home theater system. Similarly, according to an internal THX survey, home theater owners are also crossing over. In a regional survey of 5.1 channel home theater owners, 50 percent have at least one game console connected to it, and 78 percent of those felt the surround sound was important to the experience. While these numbers show an increasing connection between gaming and home theater, they also show that a disparity still exists between 5.1 haves and have-nots. However, this doesn't ruin the sanctity of the game audio for EA's Jones, since he doesn't consider high-end audio adoption rates a zero-sum issue. By developing for Dolby Pro Logic II, EA can easily create sound mixes that make the best of mono, stereo, and 5.1 audio setups. —JM

For which of the following platforms are you developing your current or most recent game? *



*Q4 2003 Game Group Research

PSP Developer Tools Abound

Though only sparse details about the PlayStation Portable have been announced by Sony, many key tools developers at GDC were already announcing their commitments to support the PSP. Details were sketchy, but the basic capabilities of the tools or plans for them were shared. Both Criterion Software (its full Renderware suite) and Havok (physics engine) announced their middleware packages will fully support the PSP; Discreet announced its intent to create a 3DS Max export utility, and both SN Systems (ProDG Plus) and Metrowerks (CodeWarrior Development Studio) announced complete development environments—including compilers, debuggers, and analysis tools. Despite the 2005 ship date for the PSP, in some cases, more details and early versions of some of these tools are available to game developers that have signed the proper NDA. —PS



The D.I.C.E. Summit

The Academy of Interactive Arts & Sciences D.I.C.E. Summit is sort of GDC in a box. That is, a conference consisting of a single track held in a single meeting room in a trendy Las Vegas hotel two weeks prior to the GDC. Think of it as GDC without all the



walking, less classes, lots fewer people (unless you count the folks queued up to get into the Ghost Bar at the Palms), only one awards ceremony, but free breakfast and gambling. Oh, and golf.

Attendance was a mix of creatives and business types, with a smattering of the gaming press tossed in. The conference

— continued on page 63

Test-Drivers Wanted

Can you reform pirates? Perhaps, if you give them a chance to test-drive 18 WHEELS OF STEEL ACROSS AMERICA free of charge, says Gabe Zichermann, strategy and communications VP of the San Francisco-based Trymedia. Trymedia (www.trymedia.com) makes its partners' PC titles digitally available through popular download venues such as Gamespot, eBay, and Yahoo! Atari was the first publisher to sign on to Trymedia's digital delivery system, followed by Ubisoft, Capcom, 3DO, and many others. Strategy First, the publisher of the DISCIPLES series, is the latest addition to the lineup.

Trymedia's delivery system encompasses even the legally dubious peer-to-peer networks, blamed by the Recording Industry Association of America for facilitating unauthorized distribution of copyrighted materials. "Some players have admitted to me," says Zichermann, "that they resorted to pirating games because they had no other ways to find out what the gameplay would be like." Granted there are those who engage in

piracy solely to steal or make a profit. But thousands of otherwise legitimate gamers are driven to engage in questionable download practices largely by the lack of a means to test-drive games they're thinking of buying.

To accommodate the try-before-buy approach, Trymedia offers solutions built around its ActiveMark technology, which allows players to easily acquire, try out, share, and even duplicate games—all without compromising copyrights. At the

end of the trial period, players have the option to purchase the full version, directly from within the game. At GDC 2004, the company announced that its latest clients, Eidos and Popcap, will start deploying ActiveMark 5.2 for not just online distribution but also for retail boxes.

Initially Trymedia served as a platform where publishers could generate additional revenue on old titles destined for bargain bins. But some publishers have discovered that posting the trial version immediately following a product's retail launch could increase sales. In 2003, THE TEMPLE OF ELEMENTAL EVIL, MAGIC THE GATHERING: BATTLEFIELDS,

— continued on page 63



>> first person

Is it me, or has this GDC given us an industry split into two camps?

On one hand, I see companies who take as their highest priority their responsibility towards their investors. Clamoring towards the mythical safe bet, they talk about using research to determine how to move the largest gameplaying demographic towards forking over another 50 bucks. Then they talk about using research to determine what other demographics like, and what works with them, so they can reach out to those consumers. For this camp, the lesson of the year is "you are not your market," followed closely by "do your homework," and "this isn't an industry of geeks anymore" and "make room for Hollywood" and "licensing music for games is fun and easy." This group is so busy trying to please daddy they are actively abdicating their earned right to be amazingly creative in an industry they built from scratch.

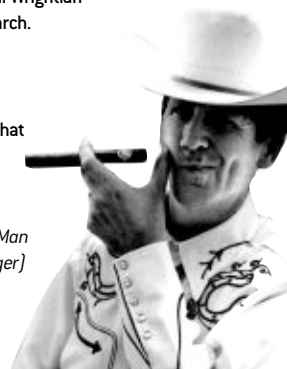
On the other side, I see the developers who are their market, no matter what market they are shooting for, if any. These are people who take as their highest

priority the quality of the game. They can't help it, because they are geeks. These game makers would make games with or without funding, with or without computers, with or without arms and legs, and their presence was signified by talks like Erik Zimmerman's Love Story game design contest between Raph Koster, Will Wright and Warren Spector, and by Ernest Adams's very earnest talk on the philosophical roots of gaming. Eternal CA Verin Lewis, who launched his game JOSH'S WORLD from his living room, had a few things to teach all of us about integrity and focus.

Game makers are artists. It is the inexplicable mutations called THE SIMS, PRINCE OF PERSIA, GRAND THEFT AUTO, MYST, and even TEMPEST that breathe the Fire of Life into our games. Miraculously, fostering the near-insane mentality of the designers that create these games is the real duty of the game company that is responsible to its investors. Incremental improvements in shading and speed and game size and demographic and price point only waft to us the plastic-tinged breeze of commercialism disguised as progress. Let

the inevitable commercial and technical expansion come; that will be the river that carries us along. But the real gamers, the performers who are their own audience, will be unable to resist building great vehicles that will intensify our intentions, expand our aesthetics, and will bring real riches and satisfaction to those who defy all but the most unconventional Will-Wrightian analysis and research. These truly great games will be the boats upon which we will ride that polluted river of money.

—Col. Rev. The Fat Man
(a.k.a. George Sanger)



3D Input for All

One of the perennial sights at any computer graphics conference seems to be some sort of 3D input device. At this GDC, there were at least four companies pitching various devices—3Dconnexion (with its SpaceBall and SpaceTraveler, designed for content creators), Jestertek (showing HoloPoint, a two-camera 3D tracking system suitable for arcade games and a single-camera version with fewer degrees of freedom), and RoninWorks (with a modified Logitech mouse that becomes a 3D mouse when lifted off the table, also for DCC types). All of these products are cool and have an obvious place in the food chain, but the one that seems likely to reach broader adoption is the Gametrak—a \$99 game controller that uses a mechanism simple and reliable enough (two strings on retractable spools with two potentiometers for the tilt angle and a third for the extension distance) to avoid any lag while still being affordable. Games will have to be written specifically for this controller, but the variety of schemes it seems capable of supporting (demonstrated were a sword, boxing gloves, and a golf club) could make it work with enough genres to make it the next EyeToy. —PS



“SIZE + CREATIVITY = LETHAL COMBINATION.”

—Bing Gordon, co-founder, chief creative officer, EA

PC-Police Nab Namco

Namco jumped into the PC game publishing business by signing on developer Flagship Studios. While conventional wisdom suggests that the major sales are in console titles, Namco Hometec's COO and CFO Robert Ennis said that focusing exclusively on the console market, as Namco has done, does not “represent the complete picture.” In “aggressively trying to grow the U.S. market,” Namco is “developing a long-term strategy to grow the PC market,” according to Ennis.

For Flagship Studios, formed in late 2003 primarily from Blizzard North alumni, Namco represents an ideal partner for their first game. According to CEO and co-founder Bill Roper, the two cultures mesh in their “design philosophies, emphasizing quality over quantity.” Although Roper cagily avoided sharing any details about the game other than a few cheery concept images, he did note that the connection with Namco came about rather informally. Flagship had actively been seeking a publisher for their first game since their formation in June 2003, yet it wasn't until Roper's November 2003 presentation at the Kohnke Conference on public relations that a Namco representative approached him in the hallway following his presentation. They clicked right away, the paperwork was fast-tracked, and the mystery game, already in development, came a lot closer to becoming a SKU. —JM



“BUILD THEME PARKS,
NOT JUST SANDBOXES.”

—Rich Vogel, producer, STAR WARS GALAXIES on designing MMOGs

American Enters Seven Kingdoms

American McGee, best known for ALICE, a nightmarish interpretation of Lewis Carol's bedtime story, has taken refuge at Enlight (www.enlight.com), a company founded by Trevor Chan, the development wizard behind SEVEN KINGDOMS.

McGee says he left EA four years ago because of the dearth of creativity among big publishers: “In many cases, there's no room for a title that isn't guaranteed massive success. This leads to an atmosphere that cannot support original ideas.” The consequence, McGee points out, is a proliferation of sequels and clones designed to capitalize on past successes.

For developer brethren stuck in a similarly frustrating situation, McGee suggests an alternative: working with lower-tier publishers who are willing to experiment with something new. “As larger publishers become more hesitant to take risks on less established brands, it provides an opportunity for publishers like Enlight to fill that void,” says Enlight's Chan.

The amalgamation of McGee's atmospheric narrative style with Chan's emphasis on strategic elements can spawn an entirely new genre: “We have a great opportunity to

take the best of our two styles and develop new and exciting titles,” says Chan; “A title that blends multiple genres and allows the players to choose their focus is probably more indicative of the type of games that are the future of interactive entertainment,” predicts McGee. Neither McGee nor Chan is prepared to reveal details about their upcoming project, other than to say it's an action title already in production.

McGee is also involved in the creation of *Oz*, a movie trilogy based on his game of the same name, currently in co-production by Disney Pictures and Jerry Bruckheimer Films. An advocate of cross-medium concepts, McGee reveals that the current Enlight project under his stewardship is conceived as a game as well as a film. —KW



WATCH THE TAIL— IT'S LONGER THAN YOU THINK

John Schappert from EA is no expert on long-tailed beasts but, being the senior VP and general manager of one of the biggest game publishers, he knows a thing or two about the console platforms. During his keynote address "Console Transition: Will You Be Ready?" at GDC 2004, he warned developers that, even with the advent of next generation devices, the current consoles will continue to serve as a viable source of revenue for a long time to come. So "watch the tail—it's longer than you think."

OpenGL ES Gains Momentum

The sophistication and visual quality of games for PDAs and mobile phones seems sure to get a big boost in the coming year, if the recent developments relating to the Khronos Group's OpenGL ES specification are an indication. This slimmed-down version of the OpenGL graphics acceleration language—designed specifically for embedded systems—has eschewed features not needed for entertainment (Bézier splines, for instance) to get the footprint down to 50K.

That, combined with announcements by Discreet (a planned 3DS Max exporter), Intel (becoming a Khronos Group Adopter), PalmSource (adding OpenGL ES to its forthcoming Cobalt OS), and the inclusion of OpenGL ES acceleration in future mobile phone and PDA graphics chips from ATI (the Imageon 23000) and Nvidia (the GoForce line) also shown at GDC, seem likely to be enough to make the standard the dominant method of creating 3D graphics for mobile games. —PS

SOAPBOX > Standardized Credits

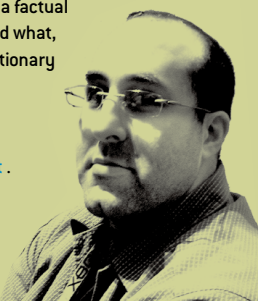
All too often we hear of complaints from developers who don't receive the on-screen credits they feel they deserve. Far from following a set of industry standards, game credits are often inconsistent from game to game within the same company. As the industry evolves, the axiom that "you're only as good as your last game" is truer than ever. Similarly, hiring studios have had their share of nightmares with bringing on new team members based on false pretenses.

Right now, credits are sometimes negotiated, often assigned at the discretion of the producer, and sometimes hard to link to the actual work performed. As a result, game credits don't enjoy the level of credibility generally associated with those assigned in cinema or television. The IGDA recently established a Credit Standards Committee to address the issue of credit standardization. The goal is to establish generally accepted guidelines that all studios and publishers can use, voluntarily. Standardization of job titles and credit assignment would remove a major

bone of contention between individuals, development studios and publishing houses.

When a dispute occurs, standards would bring clarity to the situation, such as when an employee leaves during the middle of a project. Some studios feel justified in removing the employee from the credit list out of spite or to provide greater visibility to the people who remain, no matter what the departing employee's contribution to the project might have been. Standardized credits would then become a factual statement of who did what, rather than a discretionary bonus. For more information on our efforts, visit www.igda.org/credit.

—Jason Della Rocca,
Program Director,
IGDA



How to Get \$7,000 from Sony Ericsson

Sony Ericsson invites game developers to enter its Game Developers Challenge (www.sonyericsson.com/gamechallenge).

Submission is open until June 24. Games must be based on the Java MIDP 2.0 platform.

Between June and September, consumers will be asked to try out and evaluate the top 20 submissions. On September 3 a jury made up of 20 veteran developers will pick three winners—one from Asia Pacific; one from Europe, Middle East, and Africa; and one from

the Americas—for a \$7,000 cash prize each. The winning games will receive prominent placement on Sony Ericsson Application Shop and help with commercial distribution. For peer support, forum discussions, and technical documentations, contestants may visit Sony Ericsson Developer World (www.sonyericsson.com/developer), a community portal Sony Ericsson launched last year in partnership with Metrowerks, Sun Microsystems, Borland, AppForge, and others. —KW



The life blood at GDC

"PEOPLE ARE INTERESTING,
BUT NOT INTERESTING
ON-DEMAND."

—Rich Vogel, producer, STAR WARS GALAXIES

Crunch Mode Audio Fix

As game productions get more and more complex, licensing production audio clips can help meet a tight deadline in a relatively cost-effective manner. To that end, Associated Production Music showcased their game audio library on the GDC show floor. APM's production music library consists of some 3,500 CDs and 175,000 tracks covering just about every style of music you can think of, from electronica to orchestral scores and beyond. License fees vary by scope and type of project. A Game Audio Kit with audio samples is available at www.apmmusic.com. —DM

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Bella Centre
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Cost: EURO 27–810
www.3dfestival.com/2004/conferences/gdw/

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3DS MAX 6 IN TWO TAKES

MICHAEL DEAN & SPENCER LINDSAY

IN EVERY INDUSTRY, THERE ARE A FEW products whose presence is close to universal, ones that deserve a little extra attention and a wider range of perspectives than do other programs in other disciplines. In this industry, 3DS Max is clearly one of those, not only because of its wide adoption, but because of its range of capabilities—from modeling to animation to rendering. However, this very diversity makes it rare to find any one individual who uses all aspects of it equally, day in and day out.

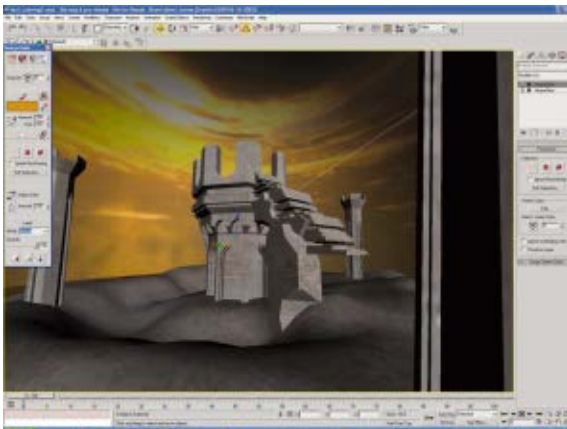
So with that in mind, and to take advantage of this section's redesign, we've decided

to mix up our old formula a bit and have two reviewers take apart 3DS Max 6—reporting on the areas of the product that each uses most in their everyday work. We lead off with Take One—Michael Dean's perspective, focusing on the modeling and texturing improvements since 3DS Max 5. In Take Two, Spencer Lindsay covers the rendering and animation improvements, while overlapping Dean's coverage of the Vertex Paint module.

In the end, both give 3DS Max 6 high (but slightly different) scores, and slightly different recommendations on whether you should upgrade. A few features neither covered will nonetheless be of interest to many—among them, relaxed UV editing to reduce the texture mapping headache and better integration with Criterion.

—Peter Sheerin

rified outline of the current scene. Interactivity was limited to selection, linking, and a few other simple tasks. With the current version, all of the objects and modifiers present in 3DS Max are organized, editable, and viewable inside of the schematic view. All of the power and functionality present in a standard viewport are now accessible via the schematic view. One of the best examples of this is the Wire Parameters function, which enables the user to set expressive relationships between related or unrelated objects in a visual and/or mathematical manner. It is now simple to set up relationships such as the left thumb curling on a character when the right thumb curls, as the user no longer has to make sure these spaced-apart objects are both visible in a viewport.



Both Dean and Lindsay found the vertex painting tools in 3DS Max 6 to meet their expectations as artists—it offers the features and interaction that they are already familiar with in Photoshop and other tools, even including layers.

TAKE ONE

Michael Dean

3DS MAX HAS CERTAINLY embedded itself firmly into the game production studio environment. Chances are, no matter what 3D package a studio uses, many of the artists at that studio also are adept at 3DS Max. It has more or less become the 3D equivalent of Photoshop: it is the package 3D artists are expected to know.

THE FACE-LIFT. Interface improvements have been added throughout 3DS Max 6, though it may not be immediately apparent to even advanced users (besides the addition of the Reactor shelves). Most of the interface improvements have been made at the module level. For instance, the design of the layer manager is improved and has a more integrated, refined feel. On a more basic level, some of the main menu items have had their commands grouped together into a cleaner structure. Nothing major here, but it does help to clean up the interface and improve workflow.

One of the most notable improvements is the enhancement of the schematic view. In previous versions, it was more or less a glo-

MICHAEL DEAN

PRETTY SLICK

PROS

1. Schematic view has been improved both functionally and visually.
2. Vertex Paint modifier has been enhanced to the level of a genuine 2D painting package.
3. FX (DX9) shaders are viewable and editable in your shaded-mode workflow.

CONS

1. Many of the features, especially those buried within the Editable Mesh modifier list, would benefit from better organization.
2. Character Studio is showing its age, especially in regards to its layering system, customizability, and increasingly clunky interface.
3. Unless Mental Ray and a more functional schematic view are huge production tools for your studio, version 6 may not be worth the upgrade price.

3DS MAX 6

STATS

Discreet
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www.discreet.com

PRICE

\$3,495 (\$795 upgrade)

SYSTEM REQUIREMENTS

Windows 2000 (SP4) or Windows XP (SP1), Intel Pentium III or AMD 300MHz processor or faster (Dual Intel Xeon or dual AMD Athlon recommended), 512MB RAM and 500MB disk swap space (1GB RAM and 2GB swap recommended), 64MB OpenGL/DirectX 8.1 graphics card (256MB 3D DirectX 9 graphics card recommended).



On top of the many functional enhancements of the schematic view, the visual enhancements are present as well. Background images can now be added independently to the viewport, and can be used as a visual guide for laying out schematic nodes. A script included with the software allows a user to select an active viewport and arrange the linked nodes so the world-space of the selected viewport is duplicated in the schematic view. Truly, the schematic view has evolved to the point where it is one of the more useful viewports in the 3DS Max arsenal.

VERTEX PAINTING. Artists fortunate enough to create content for game engines that support the importing of vertex color painting will be quite pleased with 3DS Max's overhauled vertex painting engine, with improvements in both interface and functionality. Vertex painting now behaves much more like it does in a traditional 2D paint package such as Photoshop or Painter. It is complete with—most noticeably—a very nice toolbar, layers, layer types and settings, the ability to paint in the sub-object mode without having to revert from the modifier back into sub-object mode, and a more intuitive workflow.

Artists who are developing games for the PC or Xbox will be glad to know that .FX shaders are natively supported in 3DS Max. These DX9 shaders have enhanced attributes that support the advanced features found in a typical gamer's video card. Vertex normals are fully viewable and editable inside 3DS Max 6. Of course, the texture painting itself must be done in another package, but the effects of the created texture are immediately apparent inside 3DS Max 6 and respond appropriately to a scene light source. It would be nice to see this working with multiple light sources, to better mimic a game environment, but it's a good start. 3DS Max's Direct3D support is the best of any package out there, and it is obvious this is becoming a big deal with any developer interested in easily grasping and visualizing the latest graphics tricks.

