Games People Play

BY CHARLES GERENA

How a major computer and video game cluster formed in rural central Maryland

On a quiet afternoon at Wegmans supermarket in Cockeysville, Md., groups of people bathe in the glow of their laptops while eating lunch at a café that overlooks the expansive supermarket. Some of those flickering screens belong to computer and video game developers on their lunch break; other developers favor a nearby Thai restaurant or grab a burger from Five Guys.

The Hunt Valley region of Baltimore County has been a center of activity for both developers and publishers in the entertainment software industry since the 1980s, when a fighter pilot with an MBA and a programmer decided to turn their love for games into a money-making enterprise. Hunt Valley became their headquarters because it was near their homes and office space was affordable. As the industry matured into a multibillion dollar business, most of the offspring of their company, MicroProse, remained in the region while other developers and publishers like Bethesda Softworks were established in Montgomery County about an hour's drive away.

For the programmers, artists, sound engineers, and other specialists who have to collaborate to produce a game, there are advantages to companies in the same industry locating in the same place, whether it's Silicon Valley or the rolling hills of Hunt Valley. Economists refer to these advantages as localization economies.

Also, the region provides an alternative to more urbanized hubs of the entertainment software industry like Los Angeles and Boston. While central Maryland has signs of suburbanization everywhere — a light rail line serves a recently redeveloped retail center and an office park where McCormick and Co. has a manufacturing facility — it has retained a lot of the rural character and quality of life that has kept people like Douglas Whatley here.

Not much has changed about Hunt Valley since Whatley moved here in 1990 to work at MicroProse. He now runs his own game development company, BreakAway Ltd. "It has always been an outpost where a few national companies set up outside of Baltimore," says Whatley. "But we are still right in the country. This is horse country with mostly farms."

A New Mass Medium

The earliest computer games have their origins at research universities and institutions. They were often by-products of serious work being done by computer scientists.

For example, a programmer at the Massachusetts Institute of Technology, Steve Russell, used a mini-computer called the PDP-1 to develop one of the first widely played games — *Spacewar!* The game was so popular at an MIT science open house in 1962 that Digital Equipment Corp. included a copy with every PDP-1 it shipped.

Still, gaming was a labor of love, both for players and developers. You could play games only on certain computers, and those computers were many times more complicated to operate than the smartphones today's teenagers use to play *Angry Birds*.

If you made games, the distribution options were limited. You could copy your work onto floppy disks and peddle them at mom-and-pop stores and hobbyist conventions. Or, you could post games on online forums

A stack of MicroProse's software titles sits in the offices of Firaxis Games, one of MicroProse's successful offspring.

PHOTOGRAPHY: CHARLES GERENA

frequented by computer hobbyists, as Whatley did. While working as a programmer in the financial industry, he started developing freeware games on the side and posted them on the CompuServe and AppleLink online services.

The entertainment software industry wouldn't become a mass medium until technological platforms for playing games became more standardized and user-friendly and until distribution channels appeared. A college student's encounter with *Spacewar!* proved to be a pivotal moment in this evolution.

Nolan Bushnell saw the game running on a PDP-1 while attending the University of Utah, a center of computer science research. Bushnell became obsessed with finding a wider audience for it. After graduating in 1969, he built and marketed a coin-operated version called *Computer Space* for college campuses and bars starting in 1971.

The game was a commercial failure because, while it was novel and looked futuristic, it was hard to play. The company Bushnell co-founded in 1972 — Atari — would make its mark selling simpler arcade games like *Pong*. Later, he brought *Pong* into people's living rooms in the form of a device that could be connected to a television set.

But first, Magnavox beat Atari to the home video game market by introducing its system, the Odyssey, in August 1972. Fairchild Semiconductor followed four years later with the first system to use interchangeable game cartridges.

"This was the first real experience that the public had with a computer or an electronic toy," explains Christopher Melissinos, former chief gaming officer at Sun Microsystems and curator of a recent exhibition on the history of computer and video games at the Smithsonian American Art Museum. "You can trace the adoption of [home] computers to these first home video game machines."

Once the Odyssey and *Pong* came out, says Melissinos, "it was a quick acceleration from that point forward." In October 1977, Atari released its Video Computer System, known later as the Atari 2600, which could be produced more cheaply than rival systems and used a joystick on a base. The system provided a simple but flexible platform that could reach a mass audience. "Designers, through their ingenuity, were able to bend the machine to do things that its creators never thought possible," notes Melissinos.

As a result, the market became flooded with new games for the Atari 2600, as well as for subsequent cartridge-based systems like ColecoVision and Intellivision. The sudden influx almost killed the industry. Parents faced a wall of games to buy for their children and had no idea which ones were good or bad by looking at the boxes.

"All of these businesses jumped in and created games that were terrible," says Melissinos. "There were no standards around advertising or describing what the games were."

By the early 1980s, consumers started walking away from home video game systems, right around the time that more powerful personal computers like the Commodore 64, Apple II, and Radio Shack's TRS-80 offered a way both to play games and to use other productivity software like word processors. "The bottom fell out of the market," says Melissinos. "A lot of people assumed that video games were just a fad."

That didn't turn out to be the case. Nintendo entered the U.S. market in 1985 with its video game system. Thanks to the popularity of games like *Super Mario Brothers*, the company revived the video game side of the entertainment software industry. To ensure quality control, Nintendo signed licensing agreements with game publishers and added a security chip to its system to lock out unlicensed cartridges. Sega introduced its video game system in 1986 based on the same business model.

Clustering in Horse Country

As the entertainment software industry worked through its growing pains in the 1980s, clusters formed where the most successful game developers and publishers were headquartered. Spinoffs spread the expertise of these firms, serving as fertilizer that helped the industry take root.

Northern California's video game cluster can be traced back to the establishment of publishers like Electronic Arts, which released blockbusters like *The Sims* and *Rock Band*. Seattle's cluster has its origins in Nintendo of America and Microsoft, publisher of *Flight Simulator* and producer of the Xbox. In Austin, Texas, the cluster began with Origin Systems, which was founded in 1983 and produced the *Ultima* and *Wing Commander* franchises.

In Maryland, two computer game development companies established the East Coast roots of the entertainment software industry. Bethesda Softworks was founded in 1986 by Christopher Weaver, an MIT-trained computer scientist. The company's initial claim to fame was the introduction of sports games that relied on real-world physics to determine the outcome, not a set of rules based on stat books. It also released several popular role-playing games for both computers and video game systems, including *Elder Scrolls*, before being absorbed into ZeniMax Media