Another nice new feature is the Shell

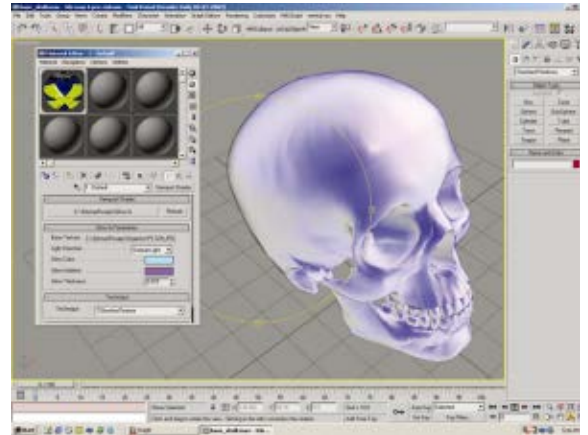
modifier. This is a simple and effective way to give a thickness to zero-thickness standard polygonal surfaces. It may seem like a simple extrusion or bevel at first glance, but in fact interpolates the extrusion path on both an individual face-normal and group-normal basis, and effectively scales the extruded faces to match the extrusion distance. It also intelligently maps the resultant edge faces created between the inner and outer shells.

Eclipsing most of the functionality of Character Studio's Physique once and for all, the skin tool now has the ability to mirror skin weights. The arduous process of getting those perfect, precise weights on a character's shoulders, only to be completely demoralized by having to do it all over again on the other shoulder, has become a thing of the past. Of course, characters lacking symmetry in these crucial areas won't benefit from the mirroring of skin weights, but they may benefit from its sibling tool for mirroring skin envelopes.

The optional Character Studio module of 3DS Max is largely unchanged, and its aging interface and somewhat rigid functionality are becoming something of a thorn in 3DS Max's side. Certainly, it has several great features, and 3DS Max would be lost without it, but modules such as this truly evolutionary skin modifier are very welcome.

WHAT DISCREET HAS DONE. With 3DS Max 6, Discreet has proven that they are not content with sitting on their laurels. Max is continuously evolving and is obviously adding features that have been requested by users. I am happy with how they seem to be moving away from the backward thinking that plagued them in the past—thinking that required adding thousands of dollars' worth of plug-ins just to bring 3DS Max up to a level of functionality offered by its competitors' standard packages.

When all is said and done, 3DS Max is a fantastic workhorse in the graphics sector of the gaming industry. It still has the greatest user support community, is the most widely known and accepted, and pushes itself from the inside to meet expectations from the outside. In most cases, it has been successful. I would like to see some of the legacy modules and



The addition of High Level Shading Language support to 3DS Max 6 means much more sophisticated visual effects can be created that match the capabilities of the recent 3D gaming cards, including pixel and vertex shaders.

plug-ins disappear, paving the way for more integrated, updated solutions to art and design problems. Specifically, I would like to see the character system take its cue from the Skin Modifier and overhaul itself into a more cohesive plug-in better integrated with the base Max package.

Sure, most of the changes in 3DS Max 6 are small, barely incremental changes, but they all add up to a more cohesive package that understands its user base better. This is the most functional, user-friendly version of 3Ds Max to date. ❖

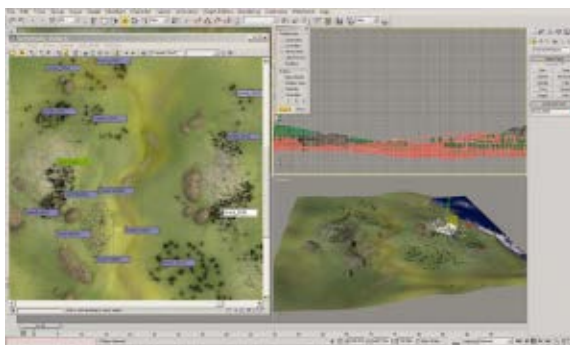
Michael Dean is an artist with ten years' experience, currently working at Ion Storm, Austin. He is busy working on the latest THIEF title.

TAKE TWO

Spencer Lindsay

BEING A LONGTIME USER OF MAX, I CAN

SAY that this update to an already impressive set of 3D tools is well worth the price. The modeling and rendering tools alone make it an important item on my company wish list. As with other successive incarnations of the software packages I own, the level of complexity in this version is enough to make you either want to run screaming from the room or become a specialist in one small area of the program. I challenge anyone, even the techies at Discreet, to know all there is to know about this package without having to look it up in a manual.



Among the improvements that speed the creation of content is the new schematic view—it makes creating and adjusting animations and model structure far more intuitive, and allows you to adjust components that are not even visible in a model view.

That being said, with added complexity comes added functionality. The hoops we used to jump through to get earlier versions of 3DS Max to perform some task have been replaced with smoothly operating buttons and procedures. Finding the time in your production schedule to figure out how it works might be a daunting task, but well worth it in the end.

FIRST IMPRESSION. At first glance, 3DS Max 6.0 isn't much different from 3DS Max 5.0. Although the new Reactor physics panel is different, the rest of the screen looks pretty much the same. Only when you start getting into the menus does the new functionality become apparent.

The first and most obvious addition to 3DS Max 6 is the seamless integration of the Mental Ray rendering engine. Previously available only as an additional purchase,

Mental Ray is now an integrated module of 3DS Max. Although the complexity of the controls for this feature may be a bit daunting at first, the Mental Ray engine is an amazing renderer—with enough tweaking, it can handle the most complex rendering task. The addition of Mental Ray Materials, Lights, Maps, and Shadows links you to the renderer much more closely than in the previous version of 3DS Max. Mental Ray takes full advantage of Hyper Threading, which boosts rendering speeds significantly. A nifty little tool I found useful were the Lighting Data Exposure Controls, which allow you to check the overall exposure of the scene before committing to a full render.

In addition to the new rendering system, an upgraded Vertex Paint module allows you to paint directly onto mesh objects in a very Photoshop-like way. Blending controls allow you to paint over existing colors using Multiply, Screen, Subtract, and other methods. Virtually every blend mode you're used to in Photoshop can be used with 3DS Max's Vertex Paint tool. Using layers in this utility feels very natural and intuitive.

ESPECIALLY FOR GAME DEVELOPERS.

Combining the vertex paint utility with Assign Vertex Colors utility gives you "baked" vertex colors and other object properties on the geometry you're working with to reflect the lighting in the scene. Not only can you bake your lighting into the scene, you can assign up to 99 channels of vertex colors to each vertex. This means if you are looking for a "time of day" solution for your real-time environment, you can light your scene with radiosity, ray-tracing, and so on, bake the daytime colors into the mesh, change to nighttime lights, re-render, and then bake those into a separate channel. Given two channels of color per vertex, your game programmers can then interpolate between channels to give you day-to-night lighting transitions. Add to this mix an array of pre-rendered shadow maps and you have a very powerful lighting pipeline.

If you feel the need to blow something up, set something on fire, or splash liquids around, the new Particle Flow utility is for you. An amazing array of dynamic, event-driven modules allow you to mix, match, and blend so many parameters of a particle system that knowing this module alone

could get you a job at an effects house. A schematic editor acts as an interface to these modularized controls and, after a bit of experimentation, is surprisingly powerful and easy to use. All edits are displayed in real-time so it's very easy to iterate during your design. This is one of my favorite additions to 3DS Max 6.

Another key enhancement is HDRI (High Dynamic Range Image) support. Using a panoramic HDRI map as a skylight will light the scene according to the lighting in the map. This is an excellent way to light 3D elements you plan to composite into live action later. Through an intuitive dialog box, Max also gives you full control over which part of the dynamic range of the HDRI image that you want to use.

OTHER ENHANCEMENTS. Version 6.0 has also upgraded the Schematic View. I found it to be much more useful due to several factors. The ability to place bitmaps behind the scene graph assists in figuring out where all your nodes are in 3D space—and acts as an excellent way to keep track of props and objects in an environment. This feature is extremely useful in rigging a character for animation. Bookmarks and saved layouts help you save your workspace without having to set it all up again every time you open the file. Also, you are given very quick access to the wiring dialogue by double clicking on the wires between nodes.

In addition to being functional, the new Panorama Exporter is just really cool. It provides an excellent way of previewing an environment or showing a client the current status of a project. Its ease of export to QTVR makes it web-portable and a really excellent addition to the 3DS Max toolset. ❖

Spencer Lindsay is an independent consultant who works with game development teams and design firms. He can be reached at slindsay@gdmag.com.

SPENCER LINDSAY

1/2 PRETTY SLICK+

PROS

1. Schematic view is much more useful.
2. Particle flow and integrated Mental Ray add needed depth to the package.
3. Isoline Display eases Meshsmooth modeling.

CONS

1. MaxScript still not as intuitive as Maya's MEL.
2. Particle Flow, although powerful, is very complex and may be daunting for some users.
3. Mental Ray still not as robust as the Brazil Renderer.

GAM

PC > **CONSOLE** > **WIRELESS** > **HANDHELD**

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She has the right equipment to play this game. Do you?



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Project Goldmaster Winner: Flashbang Studios

As the winner of Project Goldmaster, Flashbang Studios will develop a game based on a Cartoon Network show. The making of this game can be followed by AOL members at AOL Keyword: Project Goldmaster.

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**Innovation in Audio
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**Technical Excellence & Audience Award:
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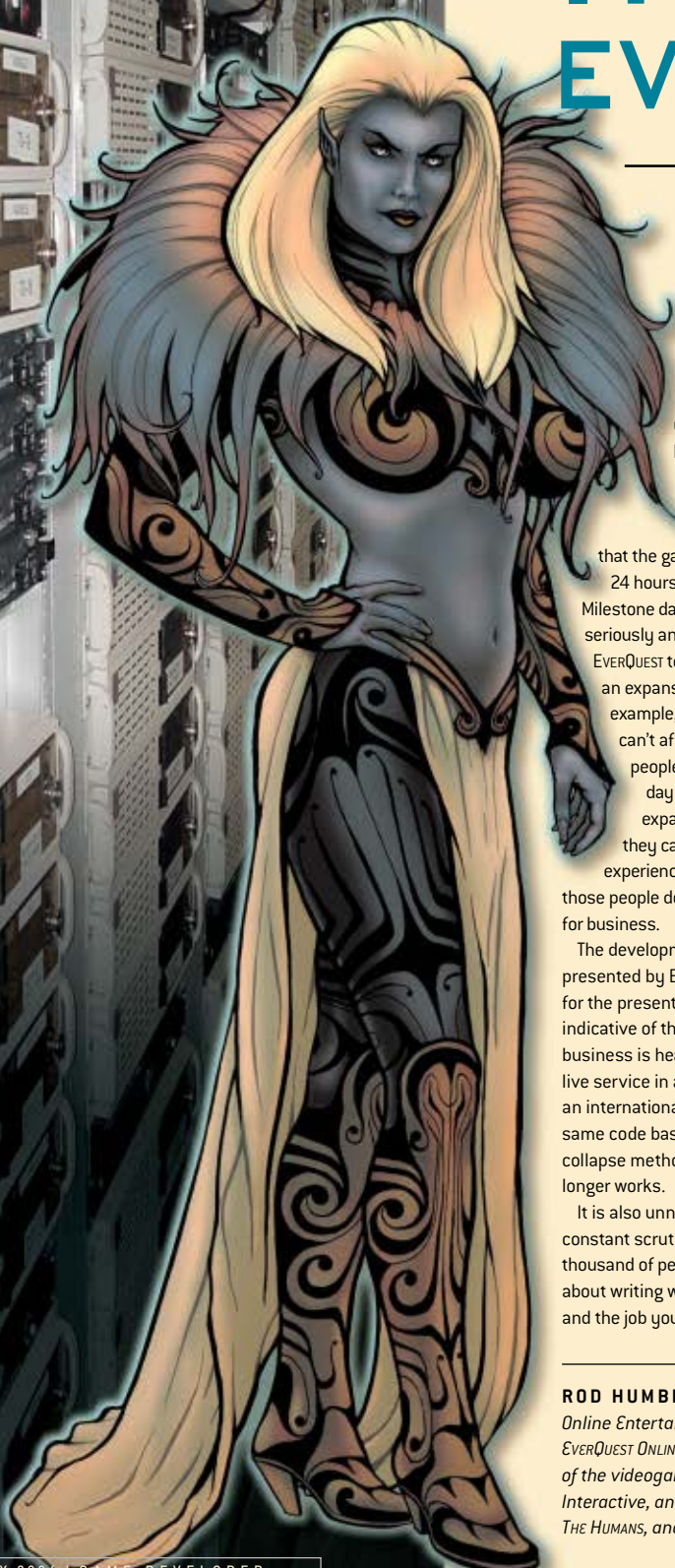
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The development problems presented by EVERQUEST are unusual for the present day, but are perhaps indicative of the direction our business is heading. When running a live service in addition to developing an international retail SKU with the same code base, the crunch and collapse methodology of old no longer works.

It is also unnerving being under constant scrutiny from hundreds of thousand of people who are not shy about writing what they think of you and the job you are doing every single

day. Working on EVERQUEST gives one a rare sense of sympathy for politicians.

THE SHOW MUST GO ON OVER THE PAST FIVE YEARS, we've learned several valuable lessons that come from running a 24-hour service, most of them the hard way.

The first big lesson took several years and millions of dollars to learn. As a game developer, you have no clue how to operate large-scale servers efficiently. The solution: Hire some professionals to do it for you. Sorry everyone, it's a blow to our ego, but it's true. If you would prefer it put more politely, game developers have better things to do.

SOE has established a separate operations department (about 30 people) who buy, set up, and maintain our game server hardware, push patches for all of our live games (including PLANETSIDE, STAR WARS GALAXIES, and EVERQUEST ONLINE ADVENTURES for PlayStation2) and monitor all the game servers 24 hours a day. The operations department does not report into the game development structure. They are totally separate and equal within the company. They have the power to say "no" to the game teams, and frequently do.

This separation of powers may seem extreme. For example, no game development team is allowed to push a patch to our customers. Instead, we put in a request to Ops, who then

ROD HUMBLE Rod is vice president of Development, Studio 1, for Sony Online Entertainment, and oversees production of SOE's leading titles, EVERQUEST ONLINE ADVENTURES, EVERQUEST, and EVERQUEST II. Rod, a 12-year veteran of the videogame industry, has worked with Imagitec, Gametek, Virgin Interactive, and Harmless Games to create top titles such as SUBSPACE, INFANTRY, THE HUMANS, and BRUTAL.

The behind-the-servers story of how Sony Online Entertainment runs the world's most successful 24/7 subscription gaming service

push the files out to all servers after running their own checks, which includes checking with our QA group to make sure the patch has passed testing.

In theory, this process could cause massive delays and inefficiencies. In practice, there is never any real delay because Ops is a true 24-hour service and it often saves developers time as they don't have to worry about or monitor file pushes. You would be surprised just how error-prone and time-consuming server pushes can be. It's much better to have other people do it while developers get some sleep.

When I say Ops is a 24-hour service, I mean it. They have a separate NASA-like control room setup in another building, with an entire wall covered by a projection of server uptime diagram monitoring graphs. If a server goes down or exhibits unusual behavior, an automatic alarm is sounded and the Ops personnel on duty immediately fix the problem. I have called Ops at every hour of the day and night and they are always there. It's quite reassuring.

Most of the time Ops can fix any service problems on their own. It's either an Internet hiccup (a router has gone down somewhere), a server crash (no code is perfect, this can still happen, and Ops reboots the box and logs all the data to help Dev debug it later), or a bad file push (mistakes still happen and Ops can usually handle fixing this on their own).

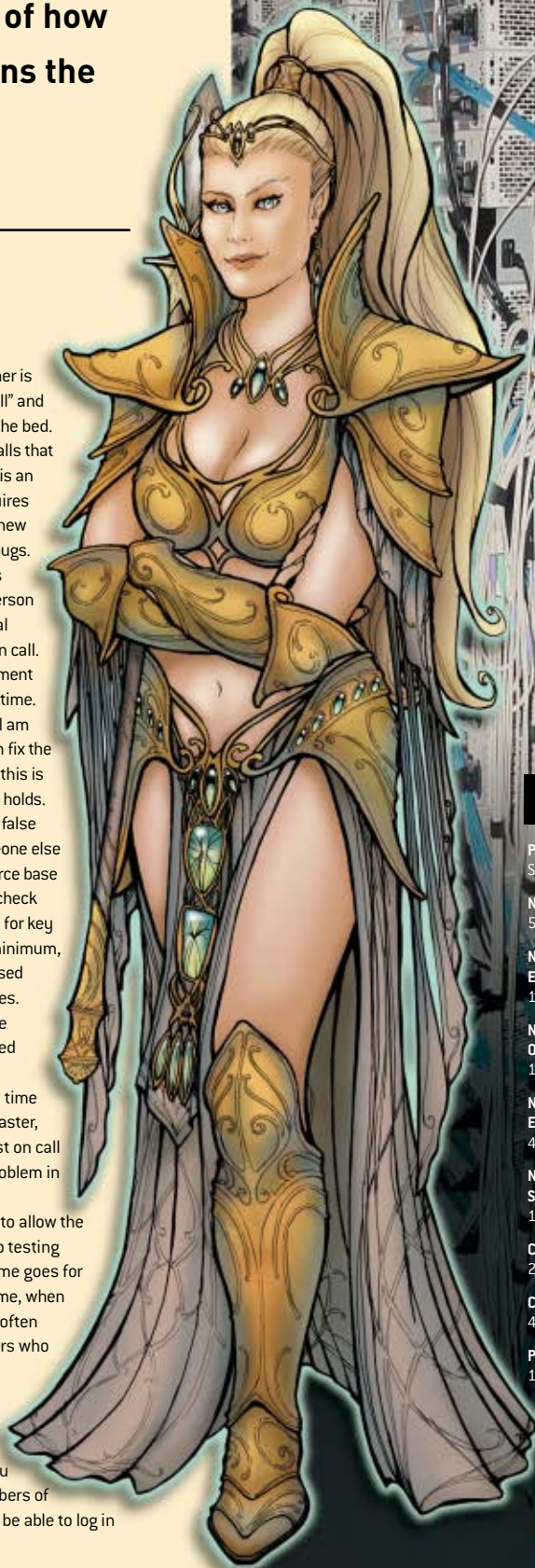
Sometimes, however, it needs a game coder to solve a problem, and there is always one available.

EVERQUEST uses an on call system, similar to real emergency services.

At night, a programmer is designated as "on call" and keeps his phone by the bed. Ops is notified and calls that programmer if there is an emergency that requires someone to make a new build or investigate bugs. If you do not use this system, the same person (usually the technical director) is always on call. Burn out and resentment set in, given enough time. One excuse used is "I am the only one who can fix the server bugs." Even if this is true, the system still holds. Often, Ops will call in false alarms; having someone else familiar with the source base to do a quick sanity check saves valuable sleep for key programmers. At a minimum, the system can be used during key crisis times.

This system can be expanded or collapsed depending on the situation. During the time leading up to gold master, there's often an artist on call in case QA finds a problem in geometry that can be fixed quickly to allow the build to get back into testing before dawn. The same goes for expansion launch time, when the scheme is most often extended to designers who can nail exploits and bugs as they are discovered day or night.

It may surprise you to learn that subscribers of online games like to be able to log in



GAME DATA

PUBLISHER:

Sony Online Entertainment

NUMBER OF DEVELOPERS ON EVERQUEST:

50

NUMBER OF DEVELOPERS ON EVERQUEST II & EOA:

160

NUMBER OF OPS PERSONNEL ON EVERQUEST:

14

NUMBER OF SERVERS RUNNING EVERQUEST:

47

NUMBER OF PCS RUNNING THOSE SERVERS:

1,500

COPIES OF EVERQUEST/EXPANSIONS SOLD:

2.5 million

CURRENT EVERQUEST SUBSCRIBERS:

420,000

PEAK PLAYER VOLUME:

100,000

and play whenever they like. Such an obvious statement often gets lost in the day-to-day running of a game. Game developers want to push fixes to customers as soon as they can. The thinking goes, "The

level 32 Iksar monk quest has been broken for days and people are crying out; now that it's fixed, lets push it immediately!" While the intent is noble, self discipline is called for. The majority of the customers usually aren't even aware of what the critical issue of the day is and certainly do not want to be kicked out of the game for half an hour to see it fixed. Sure, a couple of thousand people may welcome the fix, but as there are 100,000 people simultaneously online every night in EVERQUEST, you run the risk of irritating an awful lot of people by bringing the servers down when they are playing.

EVERQUEST patches are scheduled several weeks ahead of time. They are pushed in the early morning (Pacific time), which represents the low point for our simultaneous usage. By scheduling ahead, we let our customers know its coming, which is very important if you're organizing a raid of 100 people in your guild. We try to make these patches as regular as possible, normally occurring at the same time every week on a Tuesday. For our international servers, we patch at different hours to coincide with their low population time.

Of course, emergencies sometimes arise and we do occasional emergency patches at any time of day, including prime time. These are always scrutinized by upper management both before and after the patch, to see what went so badly wrong as to justify having to inflict downtime on our customers. Emergency patches are seen as a sign of failure and often lead to a full and frank exchange of views between everyone concerned.

Downtime is taken as seriously as an A-class bug in EVERQUEST. Every morning from 10AM until noon, Ops meets with the technical director of each game and reports on server drops, zone crashes, login problems, or any other downtime, no matter how small. This meeting is regarded as an annoyance by everyone concerned and that's a wonderful thing. It's easy for game developers to regard a few hundred people getting dropped from a game as a minor issue and blow it off for weeks, but if you are one of those few hundred customers, it's very much the number one issue. The daily meetings keep downtime bugs at the top of the heap.

Where does this instability come from? After all EVERQUEST is five years old, surely all the bugs are fixed by now? The answer is that we do not charge our customers a subscription fee just to maintain the existing service. Our customers expect constant updates to the game. In particular, there is an insatiable hunger for the hand-crafted content that EVERQUEST is famous for.

These constant updates keep the game fresh and alive. The largest live update we have done to date was the "Fall of Grobb" event, which took players by surprise. One night, players logged in and saw a full scale invasion of Frogloks into the Troll home city of Grobb. Players quickly gathered into groups to either help the Frogloks or the Trolls. The team watched the whole thing on a big screen TV until 1AM, when the last city fell. This event had a permanent effect on the world; Trolls now start in the Dark Elf city of Neriak and players fondly remember their old days in Grobb.

In addition to keeping the game running and the constant live updates, the EVERQUEST team has to deliver two full expansions a year. These expansions are not just new zones with a few quests added. They are often technologically risky and call for in-depth planning to ensure they ship on time.

Design for an expansion starts about a month before the last one ships. At this point, the team puts together a big list of ideas that they think would be fun (all the



▲
An EVERQUEST Fan Faire, where online friends meet in the real world.

Dos and Don'ts For Creating an MMO

MAKING AN MMO IS THE BERMUDA Triangle of game development. It's very easy to waste money, given that these games are already huge. It can take more time than normal to realize your game is going down the wrong track.

1.) DO KNOW WHAT YOU'RE BUILDING.

"It's EVERQUEST, but set in the Russian Civil War" is not a design document; it's a roadmap to disaster. It's great to use other games as idea factories for your game, but don't use them as a template. If you don't know the reason why there are raid level encounters in EVERQUEST, then don't

have them in your design. If you don't know why food and drink make you hungry in the game, then remove it for yours. Every design should have its own soul and it's your job to define it. It helps to have a small team for as long as possible to achieve this aim.

2.) DON'T BUILD UP YOUR TEAM TOO EARLY.

MMOs typically have long development cycles. You will be tempted to hire on artists and designers early. Don't. Until your pipeline is solid and you can actually put in content in the game from start to finish, you have no need for anyone beyond lead

artists and designers. Again, small teams are your friend for the first year of the title. I would run with less than 10 people for the first year of MMO development unless it's an established game engine or expansion.

3.) DO PAY ATTENTION TO YOUR DATABASE CHOICES.

Database fees can add up very quickly. Do you need the Rolls Royce of databases or will a free platform do just as well? What about flat files? Think long and hard about this. Never believe a database company that tells you they have a black box solution and that "banks use our system and

they are much harder on them than games."

4.) DO PAY ATTENTION TO YOUR SERVER PLATFORM AND COSTS.

Are you going to co-locate your servers at a NAP or locate them at your office? Are your servers going to use Unix or Windows? Everyone in the telecom business will shriek in horror at the idea of Windows, but it's your game. Are your programmers more comfortable with Windows coding or Unix/Linux? Avoid big box solutions; lots of small boxes are usually better than one big expensive one.

—Rod Humble



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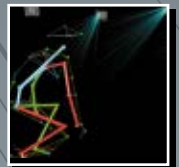
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VICON MOTION SYSTEMS

INSIDE EVERQUEST



team members play EVERQUEST regularly). The full feature list is decided before the release of the previous expansion so work can begin immediately.

Each expansion has to have a feature that appeals to each of EVERQUEST's constituencies. They are:

- High-level content: for players who simply have achieved everything they can in the game and are in need of more and harder content.
- Large guild content: encounters that require dozens of people to beat.
- Solo content: activities that can be completed by one persona alone.
- Casual content: mid- to low-level content that can be completed by a player who only plays an hour or two a week.
- Newbie content: EVERQUEST sees a constant influx of new players and we put content into each expansion aimed at the new player.
- General features: something that everyone can enjoy, a new class, new technology, new feature, and so forth.

If EVERQUEST were a truly stable platform, expansions would be much easier to create. However, we are constantly changing the game's technology to keep it fresh and interesting. In LOST DUNGEONS OF NORRATH, we added the concept of instanced dungeons, which required a radical alteration to the way our server code worked. This potentially could have introduced hundreds of bugs into the live game.

The worst technology changes are the complete rewrites of the graphics engine. We have now rewritten EVERQUEST's graphics engine twice since launch in 1999. This is somewhat like replacing the engine of a Formula 1 car while it is still racing around the track. These were hard decisions to make, but they were made in the belief that EVERQUEST will be around for years to come and needs to be kept up to

date to compete. So far that assumption has been proven correct.

Given that there is no pause between expansions and we always have to be adding to the live game, it's easy to slip into permanent crunch mode. There is literally no quiet time of the year for EVERQUEST. To help overcome this high pressure environment, we have learned a few tricks along the way.

Robert Pfister, senior producer on EVERQUEST, regularly implements "I don't care if you go home, but you can't stay here" reigns of terror on the team. This involves escorting people who are working late out of the building. While the vision may seem entertaining, our experience has been that a solid professional eight hours a day delivers you far greater productivity than someone who works 14 hours a day every day. Team members find it easy to slip into longer and longer work hours. For their own good, you have to reset their work schedule occasionally.

Along similar lines, the Studio has a strict work hours policy. Everybody gets into work by 10AM: you can get in earlier and leave earlier, but you cannot come in any later. This policy met with a lot of resistance initially, but without it, our productivity was much lower. Many developers prefer to work late and get into work later. Sadly, in a project like EVERQUEST, people need to work with each other and it's essential to have the team together for the bulk of the day. 10AM was the latest we could possibly go and still have people with kids who got up early and single people who stayed up late interact together on a daily basis. This policy acts as a nice remedy to self-imposed crunch. If you know you have to be back at work by 10AM, you are less likely to work till 4AM everyday. This keeps team members fresher and increases the quality of work dramatically, for programmers in particular. It's our experience that



The Sol Ro fight from EVERQUEST.

LOST IN LOCALIZATION?

*No, I'm not dead!

Where is the
command
center?

Nein, ich bin
nicht
gestorben!*



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Concept art for EverQuest's Kunark.

late night crunch introduces so many bugs as to make the work almost worthless in the long run.

However, even with the best of intentions, features and work can slip. To ensure this doesn't affect the release date, we now carefully insure that every large feature is not interdependent on another. When we released the SHADOWS OF LUCLIN expansion, the new graphics engine was required to be complete in order for the expansion to work. This led to some of the ugliest crunching I have ever seen and a terribly buggy launch. Truth be told, the morning of the day SHADOWS OF LUCLIN hit the store shelves, the expansion simply did not work, and bugs were being fixed literally minutes before we were scheduled to open up the servers. That's cutting it a little bit too close.

With GATES OF DISCORD, we carefully divorced the new graphics engine from the rest of the expansion. This gave us the flexibility to separate the graphics engine upgrade from the expansion launch itself, which turned out to be necessary. For every feature or new design element, asking "How can we launch without this?" is a good habit to get into so backup plans are always there.

EVERQUEST is part of Sony Online Entertainment Studio 1. Although the EVERQUEST team numbers around 50, there are around 160 people in Studio 1 working on EVERQUEST II and EVERQUEST ONLINE ADVENTURES, as well as managing some external third party titles. Being part

of a large studio gives many advantages in times of crisis. Just about everyone within the studio has, at one point or another, worked on EVERQUEST, so they can be drafted at a moment's notice to pitch in. Having the programmer who wrote the original EVERQUEST graphics engine available or drafting six artists to help an animation crunch is a huge asset to the team. It is doubtful any of the projects in the studio would be as successful as they are without the benefit of this available pool of support.

THE BUSINESS OF SUBSCRIPTION GAMING.

WHEN MAKING SUBSPACE AT VIRGIN INTERACTIVE,

I had a rare glimpse into the true scale of piracy. SUBSPACE was an unusual game at launch, in that it was a retail SKU that had to be played online and on our servers. We could also detect which copies were legitimate and which were pirated. This unique position of data gathering gave us a surprising result. For every one copy we sold, seven people pirated it. In addition, there was no difference in usage between those who stole the game and those who bought it—if anything, those who stole it played more. This was back in 1997 and it's hard to imagine that with broadband Internet connections now common place that piracy number has gone down; it's more likely it's gone up. After seeing that data, I knew I was going to be in the online gaming subscription business if I wanted to make PC games. So now imagine a world without piracy: Multiply all your PC sales figures by at least seven. Sound attractive?

Now consider the benefits of a steady revenue stream. Instead of the boom-and-bust cycle of retail releases, consider how much better you could run your business if people actually paid you when they played your game, even if that was years after release. This is what a monthly subscription fee buys you.

The creative benefits of subscription gaming are even greater. Not only can you fight back against cheating, you can count on new emergent behavior as you use old game mechanics in the context of an online world. Creatively, the world of online gaming has massive room for growth. It's somewhat depressing that many folk seem to think that online gaming mechanics are only EVERQUEST's mechanics. This is a tragic mistake, since online gaming isn't a genre; it's a platform that can hold many genres within it.

These factors are the reason Sony Online Enter-

Why Is EVERQUEST So Damn Compelling?

THE LURE OF EVERQUEST includes much more than a character to advance, a world to explore, or a game to play. How can one game absorb so many people so often? The answer is simple: it's all about meeting friends, building relationships, and then killing critters together. But don't bother trying to tell that to the people who play—they'll tell

you it's about their next level, or some new powerful spell, or maybe it's the epic quest that they are this close to completing. They meet new people, they share the experience of discovering new and magical places, they work to solve puzzles and quests together, they wield powerful magic to overcome obstacles,

they build each other up to new levels, they rely upon their friends for help, and their friends rely upon them. Together, it all feels good, and that's why every day, hundreds of thousands of people are drawn together to this online world.

—John Donham,
Director of Development

tainment exists. To us, online subscription gaming has such obvious benefits from a business, as well as creative, point of view, that it represents a good part of the future of gaming.

Unfortunately, there is also bad news. Subscription gaming is hard and expensive. The hard part of development is covered above. Several online games have died in recent years because they have let one of the three balls drop that you need to juggle. Reliable service, constant free updates to your game, and regular expansions and retail SKUs to keep the game's buzz alive and bring in new customers. But there are other factors as well.

EVERQUEST spends heavily on customer service. We operate 24-hour help both in game and out of game. Each EVERQUEST Games Master (GM) can go into the game and reimburse items or run live events for players to enjoy. More important, GMs act as cops on the beat within the game, trying to ensure that everyone plays nice. This is a thankless task, but a necessary one, as online gamers know there are a lot of idiots out there whose sole purpose in life is to ruin other people's fun. Having people on the ground in the game isn't a perfect solution, but it's the best we have come up with so far.

Gaming is now international. If you don't translate your product into other languages, you're handicapping a large portion of your sales. Simultaneous releases are also

becoming a requirement. Given that each EVERQUEST expansion creates nearly six novels worth of text to be translated, it has been a challenge to get our international efforts up and running. Originally, EVERQUEST was built by talented developers crunching to get an English language game done and they used every trick to get it completed. Some of those tricks made localizing EVERQUEST exceedingly difficult. For example, EVERQUEST has a scripting language, its called "English." No, really. NPCs speak phrases that can trigger behaviors in other NPCs if they overhear them. If these phrases don't match, the behavior changes. Naturally the phrases appear in two different places, so mistranslations lead to bugs.

International Ops was initially a part of product development. Quickly, we saw it was a massive task and it has now grown to be a separate department of six people. They manage the constant flow of translations and have coders on staff who can modify the EVERQUEST source as needed to get each country's version working. We still have not hit the ideal of simultaneous launches across all territories, as there is still a turnaround time to get all the text translated for each expansion. We are still looking at ways to speed this process up.

EVERQUEST runs on 47 servers (at the time of this writing), which requires



Being the Mayor

MANAGING EVERQUEST, WE

often feel like the mayor of the place, since the game operates a lot like a medium-sized city. It has an infrastructure, a political system, an economic system; it has holidays, geography, and events. It has laws that are enforced, even its own type of health and safety system. And most important of all, it has a population. People live there, they elect representatives, they perform their jobs, they make new friends and stay in touch with old ones. The population of EVERQUEST rivals that of cities like New Orleans, Las Vegas, and Cleveland; it's higher than Atlanta, Kansas

City, Omaha, Miami, or St. Louis.

From the 2000 Census, EVERQUEST would be the 35th largest city in the U.S., between Long Beach, Calif. and Albuquerque, New Mexico. Like any big city, we have our good days and bad days, but overall people stay here, they meet here, they even get married here. Now, if you think of each server as being a state of sorts, with a different economy from server to server, different events on each server, different people, different political systems, and so forth, there lies a glimpse of the future of MMOs.

—Robert Pfister,

Senior Producer, EVERQUEST



INSIDE EVERQUEST

hundreds of boxes to run. The monthly bandwidth cost for EVERQUEST alone is staggering. The sting in the tail for launching an MMO is that if you don't have enough hardware at launch, then your game will flop as customers are unable to log in or servers constantly crash due to load. On the other hand, if you overspend, then you have extremely expensive hardware sitting around with no players to fill them. This balancing act is an art that varies from project to project; at SOE, we are fortunate to benefit from the economies of scale, so if one game doesn't use up all its hardware, that hardware can be transferred to another game that needs more servers.

EVERQUEST player data is literally our business. As

such, we have a series of backups that hopefully reduces our risk of losing any. However, nature threw us for a loop last year when the San Diego wildfires got within a few miles of the EVERQUEST server farm. The sight of gas mask-wearing Ops staff racing from the building holding backups and various pieces of expensive equipment is memorable in an "Oh my goodness, we could all be out of a job tomorrow" sort of a way.

It may be a cliché, but with this game in particular, it's very true that EVERQUEST is a team project. The people on the team make the magic happen and it's the senior producer who keeps everything running smoothly. It has been a privilege to watch them work over the years. ❖

The Road Ahead: Developing EVERQUEST II

WORKING ON EVERQUEST II HAS BEEN A long road. The transition to next generation graphics has proven to be extremely difficult for us. The length of time it takes to generate even the most basic art with our next generation engine is six or seven times longer than previous games.

Our other challenge was to pick a design direction that didn't cannibalize from our EVERQUEST user base, but would instead attract new customers or those who quit EVERQUEST some time in the past. The resulting design choice was to make a game more immersive than EVERQUEST. For those who first sat in the Faydark and were enthralled by entering a fantasy world or who couldn't wait to get out and

start roleplaying, EVERQUEST II is a game they will love. We deliberately took a sharp turn away from over-simplifying the game or streamlining the gameplay. We want people to feel they are entering an alternate world, not just playing yet another PC game.

Whether it will pay off or not remains to be seen, but even now, when we are only doing internal testing, every time I log in I have at least one moment where I sit there with my jaw open, staring in amazement at the richness of the world around me, and then the server crashes. That's why we're still holding internal testing.

—Rod Humble



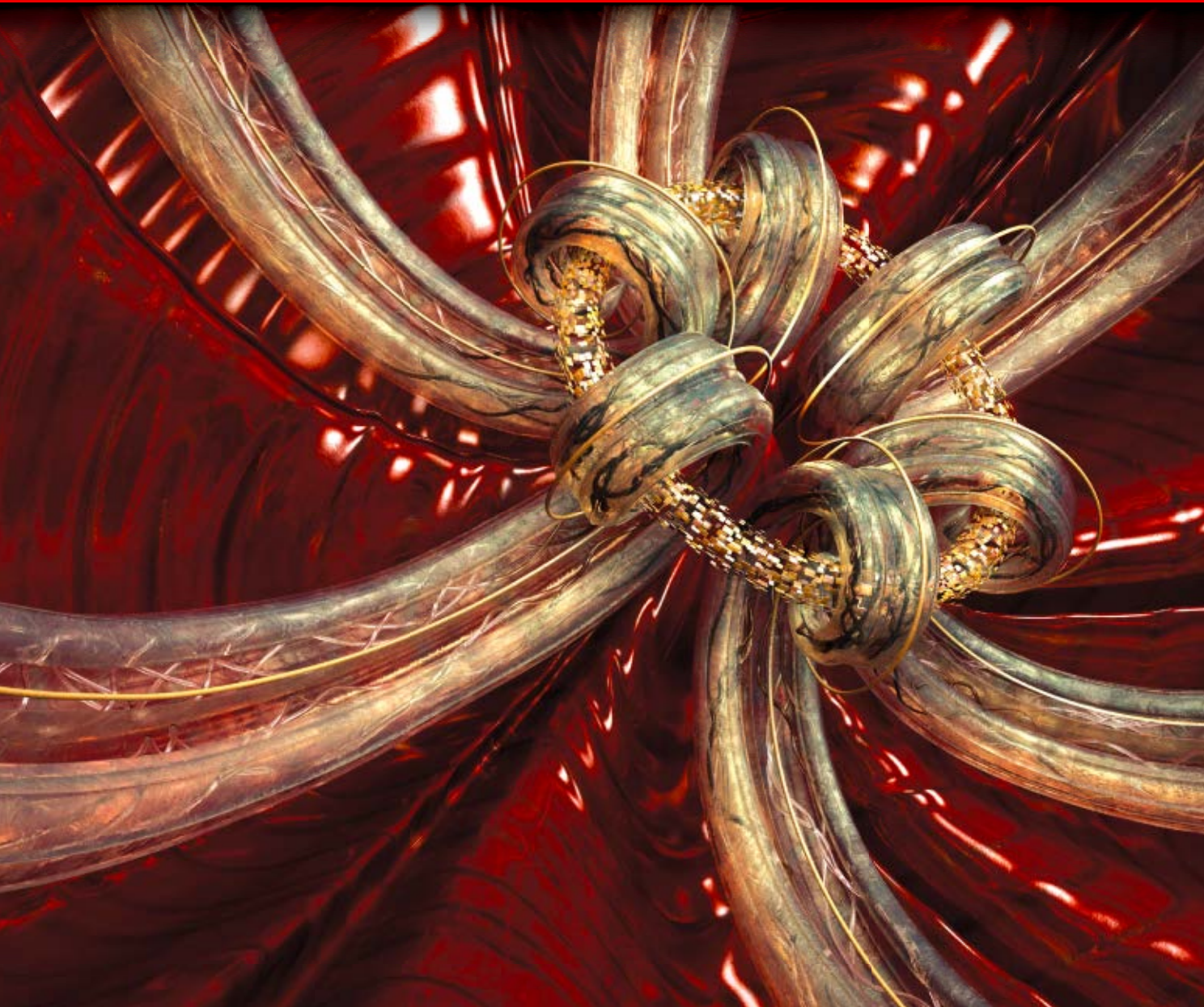
▲ A Dryad from EVERQUEST II.



▶ A party assembles in EVERQUEST II.

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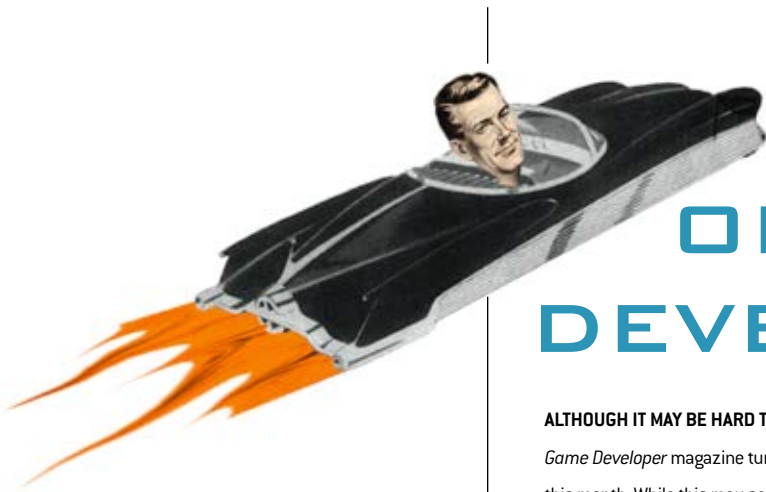
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THE NEXT 10 YEARS OF GAME DEVELOPMENT



Illustrations by Steve Munday



ALTHOUGH IT MAY BE HARD TO BELIEVE,

Game Developer magazine turns 10 years old this month. While this may seem like a perfect opportunity to indulge in a sepia-tinted stroll down memory lane, we covered that ground with *Titanic* subtlety in our recent 100th issue. Instead, as we consider what the next 10 years of postmortems, columns, and features might look like, our gaze naturally turns to what the next decade of game development itself might look like.

A wise green fellow once pointed out that “always in motion is the future.” However, there

are several industry veterans who have successfully weathered market cycles and generation transitions, and industry leaders who have demonstrated a keen sense of prescient awareness, who seem better qualified than most to give us all a sense of what’s coming next. To that end, we asked a cross-section of them to look into their collective crystal ball, and tell us where the next technical and conceptual breakthroughs are likely to come from, what the development landscape will look like, and where gaming will go over the next 10 years.

Developers experienced a revolution a few years ago when 2D representation gave way to real-time 3D. There is no 4D out there, so we might be forgiven to think the revolution is over, and from now on it’s just a matter of tying up loose ends. And maybe that’s true.

However, hardware people want to sell upgrades, and they need a breakthrough. Here’s what I think it will be: real-time language production combined with real-time speech synthesis. Both are tough nuts that will require hot hardware and software to crack, and they will liberate game design like nothing before. Instead of writing scripts, I’ll massage data in some expert system and, lo, my characters will talk and react on their own. Suddenly, mere social discourse will actually be interesting. Something besides brutal combat may get gamers’ attention. Will this happen sooner or later? Ahh, the big question.

I’m betting sooner. Who needs a 5GHz processor to run Word?

—Hal Barwood, *Finite Arts*

Today, we are locked into a TV and console model of gaming. I see the industry developing completely new styles of play that break that model. One example is connecting the GameCube to the Game Boy Advance, which amounts to a new style of game.

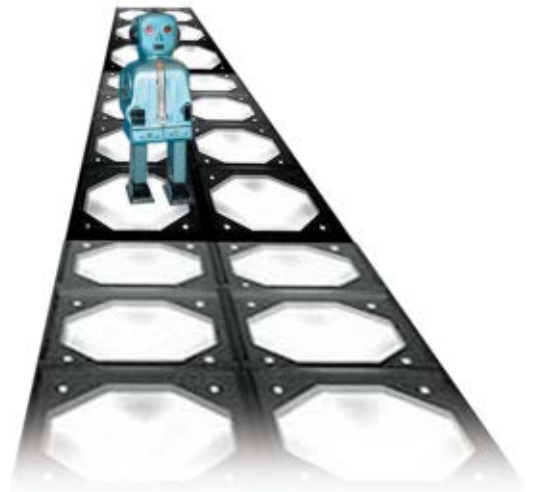
As for development, hardware tends to push technology, but the team sizes are also growing. For *THE LEGEND OF ZELDA: THE WIND WAKER*, we had a huge staff, with escalating costs. Successful companies in the future will meet the challenge to find ways to work with shorter time frames, and develop more innovative titles. It’s a struggle to make a game new and refreshing. Take the example of *ZELDA*. New gamers come into the franchise, and we have to maintain interest by continuing to innovate. Hopefully *ZELDA* will still be around in 10 years so I can use that as my answer!

—Eiji Aonuma, *Deputy Manager, EAD, Nintendo Co., Ltd.*

By 2014, we will be building games for the next-gen systems. These will be 100 to 150 times as powerful as this generation of PlayStation 2, Xbox, and GameCube, with more RAM and polygon performance than today’s designers can imagine. I’ve been working on games for more than 20 years, and frankly, I’m finding it difficult to imagine what to do with so much power.

I predict that our industry will turn to Generation D, the digital kids now in high schools and colleges around the world. These kids have grown up always digital, and have formed their tastes and personalities on the Internet, cell phones, and videogames, with new kinds of time shifting and communication via TiVo, AIM, Friendster-socializing, and e-commerce. Their energy and instincts will reinvent interactive entertainment.

—Bing Gordon, *Co-founder and Chief Creative Officer, Electronic Arts*



I see online console gaming leading to a huge surge in user-generated content, certainly by the next generations of consoles. In fact, already, the best minds in the industry are interested in concepts that foster online communities faster, such as downloadable and, more important, uploadable content, rather than limiting their focus to straight head-to-head play. The first companies with a successful approach to user-generated content on the console, rather than the PC, will define the next generation. This trend also has wider implications as gaming becomes more and more of a compelling use of an individual's time—driven by the interactive and immersive experience it provides—meaning, gaming will continue its drive toward being the center piece of multi-functional consumer devices.

Conceptually, I see changing the way people interact with games, through the use of sight and sound, as being a huge focus. For example, the EyeToy USB Camera points the way forward in terms of how new technology can completely redefine the gaming interface—which is for some people still a big barrier to entry. With EyeToy, we are attracting new gamers who previously didn't participate in gaming because they didn't have the time to invest in learning how to interact with games [conventional controllers and lots of buttons]. Through the integration of such second-nature interactions as sight and sound, the walls come down and a new market of consumers become engaged. And not only will technology like EyeToy change the interface for competitive games, it provides a huge creative pallet for the development community to explore new modes of games that were not possible with a standard interface.

I also see wireless technology as a huge focus—in the coming years a whole generation of gamers will come to expect connectivity as standard. This trend has huge implications for game design and modes of play—wireless technology provides an endless array of possibilities.

In terms of the development landscape, given the continued growth of the industry, it's safe to assume that game development will become more expensive. However, the ability of developers/publishers to manage their game portfolios and franchises across a greater product lifecycle [for example, the PlayStation is entering its 10th year, and we plan to achieve the same with PlayStation 2] should, we hope, more than offset the increased cost of production. Not to mention, with continued growth comes a larger audience—and a greater audience to whom to market content.

—Andrew House, Executive Vice President, Sony Computer Entertainment America

The next technical breakthrough certainly sounds like it's going to be XNA. If XNA does what Microsoft says it will, it will be a major breakthrough. As for a conceptual breakthrough, in the MMO space, it could be the first truly successful mass market pay-for-play MMOG. In terms of the development landscape, I think it will be pretty bleak for independent developers. The growing consolidation of power in the hands of a few major publishers combined with the rising costs of game development, will make it very hard for independent developers to exist. In terms of gaming itself, we'll see less in terms of hardware breakthroughs in the second half of the decade than we'll see in the first. I also expect we'll see continued growth of the consoles and a slowdown in the growth of PC-only games. We'll also see the trend of using licensed products continue to explode.

—Mark Jacobs, President and CEO of Mythic Entertainment

the future of game developer magazine





If games are really going to reach their potential as an art and entertainment medium over the next 10 or 20 years, we have to focus on characters, emotions, and drama, and we have to do it in a way that embraces interactivity, since it is the key differentiator between games and other art forms. Having amazing characters and dramatic tension in your cutscenes, but having the interactive sequences of your game be just another button-mashing fighting or shooting game is just worthless—go make movies if that satisfies you.

Really embracing interactivity means developing a ton of technology over the next 10 years. We currently have no idea how to write code that manages a player's dramatic arc through a non-linear story. We have very little idea how to write subtle NPC AI that tailors itself to the player's behavior to ensure he or she is having the kind of experience the designer intends. We don't even have a model of what kind of experience the players are currently having while they're in the game—are they bored, overly challenged, or what? I think in the future there will be subsystems in games that watch and gather data at runtime to make a constantly updated player model. Then other systems, like a drama manager, will query the player model and make decisions about how to shape the game to increase or decrease tension, and so forth. These systems are risky; both in the sense that they're unknown technical research problems, and also in that they make designing games harder than if you're doing linear "theme park rides." But the potential is there for truly interactive dramatic stories that empower the player. We have to stop calcifying with sequels and gameplay rehashes and go for it.

—Chris Hecker, *definition six*

We believe fundamentally that software will define the next-generation of videogames. That's what XNA is all about. XNA is our next generation development platform that equips developers to deliver breakthrough games while combating rising production costs and ever-increasing hardware complexity.

During the past 10 years, developers have continually demanded a better way to make games. Our focus on software will provide them with continual innovation now, and for the next 10 years. We created innovative development tools in the past with DirectX and Visual Studio for Windows and with XNA we are taking our commitment to the next level.

Designers have always been inspired to deliver on new ideas but they've also been limited by technology, tradeoffs, tight schedules, and price tags. The XNA software development platform makes working with cutting edge hardware easier, allowing developers to focus on game design, not nuts and bolts boilerplate coding. We're tremendously excited about the industry's potential for the next 10 years, as developers spend less time worrying about the limitations and more on the possibilities.

—Shane Kim, *General Manager of Microsoft Game Studios*

I think the display (monitor) will change. It's been more than 20 years since games were introduced on traditional CRT (TV-type) displays. In the future, the display-type will go beyond TV.

The development landscape is changing and middleware, the technology between hardware and software, is going to play a more important role in the industry. Excellent middleware helps game developers focus on creating the game content itself. As you can now see in today's business, game development is becoming more and more specialized like the movie business.

In the coming years, gaming will play a larger role in art and culture. As this role increases, so too will the level of critical evaluation of game products and technologies. I'm hoping games will be valued as the film or fine arts industries.

—Yuji Naka, *Senior Corporate Officer, Sega Corp. / President & CEO, Sonicteam, Ltd.*



The last 10 years of gaming have seen incredible progress and evolution. The next 10 years promise even more technological feats that will continue to impress and redefine our industry. However, the biggest improvements that we will see have nothing to do with technology or specific hardware platforms. Sometime in the next 10 years, we will finally see a game that creates a truly interactive story. This game will be compelling and creatively rewarding for the player, yet still allow designers to craft an experience that has all of the conventional elements of good storytelling. It will be a watershed event in our industry.

The phrase "interactive story" is something of an oxymoron. Crafting a compelling, artistic, and purposeful story is hard enough in the non-interactive world. It's damned impossible in our world where we want players to interact with the world and drive the story. Advances in technology will render relatively simple problems like dynamic speech synthesis and content creation moot. As we start to topple those mountains, we'll end up directing our energies into areas that aren't about polygons or bandwidth.

Most games, to date, have been visceral experiences based around competition or singular optimization. There's been the occasional game that allows somewhat open-ended gameplay, but even those are rare and open-ended is still bounded by whatever the game designers thought players might do. Those games will always have their place, but our industry needs to strive for more complex things as well. Think of it as our version of Maslow's Hierarchy.

— Dave Pottinger, Development Manager, Ensemble Studios



I think three major trends are going to influence the interactive

entertainment industry over the next 10 years. The first trend will be that improvements in the technology and design of simulations—AI, emergent behavior, physics, economies of value—will make their way into all genres of games in some form or another, leading to more immersive game experiences and increasing the need for computation power.

The second trend will be the rise in importance of the casual gamer and of women as game consumers. This trend will drive the explosive growth of wireless gaming, online gaming, and potentially interactive TV. It may even change the mix of games made for traditional consoles and PCs, as the current audience ages and starts looking for more accessible games.

The third trend will be the globalization of the games business. New markets for games will open in China, India, and other rapidly-developing countries, and local developers will emerge to exploit local tastes. Globalization could be disruptive for the incumbent publishers, whose packaged-goods mentality (and associated fear of piracy) has kept them out of emerging markets, allowing companies like NCSoft in Korea and Shanda in China to create valuable online game communities.

— Mitch Lasky, CEO, Jamdat Mobile

I think the next technical breakthroughs will come from

massively multiplayer online games. This will become even more interesting as interactive entertainment merges with Hollywood-style cinematic elements—a new style of entertainment.

The development landscape is bound to get more efficient, as the game industry seeks new markets and industries with which to collaborate.

The interactivity of games will merge with toys, live entertainment, and home electronics including cell phones. This convergence, and the "play" itself, will become borderless.

— Yu Suzuki, Officer, Sega Corp. / President & CEO, digitalrex

One of the largest

problems we face as developers today is the increased expectations from our players that lead to "content explosions." For most game designs today there seems to be a linear relationship between the amount of content we need to produce for a game and the amount of "play space" within a game. In other words to provide the player with twice as many possibilities or twice the gameplay we need to produce twice as much content. We need to decouple these curves so that we can provide four times the gameplay when we double the content.

This line of reasoning has led me to a strong interest in the idea of algorithmic content generation. You can take any form of content (models, music, animation, text) and then start to imagine technologies that would allow you to generate this stuff on-the-fly. Of course certain content types are much easier to generate than others, but as we develop these abilities entirely new, unexplored game possibilities open up for us.

— Will Wright, Reverse Social Engineer, Maxis





THE ANTI-COMMUNIST

JASON RUBIN, PRESIDENT AND CO-FOUNDER of Naughty Dog, threw down the gauntlet at the 2004 D.I.C.E. Summit in Las Vegas in early March, when he challenged the industry to value the talent of individual developers instead of grouping studios as faceless teams. While some have observed a disparity between the way the film industry regards its celebrities and the more timid approach the game industry takes toward its creative talent, few have presented their research as dramatically and as forcefully as Rubin.

Using the invitation of pop icons to game premieres as a jumping off point, Rubin projected his developers' manifesto onto a screen more accustomed to reflecting convergence charts and character models. He passionately argued for developers to seek help in promoting themselves, to take advantage of the collective bargaining power of agents, and inject themselves into the mainstream consciousness as the artists behind the entertainment medium that pundits consider the new opiate of the masses.

Rubin pointed out a strong connection between the gaming industry of today and the film industry of the 1950s, in which celebrities were still beholden to ironclad studio-specific contracts. Those film stars banded together, and talent forced a change that led to the system in place today, where stars, directors, writers, and everyone involved in producing the film are now free to work on whichever studio's project they see fit.

Given the research, passion, and direct action Rubin has brought to bear on this issue, coupled with the strange mixture of a standing ovation followed by muttered grumbles between the slot machines, we had to explore this further with him.

GD: *What steps can a studio take to promote the names of one or two of their key developers?*

JR: Certainly the first step is to identify those key developers. Many development studios still adhere to the egalitarian, yet impractical, view that they can market the team as a whole instead of the directors that run it. The media is interested in people, however, not teams. You cannot interview "Naughty Dog," you have to interview a person. It is the personal story that makes the article interesting. Failure to focus on individuals when doing publicity for the team is a good way to make sure that the publicity never happens. Additionally, the team is not comprised of equals. Although I would never want to lose any of my

MANIFESTO

incredibly talented artists or programmers, I would rather have one of them quit than my game director. The previous is unfortunate, the latter is a catastrophe. This difference in value must be accepted.

Once the key personnel is selected, it is up to the team to make it clear to the publisher that they believe publicity for these team members is as important to their future as the dollars they receive for making the game. The fact that I have incessantly pushed myself and my partner Andy in front of the camera should not be mistaken for vanity. Of course I have to make great games, but there is also a connection between my notoriety and Naughty Dog's game sales. This in turn means I have more to spend on bonuses, so the process increases the income of all the people I work with. Steven Spielberg does not do makeup or camera work. He is not solely responsible for the product he makes, and certainly I am not either. But there is an acceptance in Hollywood that he is going to be the name on the box and in front of the press, and that that helps everybody he works with. We need to get there.

What shocks me is that many talented game directors in our industry don't see this connection. They sign on for a high paying, and very comfortable, position inside a publisher. But if a director does this at the expense of self publicity then they are tilting their long term earning potential downward. The publisher is paying them well so that they can apply the value they create to the publisher "brand" instead of the individual. Frankly, I don't believe publisher brand can mean any more in the videogame industry than it does in Hollywood. Universal Pictures has always published everything from crap to cream movies; Vivendi Universal will always publish everything from crap to cream games. But it is certain that when the unknown directors try to get a better gig they won't be able to compete against those that fought all along for publicity.

GD: *How far can we take the Hollywood analogy before it breaks down? For example, we may have Spielbergs in the industry, but our Tom Hanks is Maria, IP owned by a publisher. Besides the project lead, who are good candidates for celebrity status?*

JR: I don't think the Hollywood analogy breaks down. The game director who made *RISE TO HONOR* is no less important than the director of a *Jet Li* movie. There is very little difference between *Shrek* and *Lara Croft*.

This is especially true if the *Lara Croft* game paid a top actor to voice her. In fact, *Lara Croft* is a perfect example because she has been in both movies and games. I know more about the director of the movies than I do about the game creators—and games are my industry.

Each product is different, but I see the game director, the art director, the producers, and the programming director as obvious, though not exclusive, choices. If the game is heavy in art, then maybe it is only the art



▲
Uncredited developers absorbing Rubin's anti-communist manifesto.

director. On a game that is all about technology, then maybe it is the programming director. The important point is that having live talent in the product vs. inanimate characters does not lessen the value of those that put the product together.

GD: *Name brand talent are still asked to create sequels with limited budgets instead of creating ambitious new games. What's missing from this picture?*

JR: There is often value in sequels for all involved, and certainly I have chosen to make a few. The key word is "chosen." The question is why other top talent are not calling the shots in our industry. In Hollywood up and coming directors are project takers and top talent are project makers. If the up and coming director shows his or her skills in making successful pictures, then he or she is sought after and get to pick projects to work on. Too many misses for top talent and they find themselves taking the projects they are given.

The bottom line is that our industry works that way as well, but many developers don't have the confidence, negotiating skills, or notoriety (see above) to make it happen for themselves even after multiple successes. If you are a developer that has significant success in your past and you find yourself unable to pick your projects, then you need to accept that you are doing something wrong. If you are working inside a publisher, then you need to get the guts to break free. Too many developers take no for an answer. I never did. Finding a good agent can give you confidence, opportunity, and someone to push your name at the same time.

disclosure started?

JR: I am sure it is "confidential" what top Hollywood talent gets per project, yet a week after signing even I know what they make. Isn't it convenient how information that would help the developer is considered strictly "confidential," while information that helps the publisher is "needed to conclude the transaction"? We must change this paradigm. Certainly having an agent that represents significant numbers of developers gets us around this roadblock. Are they not allowed to use what they know?

GD: *Beyond getting the names of the talent on the box, how can creative talent be promoted to the mainstream consumer? Does this mean doing The Daily Show with Jon Stewart when a game premieres?*

JR: Ideally, game talent would be doing Jon Stewart's show, but we have a long way to go. There was a period when game publishers felt it was in their interest to publicize developers. EA was founded on this principle. Andy and I had our photos on the two products we did for EA in the early 1990s. Photos! Publishers have certainly changed their tune. The picture they are painting of game industry is that the Publishers take select franchises and properties, add their valued branding and marketing talent, and then have the videogames developed in factories. Jon Stewart doesn't interview factory workers.

The road to Jon Stewart starts with agents and publicity firms looking out for the long term interests of the developer, not the specific product. Radical thinking, yes, but it is time. The argument is continually made by publishers that personal publicity compromises the product's publicity. Funny that it doesn't in Hollywood. If working internally at a publisher prevents a developer from hiring this type of help then the costs of that loss must be weighed against the benefits of the position. Five years from now if two developers go looking for non-game-industry funding, the one who was on Jon Stewart is going to have an easier time finding it.

GD: *How do you strike the right balance between being celebrity talent and a representative of the talent of the team?*

JR: I am always clear that the projects I work on require the talents of everybody involved. If the interviewer comments about a specific element of the title, then I mention the person or persons most responsible for that element so that the interviewer knows that I give credit where credit is due. I always try to mention the name of Naughty Dog's game director, art director, creative director, and programming director. I do the best I can do, but inevitably the question "how did you get into videogames" will be asked. I can't tell 65 stories. I tell my own, and I don't feel guilty for doing it.

GD: *What games are you playing now?*

JR: NFS: UNDERGROUND. They did a great job with the feeling of speed, and I just can't stop collecting upgrades. My goal is to create the ugliest "Frankenstein" car possible. I just wish I knew more about the developer...

NOTE: Ruben announced his departure from Naughty Dog as we were going to press, and he was unavailable for comment. ❖



▲
Rubin wags his finger at publishers who value pop celebrities above developer talent.

GD: *Once a studio establishes its individual talents, and a higher budget, how can it prevent pricing itself out of the market?*

JR: Unless a developer is unreasonable about their worth, they cannot price themselves out of the market. On the flipside, unless a developer is realistic about their worth they cannot garner the maximum amount possible for their creativity. As in Hollywood it is all a

question of risk and potential. If a developer proves itself consistently capable of on-time launches, kept budgets, and large unit sales, then the publisher (or whoever funds the project) knows that they are taking less risk and are more likely to have great success on the project. To purchase that reduced risk and increased chance of a hit the publisher pays the developer more. The line delineating how much is "fair" is always moving. The fair amount, however, is more than every single developer, including Naughty Dog, presently gets. Publishers have hidden the talent behind successful games behind their "brands" for so long that even they don't know taker talent from maker talent.

GD: *You and others have called for an open disclosure of budgets, so that developers can negotiate with publicly available objective standards. However, publishers often consider that information confidential. How do we get that open*

>> first person

"I THINK JASON'S PRESENTATION had a lot of very valid points. There's no doubt that developers add the majority of value. I think Jason's support for developers will help us achieve our goal to have fair and reasonable contracts with our publishers."

Ron Moravec, COO,
Relic Entertainment

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POSTMORTEM POSTMORTEM

THE GAME DESIGN OF SURREAL'S THE SUFFERING

"A STYLIZED HORROR SHOOTER. THE FRENETIC gameplay of *DEVIL MAY CRY* meets the horror setting of *RESIDENT EVIL* and the immersive game-world of *HALF-LIFE*."

So began the two-page pitch document that marked the start of Surreal's development of *THE SUFFERING*. It is odd to read it now, two and a quarter years after it was written, especially given the various twists and turns the game took along its road to completion. But it is even more remarkable how little the game's concept changed from the basics laid out in that initial document.

Like most projects *THE SUFFERING* had many of the classic successes and failures with which long-time readers of *Game Developer* postmortems will be keenly familiar. Though *THE SUFFERING* employs many game mechanics that are well established (it is a shooter after all) a number of design decisions were made early on that we hoped would make the game stand out. Thus it is interesting to look back on the game's development purely from a game design standpoint to see what worked and what did not.

In many ways, *THE SUFFERING* emerged out of the ashes of a game I had spent the prior two years on, an action/RPG Western called *GUNSLINGER*, a game that ultimately fell prey to the market's aversion to its setting in the old West.

THE SUFFERING was planned from the get-go to be more focused and conservative in what it tried to accomplish than the extremely ambitious *GUNSLINGER*. I realized that in the end part of what

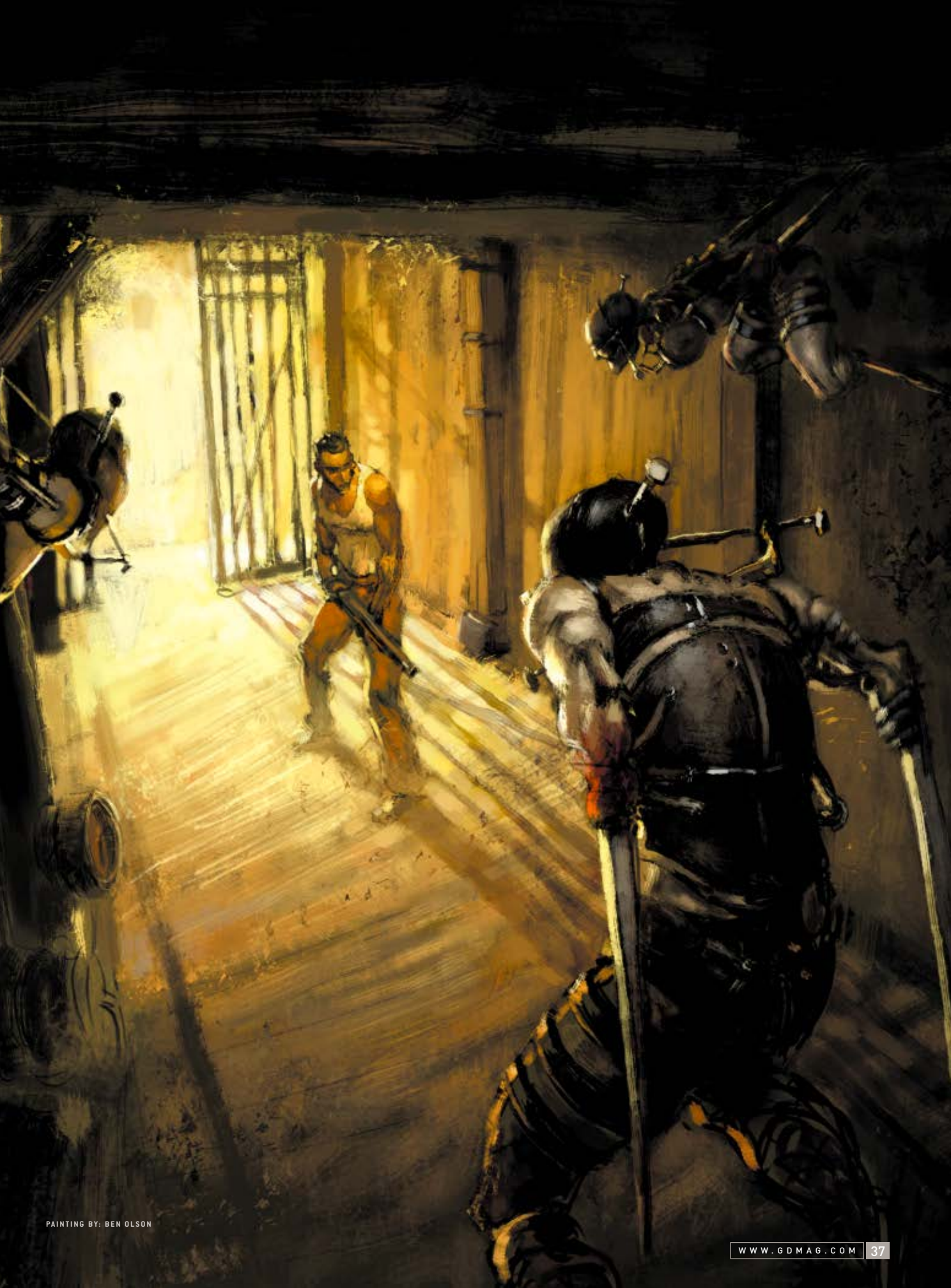
sunk *GUNSLINGER* was its lofty aspirations, and with *THE SUFFERING* we had a game I knew we could pull off, including its drastically stripped down morality system. From the start, however, I had very concrete design goals for the project that I hoped would make it stand out.

Most important was that *THE SUFFERING* was to be an action horror game, instead of a survival horror game. This meant we were going to focus more on combat and avoid the long cut-scenes, frail central characters, clumsy controls, fixed camera angles, and sparse ammo of many console horror games. Losing those elements we knew we would not be able to pull off the cinematic style of horror employed by *SILENT HILL* and *RESIDENT EVIL*, and would need to instead focus on establishing a more disturbing and unsettling tone, taking horror novels as our inspiration instead of films.

We also felt we could be more effective at keeping the player tense and on-edge by immersing them in the game-world as much as possible. In addition to our improved controls and limited cut-scenes, we wanted to immerse the player through player-empowerment. A number of our decisions reflected this: control of the player character would be as smooth and intuitive as possible; the player would be able to interact with the game-world in a believable and consistent way; the player would make their own way through the game-world via multiple paths and numerous optional side-areas; there would be multiple ways to accomplish a given task; players would be able to explore the game's

WRITTEN BY:

RICHARD ROUSE III was project lead, lead designer, and writer on *THE SUFFERING* at Surreal Software. Previously Rouse has tinkered away on a number of titles, including *DRAKAN: THE ANCIENTS' GATES*, *CENTIPEDE 3D*, *DAMAGE INCORPORATED*, and *ODYSSEY: THE LEGEND OF NEMESIS*. Rouse's popular and weighty book about game design and development titled *Game Design: Theory & Practice* was published in 2001, and he is currently working on a second edition. You can reach him at rrouse@gdmag.com.



GAME DATA



PUBLISHER:
Midway

NUMBER OF FULL-TIME DEVELOPERS:
25

NUMBER OF PART-TIME DEVELOPERS:
24 (not including testers or support staff)

NUMBER OF CONTRACTORS:
Three artists, three external art shops, one musician, 12 voice actors, and four motion capture actors

LENGTH OF DEVELOPMENT:
Two years and two months

RELEASE DATE:
March 8, 2004 (U.S. PlayStation 2 and Xbox)

PLATFORMS:
PlayStation 2, Xbox, and PC

DEVELOPMENT HARDWARE:
High-end PCs with Windows 2000 or XP

DEVELOPMENT SOFTWARE USED:
Microsoft Visual Studio .NET, Microsoft SourceSafe, Perforce, ProDG, SN Tuner, PS2 Performance Analyzer, ProView, Photoshop, Maya, Painter, 3DS Max, Sound Forge, CoolEdit Pro, Nuendo, SmartDraw, AC3See, SourceForge, ProblemTracker, Proprietary Level Editor and Modeler

Lessons from GUNSLINGER

WHEN WE FIRST BECAME INTERESTED

in developing *THE SUFFERING*, we felt that we had learned a lot about third person shooting mechanics through *GUNSLINGER*. Looking back on it now it seems much of what we had learned was what not to do. The aiming-based shooting combat that ships in *THE SUFFERING* is nothing like the target-lock based shooting that was in the final iteration of *GUNSLINGER*. Something that carried over more directly was *Gunslinger's* reputation system, but in a drastically simplified form. In *GUNSLINGER* our goal was to

keep track of the player's "good" or "bad" actions and then have the NPCs in the environment react accordingly. This was an incredibly complex system with multiple groups who might view the player's actions differently incorporated with a unique method of distributing knowledge of the player's actions through a town full of people in a believable fashion. (For those interested in the system, Greg Alt wrote an in-depth article about its architecture for the first *AI Game Programming Wisdom* book.)

story as much or as little as they want; and players would be allowed to make important choices about how they act in the game world, thus tying into our morality system. Through these important choices, the player is able to determine the main character Torque's guilt or innocence of the crime that landed him in prison. We felt this was our strongest element of player empowerment, allowing players to determine not only Torque's future but also his past, something altogether unique in games.

Finally, to have a disturbing and unsettling tone we knew that creepy monsters alone would not be enough. Therefore we wanted to tie into real-world horrific events. Thus the storyline is suffused with the darkest elements of American history, including prison life and culture, slavery, racism, unethical medical experimentation, mob-mentality executions, and the death penalty. This is fairly serious subject matter for a videogame, particularly an action-adventure, and it amplified the horror of our world tremendously.

WHAT WENT RIGHT

1. INITIAL CONCEPT. As I have discussed, the initial concept of our game changed relatively little over the course of development. Something about "an action horror game set in a prison" was uniquely compelling to our publisher, the press, and gamers alike. Despite containing highly stylized supernatural creatures, the game's very real-world setting was essential to making the game relevant and hooking people. The game's prison setting proved particularly intriguing to gamers and was a rich space for us to explore that had been under-utilized previously.

Shortly after development started, I wrote a fairly detailed back-story for both the game world (Carnate Island) and Torque, and these elements also changed relatively little over the course of development. Though we did not plan on communicating all of this back-story to the player directly, it gave the game tremendous consistency as we built it. As we were given more time to iterate on the project, the back-story documents gave us a strong foundation on which to expand the game without seeming forced.

2. FOCUS. Having established our high-level design goals from the start, we were then extremely frugal about adding features. We knew

that in order to properly implement the features the game did need, we would have to omit mechanics that were non-essential. For example, beyond his weapons, health, and flashlight batteries, Torque cannot carry any inventory items, including keys. To some, it was odd that we were making a prison game that didn't include using keys to unlock cells and gates. But in the end we realized that including keys didn't really add much if anything to the core gameplay experience and would have been wasted development time.

At the same time, we worked hard to keep the features that enhanced our core gameplay. Our fully-playable first person mode evolved out of a more traditional "look



The earliest concept sketch of the main character, Torque. Artwork by Ben Olson.

around" mode. Over the course of development numerous problems arose and cutting it was suggested numerous times. This feature, however, was a major enhancement to our core gameplay experience, since shooting from the first person perspective is extremely intuitive to players. Indeed, from our gameplay testing we knew this was a very popular feature. Thus we knew that whatever extra time was required to make a fully functional first person mode would be well worth it.

Though we may have been too conservative in a few cases (for example, the game's shooter mechanics would be better off had we included the ability for Torque to crouch), overall our strict policy paid off nicely and allowed us to refine our core features while staying on schedule.

3. CHANGING THE CONTROL SCHEME. Though I said earlier that we stayed remarkably close to our original concept, there is something that changed significantly from our earliest one liner: the game stopped being similar to *DEVIL MAY CRY* (DMC). Indeed, from the very beginning I wasn't much of a fan of the gameplay in DMC and preferred shooters that, at that time, were traditionally more popular on the PC. Indeed, *HALF-LIFE* was also mentioned in our concept for exactly that reason. Truth be told, DMC was mentioned in the pitch because a number of the publishers we were talking with about *THE SUFFERING* had expressed interest in appealing to the fans of DMC.

As a result, from the start our game and level design work had much more in common with *HALF-LIFE* than with DMC, except for our controls. When designing control schemes, I feel that you want to give the user something they are familiar with from other games. In general I find relying on other games for inspiration to be problematic, but in the case of controls I think it is crucial. What we had originally implemented was a target-lock system inspired by *SYPHON FILTER*, the most popular third-person shooter on the PlayStation, and DMC, at the time the most popular third-person shooter

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EVOLUTION OF THE SLAYER

Originally titled "The Cartwheeler," the image on the top left was the first creature sketch we thought had the look we wanted. Mid-development, the creature was reworked to detach his head and make it less androgynous (at the request of our publisher). Artwork and modeling by Ben Olson.

Game	Story	Level	Time/Min	Type	Participant(s)	Description	Moral Rep	P Rep	Max Good	Min Good
1						Deck Battle -> name		33	-26	
4	Story	87a	0:00	Prison Chase	Ernesto, Cash, Muhammad	Death Row Intro				
5	Story	87a	0:04	Blue	Creature	Cell Cell Open				
6	Story	87a	0:05	Creature Show-Off	Catfisher, Guard	Guard Gets In the Head				
7	Gameplay	87a	0:06	New Weapon		Shiv Acquired				
8	Story	87a	0:08	Prison Chase	Guard	Guard Pulled into Veil				
9	Story	87a	0:10	Phone Call	Family - Carmen	RING You have to get out! 12_8301_A_Carmen				
10	Story	87a	0:10	Prison Chase	Guard	Guard Thrown Through Window				
11	Story	87a	0:14	Prison Chase	Prisoner	Prisoner Crushed in Hallway				
12	Story	87a	0:15	Creature Show-Off	Creature, Guard	Bashed Against the Bars				
13	Story	87a		Note		Off to Radio Building				
14	Story	87a	0:20	Creature Intro	Catfisher, Guard	Catfisher Kills Guard				
15	Gameplay	87a	0:20	New Enemy	Catfisher	Catfisher Intro				
16	Story	87a	0:24	Companion Intro	Armed Guard	Armed Guard's in the House				
17	Gameplay	87a	0:24	Companion		Armed Guard				-15
18	Gameplay	87a	0:24	New Weapon		Shield Acquired				
19	Story	87a	0:26	Family EFlash		Dalton's Flash				
20	Gameplay	87a	0:29	New Device		Flashlight Acquired				
21	Story	87a	0:35	Boss Tease/Companion Moment	Horace, Armed Guard	Armed Guard Gets In				15
22	Story	87a	0:36	History EFlash	Horace & Horace	Inferno				
23	Story	87a		Phone Call	Willie	RING				
24	Story	87a	0:36	History EFlash	Horace	In the Chair				-10
200										
200	Gameplay	87b	0:05	Boss Combat		Horse Battle				
210	Story	87b	0:15	Boss Tease	Hannes	In the Gas Chamber				
211	Gameplay	87b	0:20	Phone Call	Hannes	NO RING				
212	Story	87b	0:22	Blue	Family	Return to Deathrow	Y		100	-299
213	Story	87b		Note		Kilroy's Diagnosis				
214	Story	87b	0:25	Prison Chase	Fester	Fester Smashes into Death Row				
215										
216	Gameplay	87c	0:04	New Weapon		Machine Gun Acquired				
217	Story	87c	0:04	Prison Chase	Guards	Harley's Led In				30 -20
218	Story	87c	0:07	Prison Chase	Fester	Fester Smashes Through Guard W				
219	Gameplay	87c	0:15	Puzzle		Use the Radio				
220	Story	87c	0:20	Prison Chase	Fester, Guard	Chained Grenade Guard				-10
221	Gameplay	87c	0:30	Combat Event		Yard Combat Radio				
222						Go to Lighthouse				
223										
224	Story	88a	0:01	Prison Chase	Guard	Guard Gets Shot				-10
225	Gameplay	88a	0:02	Stationary Weapon/Combat Event		Admission Yard				
226	Gameplay	88a	0:09	Puzzle		Get Gates Open				

on the PlayStation 2. With our controls for a console-style shooter but our gameplay from a PC-style shooter, about a year into development we realized we had a dangerous disconnect in our design that made our game tedious instead of fun.

However, by this point MAX PAYNE, HALO, MEDAL OF HONOR: FRONTLINE, and SOCOM had all been released on the consoles and sold in excess of a million copies each. All were shooting based games in the PC tradition: they eschewed target-lock in favor of double-stick control schemes that simulated the mouse/keyboard experience from the PC. This system had the advantage of forcing players to actually aim at their target while having the disadvantage of being challenging for novice players to pick up. But looking at the sales for these titles, we concluded the installed base of players who were familiar with these controls was now large enough that we could take the risk of turning off a few newbies.

The change was a huge success for the game: it fixed the disconnect in our gameplay and added depth that had been completely missing. There was now very little similarity to DMC to be found. Looking at the forums today, I find that some players still have trouble adjusting to the two-stick system, and I believe we have lost some potential players for this reason. However, our significantly deeper game experience has brought in so many players that I know we made the right decision.

4. STORYTELLING TECHNIQUES. THE SUFFERING had a deep story to convey, but we didn't want storytelling to get in the way of our core game experience. With immersion being one of our design goals, we didn't want to rely on too many cut-scenes. We had a rule of thumb that cut-scenes were to be used exclusively for pivotal story points or for intensely scary scenes. Furthermore, we wanted to keep Torque's actions fairly neutral during these

▲ The pacing chart used by the design team to track the flow of major gameplay and story events, as well as how they interact with the player's reputation.

scenes to avoid negating the player's feeling that they were fully in control of Torque at all times. Thus we needed to use different storytelling techniques.

A lot of story was communicated during gameplay through the various NPCs who function as Torque's guides through the world of Carnate Island. Though the player could kill any human character at any time (thus missing out on the story points they had to convey) being in a horror space allowed us to use supernatural characters who Torque was unable to kill. The player could also hear dialog over radios, PA systems, and telephones, all real-time during gameplay. The player was also able to collect various notes throughout the game in addition to unlocking pages in an archive, both of which revealed more of the back-story to players who were interested. Finally, we used a slow-motion blur effect to convey events from Torque's past and the history of the island. Inspired by some of the imagery from Stanley Kubrick's *The Shining*, this technique was our most innovative and also proved to be fairly frightening.

All of these techniques combined to allow us to tell a story with a minimum of play interruption. Players who wanted to experience the story were able to, while those who would rather stick to playing the game could ignore it. Even with these techniques, the story is kept mysterious enough that players will still be left with numerous unanswered questions. My hope is that players will fill in the blanks with their own imagination, following the tradition of great horror films such as *The Birds*, *The Shining*, *The Blair Witch Project*, and *The Ring*. In horror, the player's imagination is far more disturbing than anything a writer could possibly come up with.

5. ITERATION AND GAMEPLAY TESTING. From a design standpoint, one of the most fortunate

events of *THE SUFFERING*'s development was getting time to iterate on the game. Midway was quite happy with the game's progress and had seen a strong reaction to it from the press and public alike. Thus they gave us a generous time extension, not because we were behind schedule but because they wanted to make the game as strong as possible. Thus, with our levels all fully built and functional many months before shipping, we were able to do a number of passes on the game. We did a pass on horror elements to make the game more frightening, including adding our real-time environmental flashes that are so key to the final experience. We also did a story pass, not to change the story but to expand on how it was presented to the player. We performed an AI pass to make the creatures much more dynamic and varied in their behaviors. Finally we did a puzzle pass to fix the most egregious problems with the puzzles. The impact of these passes cannot be underestimated. For example, the game's design did not originally plan for the real-time scenes involving Torque's wife and children to be in the game, since we did not have time to build them from an art standpoint. Anyone who has played *THE SUFFERING* KNOWS how crucial those scenes are to the game experience.

To help us figure out what needed fixing, at numerous points in development we put the game in front of a group of gamers and watched them play and then listened to their feedback. This gameplay testing is distinct from focus testing since these sessions were for development feedback alone, not for marketing use at all. We did this as early as seven months into development, and we were able to fix a lot of major problems early on, including our disjointed control scheme. If anything, the game could have benefited from more gameplay testing, but what we did have time for impacted the game tremendously.

WHAT WENT WRONG

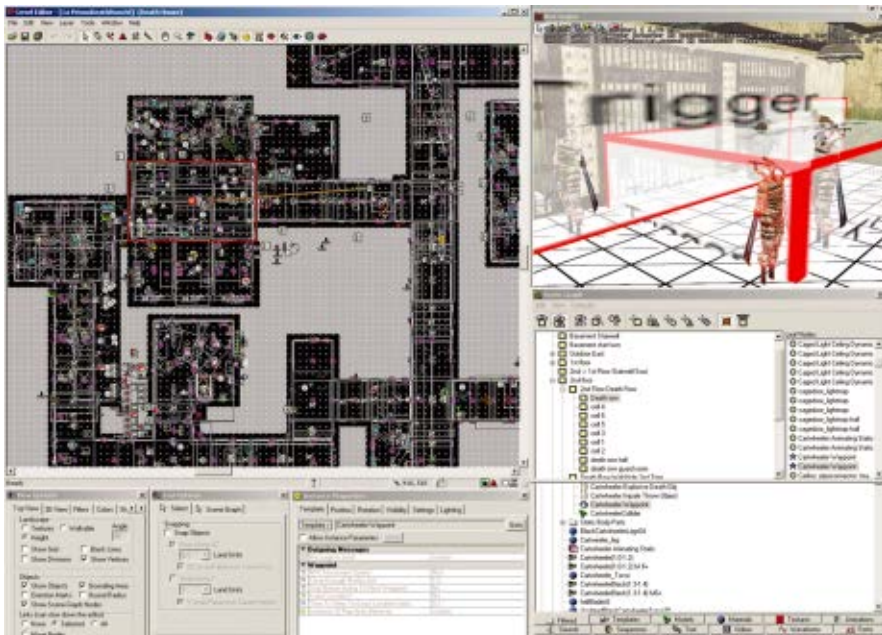
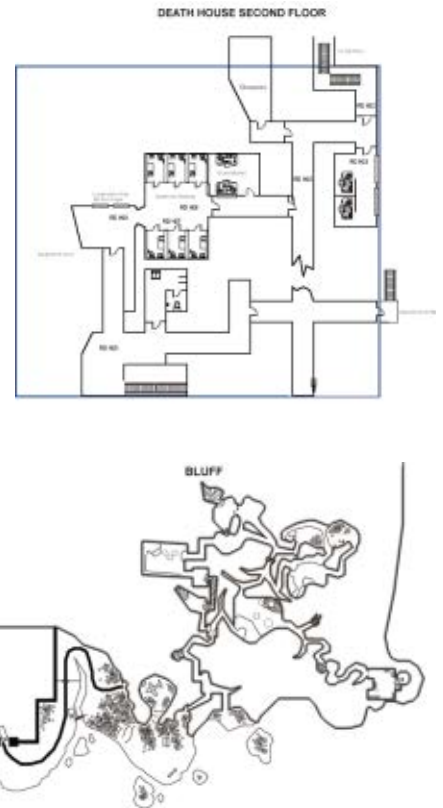
1. DESIGN CHANGES AND COMMUNICATION THEREOF. Previously I discussed how we shifted away from the console-style, target-lock-based shooting of *DMC* to the aiming-based shooting of PC first person

shooters. Without a doubt this was the right decision to make. Unfortunately, though I was never a big fan of emulating *DMC*, we went down that road for the first third of the project and invested a significant amount of time in game mechanics that we threw out. If we had more carefully analyzed what type of game we were making from the start we could have saved six man-months of work. Also, when we finally decided to make the switch, the change was not properly communicated to the whole team, and people frequently asked me, "But I thought we were trying to be like *DMC*?" In a collaborative large-scale project, having a design vision is useless unless it is clearly communicated to the entire team.

2. PUZZLE AND BOSS GAMEPLAY. Even given our best efforts and despite being granted time to iterate on the game, our puzzle and boss design was not up to the standards we wanted. Both the puzzles and bosses were flawed because of their unpredictability; they caught players off-guard by involving multiple complex mechanics that players had never used previously. Part of this was due to the fact that we re-did each individual puzzle multiple times, and thus whatever puzzle progression had been planned over the course of the game was no longer applicable. Our bosses were further problematic because we tried to force platformer-style bosses into a PC shooter-style game (indeed, the bosses fit better when the game was more in the vein of *DMC*). This oversight was not recognized until it was too late. It was also a conceptual goal to make the bosses involve non-violent conflict to contrast with the extremely violent nature of the rest of the game. This made designing them and making them fun quite difficult since our non-violent mechanics were significantly limited and not nearly as much fun as our violent mechanics. All of our bosses and almost all of our puzzles were redone one or more times prior to shipping, and though they improved tremendously they were never anyone's favorite part of the game.

PLANNING

Two 2D level maps created by the design team prior to level construction. The one on the top was created using Smart Draw, while the one on the bottom was made with Photoshop.



Surreal's proprietary Riot Engine Level Editor in action.



▲ The Surreal development team responsible for making **THE SUFFERING** an enjoyable experience.

SETTING THE MOOD



3. WEAPON VARIETY AND DISTRIBUTION. One of the drawbacks of setting a game in a real-world environment is that you don't have the opportunity for weapon diversity that you do in a science fiction or fantasy game. This is especially problematic for a shooter like **THE SUFFERING**, where constraining yourself to real-world weapons and avoiding those that don't fit the setting (rocket launcher, anyone?) means that you're hurting the gameplay experience for the benefit of the story. In the end, we really could have used one more weapon.

Also, our desire to make the game accessible to a wide audience resulted in a bit more ammunition available in the world than we would have preferred. This had the unfortunate side-effect of most players not using the "Insanity Mode" creature; most simply didn't need it unless they were playing on the harder difficulties. Though we did include multiple difficulty levels, most players will tend to pick the default and stick with it, even if they find the game too easy. Indeed, by the time they figure that out, they're a fair ways into the game and it's hardly fair to expect them to restart their game from scratch at a higher difficulty. It would appear that the answer is a dynamic difficulty adjustment system that automatically makes the game harder or easier based on how well the player is playing the game moment to moment. This is something other games have dabbled in and that we will undoubtedly be using in the future.

4. AI DESIGN ISSUES. Though we tried to make our game more accessible to players by supplying them with plenty of ammo, the primary reason our game is too hard for novice users is because our AI design was not made with our controls and player mechanics in mind. Having a creature that runs right behind you may be cool in concept and is something fairly well supported in a PC shooter using a keyboard/mouse control scheme or a console shooter with target-lock. However, with an aiming-based game using a console controller the player's ability to react to such events is significantly more limited. Indeed, our original target-locking control scheme supported this much better, and having the creatures move in this frantic fashion is another disjointedness that resulted from that transition. Furthermore, this is a classic example of a problem the development team is likely to be completely unaware of: since the developers have been playing the game for so long, they are extremely familiar with the controls and see a problem like this as a challenge instead of an annoyance. Indeed, whenever

I see "controls are sluggish" in reviews of the game, I interpret that to be because of this AI-behavior and the controls disconnect.

5. THE DENIAL FACTOR. After you've worked on a game for a year and a half, it's easy to overlook certain glaring flaws with your title. Thankfully our publisher and gameplay testers were able to point out many of these problems and we were able to fix most of them before we shipped. Nevertheless, we spent too much of the project in denial about problems with the game. This was true across all departments, but also in design, where poor puzzles, AI, and mechanics were ignored for too long. Since we put off fixing these issues until so late in the project we often had to use shortcuts and didn't have the time to polish the new solutions. We delivered a "first playable" of the game seven months into development that was supposed to be "shippable quality." Looking back on it now it's hard to imagine what drugs we were taking to make us think it was actually close to good enough. In the future, we plan on being significantly more strict with our quality levels over the course of development and to fix problems before we become accustomed to them.

HEART OF DARKNESS

I see **THE SUFFERING** as somewhat unique among console action-adventure or shooter games in the seriousness of its subject matter and the moral themes it endeavors to explore. This is something that I wanted from day one and I am fairly happy with the result we achieved. To accomplish this, we made a number of key design decisions, from the player's ability to effect the world in a believable way (killing friendly humans), to the storytelling techniques we used, to the morality system that leads to the distinct endings. In the end though, the compatibility of a game about human atrocities over the ages within the "gory shooter" game milieu was perhaps our biggest limitation. As games seek to engage the player with more and more serious subject matter, the game mechanics need to evolve along with them, giving the player a wider expressive range than deciding whether to kill or not to kill. But as they say, Rome wasn't built in a day. ❌

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JONATHAN BLOW

THE INNER PRODUCT

MISCELLANEOUS RANTS

AS I SIT DOWN TO WRITE THIS ARTICLE, THE Game Developers Conference is rapidly approaching. (It'll be in the past by the time this column is in print.) For me the conference tends to be a big milestone marking a yearly cycle of game development thoughts and happenings. I always come away from the conference with new ideas about what I ought to be doing.

This year, to prepare the way for new thoughts, I'm fleshing out some of the old ideas by getting them on paper. What follows is a series of short items I think are interesting, but too small to merit their own individual columns.

QUALITY OF SERVICE FOR NETWORKED GAMES

Fast-paced networked games are sensitive to network conditions—if you get a lot of latency or packet loss, the game can feel unplayable. The degree of robustness amid adverse networking conditions depends on the game's network architecture—some systems feel much more solid than others. Peer-to-peer lockstep games are the worst; every player is waiting for input from every other player for the simulation to progress, so if any player has poor networking conditions, everyone suffers.

A client-server game can be made very robust, so that a player's experience depends on the network quality of his or her client and server, but not the other clients'. The server can be run from a controlled location with effort spent to ensure the network quality is high. That way, the quality of the player's experience depends mainly on his or her own connection.

When first-person shooters initially became possible to be played across the Internet, they used this model. You could

place this at about the time of *QUAKE*; *DOOM* used a peer-to-peer setup and was painful to play over a wide-area network. But back then there were lots of modem-connected players, who tended to have poor play experiences due to their slow connections. They had to aim ahead of moving targets, would see enemies late, and had less time to react to ambushes, and so on. Around the year 2000, an *UNREAL TOURNAMENT*-mod called *ZEROPING* was released. *ZEROPING* aimed to improve the play experience by allowing a lot of computation to happen at the client side: you always hit what you aimed at, because the server believed your client when you said you hit someone.

Of course this opened up all sorts of cheating issues, but if you like the idea enough, you could convince yourself that the cheats could be detected, so you worked around them. This became an increasingly prevalent networking paradigm for first-person shooters. A more sophisticated networking system, designed to eliminate most client-side cheats while retaining lag compensation, was designed by Yahn Bernier for *TEAM FORTRESS 2* and *HALF-LIFE 2* (see For More Information on page 46). It was patched into a post-release version of *HALF-LIFE* as a test, annoying unsuspecting masses of dedicated *COUNTER-STRIKE* players around the world.

Yahn's lag-compensation system, and a few others since then, involves the server interpolating objects backward in time to compensate for clients' latencies, in order to detect hits. So, as Yahn says, "You hit what you aim at" for instant-hit weapons (applying this system to slower projectile weapons, however, is very confusing and may be infeasible, so he didn't do it); at the same time, the client can't just lie about what it has hit, because hit detection is decided by the server.

Lag compensation systems still have significant cheating problems (a client can lie about its latency), but even if they are solved, there are strange issues with this

kind of architecture that need to be discussed. I have been hoping for insightful, rational discussions about this subject, but few have surfaced. I think it's difficult to get a large body of people to think seriously about networking; by comparison, it's easier to urge them to discuss something like graphics, which is a lot more visual and openly appealing.

There are two basic issues that bother me about lag compensation systems (with the simple *ZEROPING*-style architectures included in this category). For one thing, a player is no longer in control of the quality of his game experience. A player with a perfect connection will frequently experience low-quality events: for example, getting shot when he seems to be safely around a corner. The worse the connection quality of the other players, the more often this will happen.

But the thing that's more subtle, and perhaps more troublesome, is that the learning curve of the game changes, to the extent it becomes much harder for players to learn from what happened to them and improve their play. In a vanilla client-server situation, where you must lead your target when lagged, you can see clearly when you hit or miss and can learn to adjust your play accordingly. You have a clear path you can take in order to improve. But with lag compensation, the effect of latency causes you to be killed in confusing ways, wherein your client is displaying a version of events that can be quite different from what the server considers to have actually happened. And in fact the server is constantly juggling conflicting notions of the world state, so there's in fact no objective reality for you to key in on. In such a situation, when you find yourself being killed but you don't have a clear idea of why it's happening, how can you improve your play? You can't determine which skills to acquire.

Certainly this end-result is upsetting to

JONATHAN BLOW

Jonathan Blow is about to go jam, jam, jam at the Indie Game Jam at GDC 2004. Jam his inbox at jblow@gdmag.com.

many expert players. But I'm not even sure it's a good play experience for beginners.

PROBLEMS WITH ACADEMIC RESEARCH

Back when I was new to game programming, I looked forward to attending conferences like SIGGRAPH because there was lots of high-end stuff there to learn from. Nowadays, I am usually dismayed by conferences like these. Yes, there are gems to be found in proceedings and sessions, but they are small and surrounded by mud. We're starting to see a bit of the same thing happening at the Game Developers Conference. I'm taking the academics to task for this, because it is ostensibly the main thing they're doing in life, so they really ought to be better at it. Here's my laundry list of problems with the current research environment:

PROMOTING A TECHNIQUE AS BEING USEFUL FOR games, while lacking an understanding of what is really appropriate for interactive applications like games. For example, algorithms that heavily exploit frame coherence in games should be avoided if you can help it, because they produce feedback in the sequence of frame times, causing stuttering and ungraceful failure modes. However, frame coherence is often the first tools people turn to in order to speed up an algorithm—they just do it by rote, because that's the way things have been done in computer graphics for decades. Most don't consider that these techniques were originally designed for batch applications, so no feedback loop would occur. For us, frame coherence optimizations should be a last resort.

NEGLECT OF THE SUITABILITY OF A TECHNIQUE FOR actual data people want to use. (Does it work on meshes with texture coordinates? Can you anti-alias the output?)

INAPPROPRIATE COST-BENEFIT TRADE-OFFS. All the time we see papers proposing tremendous increases in system complexity, and significant decreases in runtime robustness, to achieve some minor performance boost. Usually we can achieve a bigger boost by ignoring such a complicated algorithm and instead spending all that manpower hammering on a simpler algorithm.

RAMPANT SALESMANSHIP. Academic authors are usually trying to convince us that we should use their algorithm, when instead they should be objectively examining its behavior. Traditionally a paper must list an algorithm's disadvantages, but you'll find this section presented in a dismissive manner, written with the intent to convince you the disadvantages are

unimportant. These guys call themselves computer scientists but they are not being scientific.

Related to the salesmanship issue, papers typically say, "Our new algorithm B is much better than traditional algorithm A. Here are performance numbers to substantiate our claim." Because B was their pet project, the authors worked very hard to optimize and tune it; they rarely put as much effort into A. The comparison isn't fair or worth much.

I believe the field really needs more simplifications and unifications, rather than new complications. Every once in a while we see new work that goes in such a direction, and that's refreshing—but it doesn't happen often enough.

Let's go back for a moment to that frame coherence issue. I find this to be a subject with a lot of deep ramifications that are rarely explored. On some level, our entire computational architecture is based on coherence of one kind or another (memory caches and the like). Apparently when these coherence exploitations are fine-grained enough, they tend to average out and not cause much feedback. But still there are exceptional cases due to pessimistic input patterns. If we want to get rid of these, to make a game system that's truly real-time, we would have to throw away much of our current computing paradigm. This seems unlikely in the near term!

Another interesting issue arises at the algorithmic high-level. Some kinds of algorithms are insensitive to the frame time. Non-time-anti-aliased rendering is one of these; its runtime tends to depend solely on the scene complexity. But there are other kinds of algorithms (which we very much need) we don't know how to speed up without resorting to heavy coherence exploitation. Examples are physics and collision detection: as the frame time increases, they spend more CPU power, increasing frame time further. So we use coherence in these algorithms, but in doing so we create a situation that's somewhat limited.

SIMPLE COMPRESSION

This one's not a rant! Sometimes you want to write an integer into a file or transmit it over the network, and you know the integer is usually going to be small, though it could in rare cases be larger. To compress, we need an estimate of the probability for each value. Suppose there's a 50 percent chance of the value being 0; if it's not 0, there's a 50 percent chance of it being 1 (a 25 percent chance globally); if it's not 1, there's a 50 percent chance of it being 2 (a 12.5 per-

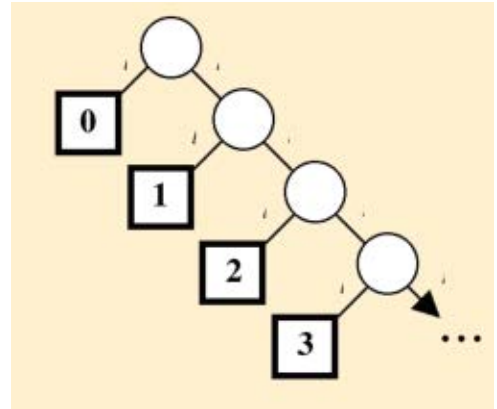


Figure 1. A Huffman tree for encoding the nonnegative integers, where 0 is the most probable value and the probability halves for each step up the series of integers. To help keep things clear, the edges have been labelled "l" and "r" rather than the 0 and 1 bits you might use to encode them. To encode the number 2 using this tree, you would output rrl, that is, 110. The ellipses indicate that the tree continues indefinitely.

cent chance globally), and so on.

The Huffman tree for this probability distribution looks like Figure 1. To build the Huffman codes from a tree, you just navigate from the root to the number you want to encode, outputting a 1 for each rightward branch and a 0 for each leftward branch. In this particular case, we see that a 0 always ends the sequence, and the number of 1s that come before that 0 is simply the number we're encoding.

So if your probability distribution is anywhere near this ideal, you can get good compression on your numbers without actually understanding compression, or doing any of the arithmetic coding stuff I've talked about in the past (see The Inner Product, August–November 2003).

HEXAGONAL LATTICE TEXTURE MAPS

As I discussed in "Transmitting Vectors" (Inner Products, July 2002), hexagons provide a lower-error tiling of the plane than squares do. With texture maps, we are trying to approximate a continuous surface of color (or some other quantity) with a lattice of samples, and usually we use a square lattice. If we use hexagons instead, we can save memory, because we'd need fewer samples to achieve the same amount of resolution. Furthermore,

THE INNER PRODUCT

we would increase isotropy, which can be extra important when using texture maps to approximate pieces of functions and then multiplying them together or combining them in some other way.

This raises interesting questions, such as what coordinate system would be best to index the texture map? It'd be an interesting area to experiment in, though low-level hardware support for hexagonal texture maps seems unlikely. Nevertheless, I think one could do some wacky and fruitful experiments by projecting slices of a 3D cubic texture map down to 2D hexagonal maps. (See Charles Fu's posting in For More Information).

For rendering, this is likely to fall into the general category of "too hard to deal with to be worth the benefit," so I'm not recommending you go out and stick this into our engine. But as a technique as pervasive and fundamental to what we do as texture maps, I like to understand everything I can about this. If we do something inefficiently, it should be out of choice,

not ignorance. [For a use of hexagonal texture maps in computer vision, see Lee Middleton's paper in For More Information.]

COMPUTER VISION

The state of computer vision research can be split pretty easily into two parts: the low level and the high level. The low level is about looking at grids of pixels and extracting useful information from them (passing filters over the image, using signal processing to measure texture, phase congruency detection, the generalized Hough transform, and things like that). The high level is about taking that low-level information and doing some AI to parse the image (recognize shapes in the scene, detect faces, or whatever).

In general, the low-level research is well-founded. Those guys know what they're doing, and their work is based on solid concepts. Sometimes when I read a good low-level computer vision paper, I feel like it's written by the Terminator. On the other hand, high-level vision papers always seem like they're written in crayon. The concepts involved are obviously total hacks, which clearly won't work in the general case, or lead to

any kind of substantial high-level vision paradigm. To date, the best high-level vision research doesn't seem to be anything you wouldn't think of yourself if you were sitting down for a weekend and sketching out some ideas. But the high-level papers seem to take themselves very seriously, for some reason. ❌

FOR MORE INFORMATION

Yahn Bernier, "Lag Compensation," www.gdconf.com/archives/2001/bernier.doc

Lee Middleton, "Markov Random Fields for Square and Hexagonal Texture Maps" www.ecs.soton.ac.uk/~ljm/archive/c_middleton2002mrf.pdf

Charles Fu, "Which point is in the hex?" posted to rec.games.programmer, June 1994. Message-ID <2sqchi a1j@gap.cco.caltech.edu>.

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BEG, BORROW, AND STEAL

GO BACK AND TAKE A SECOND LOOK. IT'S AN

oil portrait, Phil Spitbite by Chuck Close, right down to the dust on the lens, the film grain and the depth of field. If this were *ArtForum* instead of *Game Developer* you'd have to brace yourself for terms like "deconstruction," "picture plane," and references to Magritte. Lucky for you I'm only bringing this all up by way of a clever metaphor. Since this is a month for new directions, we're going to step out of the technical arena for a bit and spend



Portrait of Phil (1969) by Chuck Close, synthetic polymer (copyright Whitney Museum of American Art, New York).

some time pondering the way the game industry borrows from other media.

In the late 1960s and early 1970s, painters like Chuck Close, Richard Estes, and Audrey Flack pioneered the meticulous recreation of photographs in oil. The term "photorealism" is just about as old as John Carmack. Painters, of course, have been working from photographs almost as long as there have been photographs. The theoretical gimmick of photorealism is that the paintings openly proclaim their photographic inheritance by reproducing not only the geometric accuracy of the camera but also its limitations: depth of focus, limited dynamic range, barrel distortion, and so on. The art school graduates among us can easily imagine how many hours of cocktail party boredom can be generated from the juxtaposition of reality and image, medium and subject matter. (If you didn't go to art school, you can get the same effect by hanging out in a *Matrix* fan forum for a few hours.)

DECONSTRUCTING GAME ART

It's easy to understand why the art world might embrace a painter who cleverly undermines the idea of representational painting. That's what we have an art world for. What's interesting is, games do the same thing all the time. Somehow I doubt kids in cyber cafés in Seoul are sitting around saying things like "HALO's subversive use of lens-flare radically deconstructs the notional game space." So why does our industry devote such phenomenal energy to recreating the artifacts of other media? From optical lens flares and obviously photographic textures on the technical side to every half-baked convention of action movie plots, we seem to spend more time imitating movies than we do making our own games.

On one level the reason is pretty obvious. The game industry's no-nonsense definition of realism is basically "what we see in TV and movies." While this might leave something to be desired as philosophy, it's a perfectly reasonable marketing decision for a mass medium like games. A lot of the time

it's also a great fit for the subject matter. When MADDEN copies the camera works and commentaries of televised football matches, it's not just a clever postmodern strategy. It's satisfying the basic desire of a game player: "Wouldn't it be cool if I could be in charge of the game playing out on my TV?" You could probably devise a football interface that gives better tactical control, if the point of the game is simply to beat the computer. But it's unlikely MADDEN 2005 will sport a jet-fighter-like HUD with GPS and radars. The role-playing at the heart of the game is not about strategy and tactics, or even athletics—it's about the life on the little screen.

Unfortunately, games are not really close to actually looking like TV and movies. We've made amazing strides in that direction since DOOM, but let's face it: there's a lot of stuff in MADDEN that's only going to pass for televised football from 20 yards away. A Chuck Close oil painting looks more photographic than a frame from any real-time game on the market today. Despite all of the brilliant work by game coders and artists, each problem we solve leads to a new, more difficult one. As each individual problem is conquered, it makes all the limits we used to accept happily seem that much worse. Higher resolution models reveal the mediocrity of our standard lighting systems. New multi-pass materials make it painfully obvious how badly Gouraud shading handles living skin. Improved animation playback lets us see how badly we need muscle deformation and cloth simulation. Some day, presumably, these problems will be solved and we'll get our nightly news delivered by undetectable digital reproductions of renowned news anchors (*Have you watched the news lately?* —Ed.). In the meantime we have to live with the fact that what we do just isn't going to be photoreal-

STEVE THEODORE

Steve started animating on a text-only mainframe renderer and then moved on to work on games such as *HALF-LIFE* and *COUNTER-STRIKE*. He can be reached at stheodore@gdmag.com.



The interactive war epic **MEDAL OF HONOR: RISING SUN** (EA Games, GameCube, Xbox, PlayStation 2), presented in Technicolor.

istic. The fact that complete realism is out of our reach means we need to be smart about what we do. For the foreseeable future, our jobs will still be closer to illustrations than to photography. For lack of a better way to put it, we are doomed to have style.

Accepting that you have a problem is half the battle (as they say in AA meetings). Being aware of the limits of what we can represent on screen doesn't mean we should start making conceptual art games where all the textures are matte black or the models are randomly generated collections of triangles. It does mean we should have the courage to make design judgments openly and on their own merits. It means we can't hide behind technical arguments when the real problems we have to solve are artistic ones.

This is especially true for games that are theoretically realistic in subject matter. It's pretty hard not to acknowledge the role of the artist in bringing a talking hippopotamus or a two-headed troll to life. This may be the reason fantasy games have always displayed more individuality in execution than other genres. But creating an accurately costumed SWAT trooper involves almost as much aesthetic judgment and independence as building a fantasy creature. Here our habit of borrowing from other media tends to work against us. Many of our colleagues confuse artifacts of other media with reality. How many texture artists have had to leave flaws in their photo-based textures in order to satisfy the appetite of their teams for film grain and depth of field? How many animators have

had to shoehorn mocap files onto unsuitable characters because the slightly noisy, sampling artifacts of mocap seem more "real" than keyframes?

Photos and motion capture aren't bad or artistically insufficient. Nor are they a threat to our jobs. Being afraid of an input technology isn't a sign of genius, but of weakness. That being said, the value we attach to any technique should be derived from the needs of the game, not by a half-conscious feeling that some things are more real, hence better than

others. Most of us have had colleagues who use "realistic" as a synonym for "I like it" and "unrealistic" as a catchall term for any feeling of dislike, however subjective. Even worse, the comment "it's not right" is second only to "just like this, only cooler!" in the ranks of useless feedback. Certainly, there really are some basically objective measures that any realistic work will have to meet. But that's not the only hurdle we need to overcome. If we're going to help our medium mature, we're going to have to make a lot of unashamedly subjective decisions about just what constitutes real for games.

BATTLING REALITY

For a concrete example of how much room there is for subjectivity in a realistic genre, consider the last few years' World War II-themed shooters. From a technical standpoint there's not a whole lot to distinguish them from one another, although naturally the more recent games benefit from the onward march of video cards. Yet there are some remarkable differences among them despite the similarity in subject matter. The first wave of World War II games from 2001 to 2002 did tend to bear an unnerving family resemblance, particularly in their similar use of photo-textured environments. While they were all pretty well done, none of them

displayed a recognizable visual identity. In more recent incarnations, though, their successors have differentiated themselves with distinct art directions as well as different subject matters. For example, **MEDAL OF HONOR: RISING SUN** (EA Games) moved toward a lush, tropical color selection right out of an early 1960s Technicolor epic, which complemented the game's larger-than-life aspirations, particularly in the opening Pearl Harbor scenario. At the same time **CALL OF DUTY**'s (Activision) raw, under-saturated palette and dramatic lighting strongly reinforce its grim gameplay. If you mentally transpose **CALL OF DUTY**'s Stalingrad suicide charge into the gentle colors and softer terrains from, say, **BATTLEFIELD 1942** (EA Games), you can see immediately how much freedom Infinity Ward's artists had and how well they used it in developing **CALL OF DUTY**.

There's no denying that the key scenes in both **CALL OF DUTY** and **MEDAL OF HONOR: RISING SUN** draw pretty heavily on the movies—another in a series of importations that would have given the art press a theoretical field day if they played games. The more important import in each game, though, is not just a cool scenario idea—it's the cinematic notion of production design. This is what we really ought to be



The gritty war drama **CALL OF DUTY** (Activision, PC) featuring battle scenes painted in an under-saturated color palette, coming to a PC near you.

trying to appropriate for ourselves. By definition, everything that passes through the lens of a movie camera is real. But Hollywood spends staggering energy on plucking, trimming, and airbrushing each slice of that reality to fit a particular vision. Every element of every shot is planned and manipulated for maximum effect. The greatest exponent of de-realizing film is of course Peter Jackson—almost any random frame from *The Lord of the Rings* trilogy is instantly identifiable because every frame has been planned, shot, and color-graded in the mold of Alan Lee's and John Howe's classic book illustrations. Mainstream audiences responded intuitively to the emotional power of the images without stopping to question the forced perspectives, the impossible lighting, or the implausibly perfect color harmonies. Perhaps an equally effective film could have been made if Steven Spielberg and the cinematographer from *Saving Private Ryan* had filmed the siege of Minas Tirith. But it would have been an unmistakably different exercise, right down to the film grain. It's more complex than the individual director's preferences for different designs or differ-

ent CG artists. Even the most mundane aspects of the process—lighting, set decoration, even the choice of film stock and lenses—are conducive to the creation of a particular vision. It's a long, long way from just pointing a camera at reality and letting it roll.

THAT'S WHERE THE MONEY IS

Game industry boosters are fond of saying, "Our industry is like the movies of the nickelodeon era—just a feeble prelude to the mighty cultural force that is to come." We share with the early film pioneers a set of rapidly evolving technical problems, the heady potential of a new medium, and a tendency to reinvent the camera before every new production. Above all, we share an inferiority complex, big enough for a pretty obvious rip-off of the APC in *Aliens* to drive through. A lot of our work is the high tech equivalent of filming stage plays—right down to

the curtains—as moviemakers used to do before the modern grammar of film production evolved. Chris Crawford used to rail against the movie envy that led game designers to put up scrolling credits, but in fact it's perfectly natural that we turn to established media for inspiration. Film and TV are the richest treasuries of contemporary culture. As Willie Sutton said when people asked him why he robbed banks: "That's where the money is."

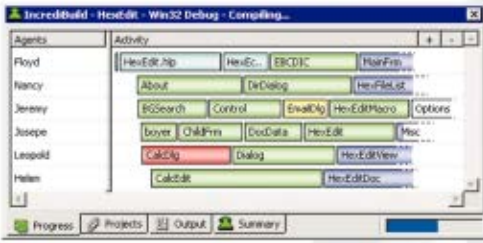
The important thing is, though, to be sure we take the valuable stuff. We need storytelling and emotion manipulation skills, not film-grain filters or cheaper 3D cyber-scanners. We need meticulous pre-production, strong professional education, and above all the ability to marshal individual artistic talents into a coherent vision. When we're doing that on a regular basis, we will no longer be preoccupied with arguments about photo textures versus hand painting or mocap versus keyframes. When we really learn the important things film and TV have to teach us, we won't need to keep hitting them up for more inspiration.

As Picasso used to say, good artists borrow but great artists steal. ❖

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SEAMUS BLACKLEY

NECESSARY EVIL

AN INSIDE JOB

A SPATE OF ARTICLES HAS APPEARED LATELY regarding securing and negotiating publishing deals, mainly as a reaction to the perception it's nearly impossible to get a game deal approved (even one that has a major license attached). Developer business people give ideas for deal points, publishers are asked to describe the internal processes proposals go through, war stories are recounted, worst pitches are shared by both sides, and lessons are drawn.

There is plenty of good information in these stories: be professional, understand that publishers are out to make money, be honest with yourself about your game idea, retain your IP rights, and so on. There's really not a lot to add; much of it is good advice.

The interesting thing is, they're actually missing the most important part (stay with me here). I'm always amazed by developers who think the publishers employ a product-selection process that's organized, rational, and prudent (or—the opposite—incredibly random, insane, and stupid), compared to what goes on every day at their own companies. One gets the impression a lot of developers believe publishers are staffed largely either by Vulcans or drooling mental patients.

RANDOM CHANCES. Perhaps what's disappointing is, publishers are actually just companies full of people who behave in much the same way people do everywhere

else—they do their best, make a lot of guesses, and sometimes come out on top. They worry about their jobs. They worry about peer pressure. They spend too much time on eBay.

Having been through the whole mess personally from being a programmer-with-an-idea all the way through sitting on a console manufacturer's title approval board, I can tell you the process of determining which

chance while others didn't.

Every publisher has their own "shampoo people," and if there isn't someone like my friend helping them understand why your game will make them look good or it's worth supporting, they will say no. Remember—from their perspective, giving the green light to a title that fails could well put their careers in jeopardy. And the less development experience they have, the more nervous they will be, and the more effort it'll take to convince them your idea is even marginally different from something that's already out there and thus already a measurable quantity.

So here's the rule: no game ever gets approved, or even gets close to being approved, if it doesn't have a passionate internal advocate who will actively educate and persuade the necessary people they should sign on.

Sometimes, in the Hollywood-startlet-discovered-while-waiting-tables model, we imagine someone at the publisher sees our perfect, glossy, demo-luscious proposal and falls head over heel in love with it, they seek us out, start a relationship, and act as our champion in the approvals process. If you are counting on this, you may as well prop your pockets open with Q-Tips in the hopes that millions of dollars will fly into them from the sky as you walk to lunch.

In reality, identifying and cultivating a relationship with a strong internal advocate is without question the most important thing you can do to get your game approved and approved under favorable terms. It's something you'll have to do intentionally and doggedly, and it's a two-way street—you will likely be modifying your designs, and generating substantial amounts of art, schedules, budgets, and even code for this person to use to get the points across. Arm your advocates generously, and remember that if you make them into heroes, they can make you into heroes. ❖

One gets the impression a lot of developers believe publishers are staffed largely either by Vulcans or drooling mental patients.

titles have the best chance of being successful is usually just as random as anything else that happens in a big organization. Games that get huge internal support and thus huge marketing pushes routinely fail, while games that struggled to avoid cancellation have made incredible fortunes. The same thing happens in Hollywood.

The challenge is, wherever you go to get money, there will inevitably be a panel of people (usually too many) with exceptionally diverse backgrounds. You'll need to convince most (or all) of them that what you are proposing will make more money for their company, and consequently make them look smart (and net them a big, fat bonus) for funding to be approved.

WHO'S YOUR SHAMPOO GUY? I have a good friend and industry veteran who was a key member of such an approvals committee at a very large publisher. He tells a lot of funny stories about how he'd have to convince marketing people fresh out of the shampoo industry certain games had a

SEAMUS BLACKLEY

Seamus Blackley represents creative talent from the game industry at Creative Artists Agency in Hollywood, where, in movie and TV pitch meetings, he plays the role of the guy from the shampoo industry.



ALEXANDER BRANDON

» AURAL FIXATION

THE AUDIO MANAGER'S GUIDEBOOK

AUDIO IS BECOMING AS IMPORTANT AN

element as ever in games, not only due to increased production and implementation needs, but also because it's becoming more difficult to point to a game and say, "That sounds great, what game is it?" Games used to sound unique but the public didn't buy game albums. Now that they're buying game albums, games don't sound as unique anymore. They sound like film or TV or radio. In this climate, having your basic management skills in place will help unleash the kind of creativity required to compete with those other media. Note that this applies to someone with the "audio manager/director" title as well as the others on the audio team, whether they're in house or remote.

PRE-PRODUCTION. Audio was nonexistent in pre-production until recently, mostly because people associated game audio—even those from forward thinking studios—with film audio. Now that audio implementation has become just as crucial as AI path finding, it's clear steps need to be in place to combat having buggy tools and misunderstood preferences for instrumentation ("That song is a bit too 1980s for me!"), among a myriad of other issues.

1. GET THE TECH (HECK) OUT OF THE WAY:

Your audio engine is the foundation. Figure out what you want to do with your game from the design team, even if they're not quite sure of the details, and plan for a flexible audio engine that will allow you to do exactly what you want. If you're asked to make a change, you should be able to say "sure," tweak a knob, and be done. That's an excellent reason for pushing for more channels

and a rock solid data control methodology.

2. PROTOTYPE: Once you have your flexible engine, demo it. You say, "Oh no! The code isn't there—I can't do it!" Balderdash. Demo it in a multi-track program like Nuendo, Cubase, or ProTools. Create a scene from the game and track it out exactly as it should play in the engine, then document the behavior of your VST/TDM plugins and envelopes in terms your engine can understand. The coders should hear the light and know what you expect rather than listening to garbled audio.

3. INSTRUMENTATION: I can't stress this sucker enough. Schedule instrumentation R&D. The instruments in your soundtrack will tell people whether you're yet another

similar. There's listening, and there's active listening. Listen actively for a change. Wow, great instrument there! Write it down. That was a cool transition. How did they do it? Awesome use of bass! You get the idea.

An example of this is from the aforementioned UNREAL TOURNAMENT 2004. It has an extremely recognizable tank mounted machine gun sound. Why is that? Not just because its volume is pumped up, it's distinguished with more space between shots than the sound of other rapid-fire weapons. It also has more attack.

2. FIELD AND FOLEY: It's easy to run out with a DAT, but once you're outside you begin to mumble, "Uh! What do I record?" Do your homework on what can be recorded and captured for practical use, then go outside on your field trip. This planning should be done in pre-production, but sometimes recordings need to be done during production as well.

As far as foley goes, the same is true. Waltzing into a studio and ripping up lettuce while you giggle isn't going to produce anything except the sound for rending flesh while a lunatic is lurking in the background. Plan ahead and think: "X object might work against Y object to make Z sound."

3. JAM! With dozens or even hundreds of in-door facilities offering studio spaces, creeping in at night (provided your company is okay with it) to play around and have fun should be a given. It'll hone your chops and get you closer with other members of the company.

These are only a handful of the methodologies available, but surprisingly few people are using them on a regular basis. They're meant to serve a dynamic development environment (games embody this kind of system). While there are many books on organization development, process management, and industrial engineering, they offer mostly general-purpose guidelines. Hopefully these specifics will help speed up your project way faster than the previous ones. ❖



John Williams copycat or an original thinker. Take those factory presets and pick the best of the bunch, then edit them until they're even better. Search sample CDs, dive into Reaktor. Be different while working within your game genre's limits.

PRODUCTION. Even in production there's the possibility of downtime. When that day comes, there's an awful lot to keep an audio staff busy.

1. PLAY GAMES: Sure, you play the odd, cute web game for a few minutes here and there. You might even play a bit of UNREAL TOURNAMENT 2004, because it's so damn fun. Playing games and listening to music are

ALEXANDER BRANDON

Alexander Brandon has been involved with game audio since 1994 and is currently the audio manager at Midway in San Diego. You can e-mail him at abrandon@gdmag.com.



NOAH FALSTEIN

GAME SHUI

THE FLOW CHANNEL

FENG SHUI \FUNG SHWAY—AN ANCIENT

Chinese practice that aims to maximize the beneficial flow of chi—the universal life force present in all things—through an environment.

Game Shui \gaym shway—A modern international practice that aims to maximize the beneficial flow of fun—the universal medium of enjoyment—through a game player.

This column has a new name, and perhaps a new direction—it's up to you. I am continuing my work on The 400 Project, formulating and listing rules of game design. But that doesn't have to be the continuing focus of this column. This is your chance to suggest to me what kind of game design information would be most relevant and valuable to you. More input from famous designers of recent hits? More focus on useful algorithms and practices? More underlying theories and results of game research? Or has the recent focus of this column been about right? Send your comments to me at the e-mail address below.

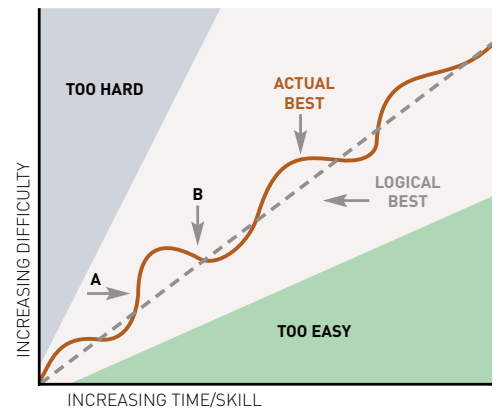
FROM FLOW OF FUN TO JUST PLAIN FLOW.

Feng Shui literally means “wind and water” and deals with the flow of life force. That reminds me of Mihaly Csikszentmihalyi, a psychology professor and the author of *Flow: The Psychology of Optimal Experience*, which I highly recommend to game designers. The subject is a state of mind called flow, a pleasurable state of concentration, “when a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile.” He also mentions that a characteristic of flow is all

attention is focused on the task at hand, and everything else fades away. This is a state that can be achieved in many activities, but is very often enabled by good games. In his book, Csikszentmihalyi includes an interesting graph similar to what I've shown here, minus the gray and red lines. He describes a flow channel, describing how someone learning a game can maintain the flow state if both the challenges and the player's skills increase at about the same rate, avoiding the extremes of getting very difficult too quickly (the blue zone) or failing to challenge the player by staying too easy (the green zone).

A MEANDERING RIVER. How does this tie into game design? One of Hal Barwood's original 400 rules was, “Fight Player Fatigue.” There are two primary ways players tend to get fatigued: becoming frustrated because the game is too hard or becoming bored because the game is too easy. This would suggest at first thought a smooth increase in difficulty over time—the dashed gray line in the illustration labeled “Logical Best.” But there's a third possible source of fatigue—when the game becomes too predictable and lacks variety. It turns out people really prefer a difficulty increase more or less like that shown in the red line labeled “Actual Best,” which meanders between easy and difficult extremes.

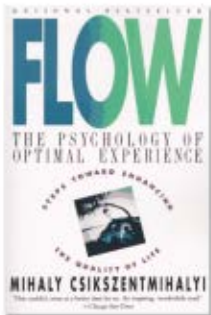
By varying the rate of difficulty increase, the game mimics a natural rhythm common in other entertainment forms like songs, symphonies, plays, movies, and novels. The structure generally features sharply increasing periods of tension (like point A) interspersed with releases (point B), where the difficulty may even decrease for a while before increasing again. There are many



A comparison of the Logical Best and the Actual Best approaches for increasing difficulty levels in a game [scale reconstructed here based on Csikszentmihalyi's model from *Flow: The Psychology of Optimal Experience*].

venerable mechanisms designers have employed to achieve these aims—boss monsters give us the sharply increasing curve of point A, while easy bonus levels give us the easier trend of point B. Or perhaps the same tension/release effect is conveyed by designing a situation where the player can attack a horde of opponents defending a treasure room, where many useful items are subsequently found for the taking. This variation of a buildup to a particularly difficult effort followed by a period of comparative ease before the next challenge is fundamental to our enjoyment of the flow of a good game.

In practical terms, this suggests designers need to pay close attention to the pacing of their game. Since our interactive medium gives a lot of direct control to the player, we tend to create pacing by varying the difficulty of successive segments (often levels or physical areas) of the game. Some designers have very specific goals for including interesting challenges at regular short, medium, and long intervals throughout a game. There are rules that are helpful in determining the ideal spacing of these challenges, but that will have to wait for a future column. ❖



NOAH FALSTEIN

Noah is a 24-year veteran of the game industry. His web site, www.theinspiracy.com, has a description of The 400 Project, the basis for these columns. Also at that site is a list of the game design rules collected so far, and tips on how to use them. You can e-mail Noah at nfalstein@gdmag.com.



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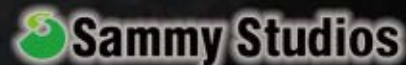
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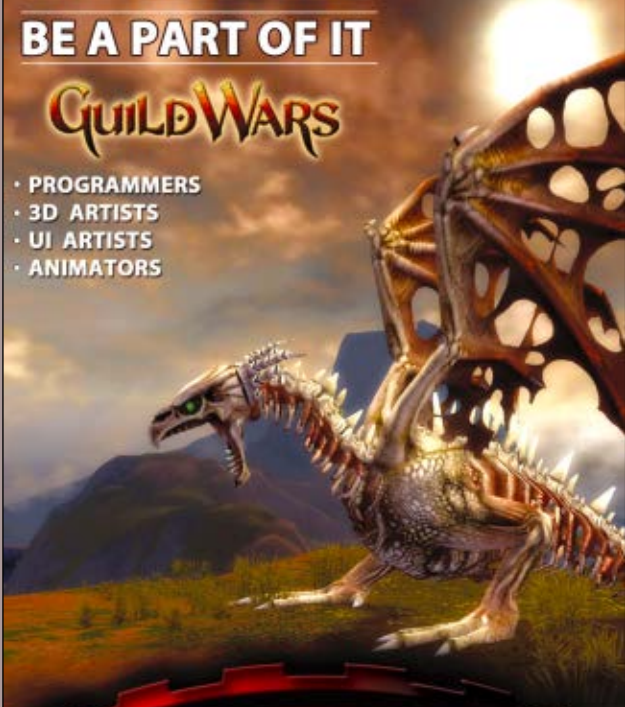
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Star Wars: Knights of the Old Republic
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HK-47 from *Star Wars: Knights of
the Old Republic*

ROOKIE STUDIO OF THE YEAR

Infinity Ward for *Call of Duty*

EXCELLENCE IN AUDIO

Chuck Russom for *sound effects in
Call of Duty*

EXCELLENCE IN GAME DESIGN

David Chateaufneuf, Patrice Desilets,
Jordan Mechner and team for *game
design in Prince of Persia: The Sands
of Time*

EXCELLENCE IN PROGRAMMING

Dominic Couture, Feng Quan Wang
and team for *graphics programming in
Prince of Persia: The Sands of Time*

EXCELLENCE IN VISUAL ARTS

Masanao Arimoto, Yoshiki Haruhana
and Satoru Takizawa for *art direction in
The Legend of Zelda: The Wind Waker*

EXCELLENCE IN WRITING

David Gaider, Drew Karpysbyn, Luke
Kristjanson and Peter Thomas for
*writing in Star Wars: Knights of
the Old Republic*

GAME INNOVATION SPOTLIGHT

EyeToy: Play by *Sony Computer
Entertainment Europe*

Viewtiful Joe by *Capcom*

WarioWare Inc.: Mega MicroGame\$
by *Nintendo*

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Game Developers Choice Awards
advisory board, were also presented
at the ceremony.

LIFETIME ACHIEVEMENT AWARD

Mark Cerny: *Production genius and mas-
ter collaborator on such successes as arcade
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FIRST PENGUIN AWARD

Masaya Matsuura: *A pioneer of beat-
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Jammer Lammy.*

MAVERICK AWARD

Brian Fiete, Jason Kapalka and
John Vechev: *The founders of PopCap
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IGDA AWARD FOR COMMUNITY CONTRIBUTION

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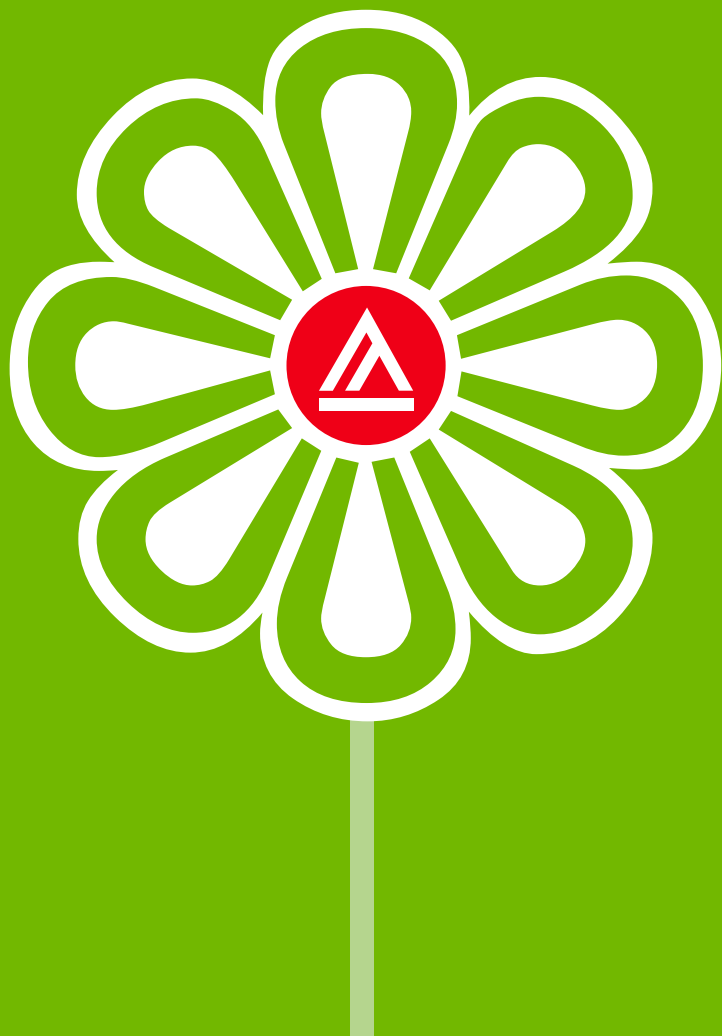


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The D.I.C.E. Summit

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content was engaging and informative. EA co-founder and chief creative officer, Bing Gordon, led off by sharing some of EA's worldview. Favorite sound bite: To a kid in college "videogames are safe sex." A panel moderated by *Newsweek's* N'Gai Croal that included marketing VPs Perrin Kaplan (Nintendo), Tony Kee (Ubisoft), Peter Dille (THQ), and Chip Lange (EA), picked up where Bing left off and discussed how to target tomorrow's consumer today. Words of wisdom: Today, gamers range in age from four to 50. Cool incubates young, whereas 25-to-35-year-olds are trend followers. Sequels equal retail comfort.

Other session highlights: Flagship Games CEO, Bill Roper, discussed the hazards and benefits of unintended consequences in game design. David Hayter (writer of both *X-Men* movies), EA music and audio exec., Steve Schnur, Jason Hall (Warner Interactive), and Steve Youngwood (Nickelodeon) talked about the convergence of games and Hollywood, before Jason Rubin threw down the gauntlet and issued his manifesto (see Jamil Moledina's interview with Jason on page 32 for the lowdown).

Another panel of Wall Street analysts described how the investment community looks at the game industry, and values predictability in earnings above most everything else. Peter Molyneux described the shape of things to come by previewing *TABLE*. Jordon Mechner and Patrice Desilets described how they built *PRINCE OF PERSIA: THE SANDS OF TIME*, and finally Trip Hawkins (EA, 3DO, Digital Chocolate, et al), Jeff Nuzzi (THQ), Lee Crawford (Stadeon), and Mitch Lasky (Jamdat) talked about what the next 12 months hold in store for wireless gaming. —DM

Test-Drivers Wanted

— continued from page 8

TERMINATOR 3: WAR OF THE MACHINES, and SATURDAY NIGHT SPEEDWAY were all released through Trymedia simultaneously with retail. Eidos and Atari plan to make many of their forthcoming titles simultaneously available through Trymedia and retail outlets this year.

Since the company's online delivery network can relieve a publisher of the need to establish its own distribution channels, Trymedia has also attracted many small and mid-size publishers with modest budgets, producing mainly card games and puzzle games. But the company's growing list of mainstream publishing partners promises to diversify the selection in its catalog, available online at www.trygames.com. For consumers with limited bandwidth on dial-up connections, the company recently added the option to receive trial games on CD.

Console gamers, who don't have the option to download trial versions from Trymedia, can turn to companies like Gamefly

(www.gamefly.com), RedOctane (www.redoctane.com), Angel Gamer (www.angelgamer.com), or RentZero (www.rentzero.com) to test-drive the latest Game Boy, GameCube, PlayStation 2, and Xbox titles. Co-founded by game industry veterans Sean Spector (formerly at Disney Interactive) and Jung Suh (formerly at EA and Activision), Gamefly allows its subscribers to rent console games via mail for a monthly fee, much in the same way Netflix does with DVDs.

Game publishers, according to Gamefly's Suh, are beginning to pay attention to the rental market, but not as actively engaged in it as they should. The hesitation is based partly on the assumption that the rental market infringes on the retail market. "But people who rent videogames don't stop buying games," Suh points out. "Renting gives people the opportunity to try out many different titles, so it helps them spend their disposal income more wisely on titles they like." —KW



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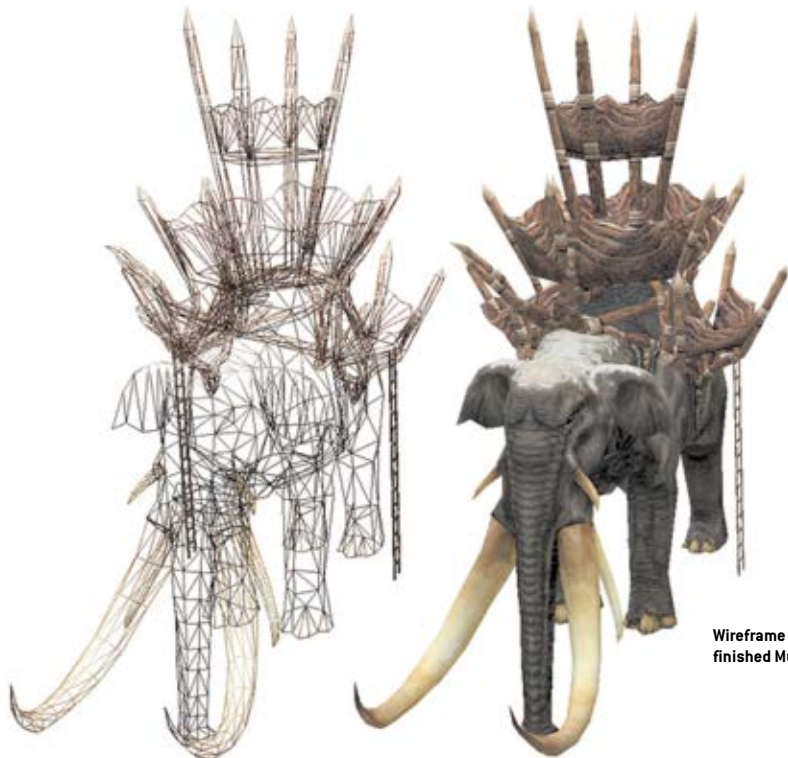
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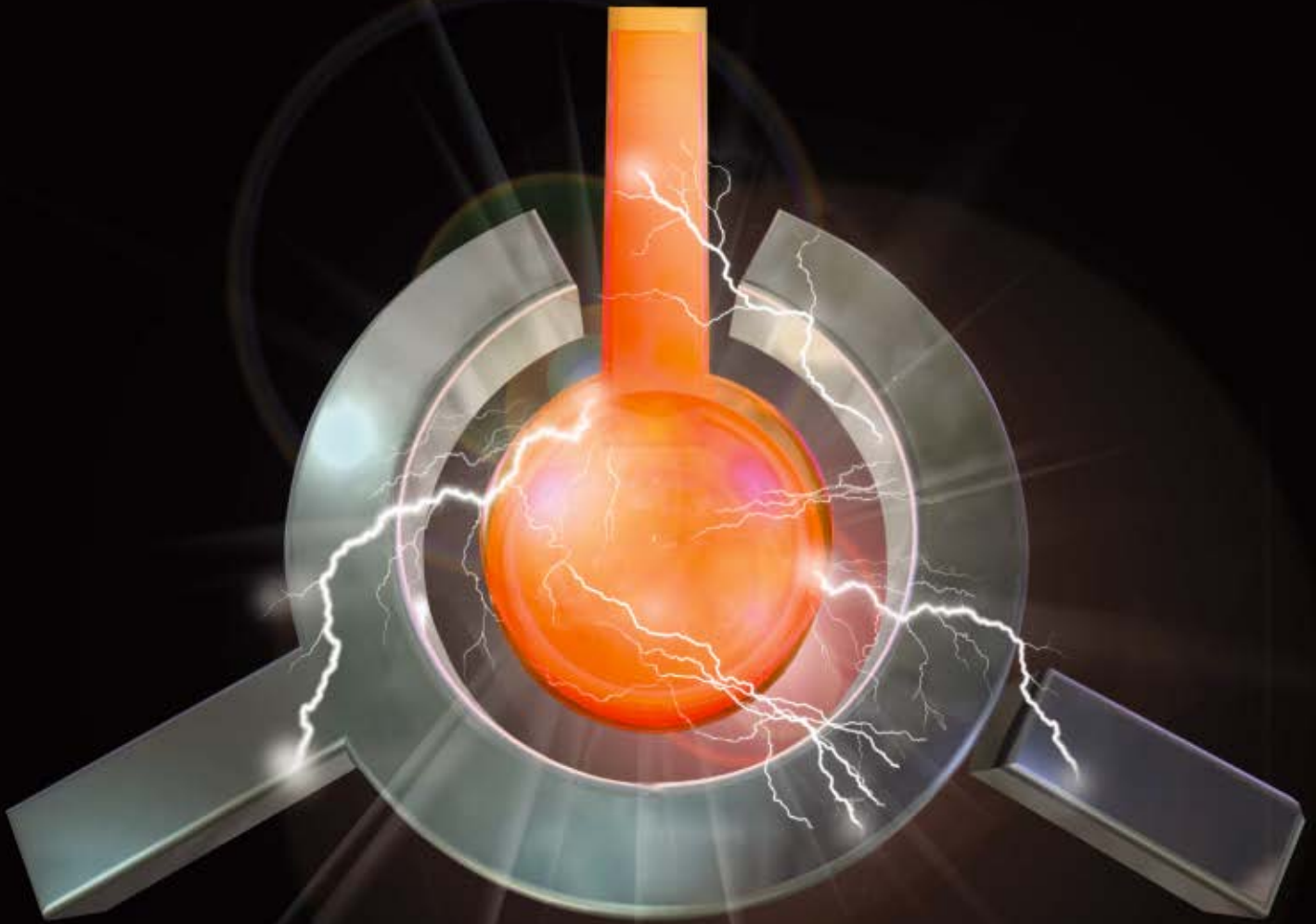
THE LORD OF THE RINGS: THE BATTLE FOR MIDDLE-EARTH is an RTS set in the fantasy world presented in J.R.R. Tolkien's *Lord of the Rings* trilogy. Currently under development by Electronic Arts, the game builds on the battles shown in Peter Jackson's cinematic adaptation of the books, featuring the sound and visual assets from the films.

For the above image taken from a preliminary animation, VP and executive producer of **THE BATTLE FOR MIDDLE-EARTH** Mark Skaggs provided the high level concept and direction. Senior producer Harvard Bonin and designer assistant Jason Bender established what it would look like. Bender and software engineer Kris Morness implemented the art, working with audio director Mical Pedriana. Bonin reviewed, gave feedback, and presented to Skaggs. The process repeated until Skaggs approved it.

—Jamil Moledina



Wireframe and finished Mumakil



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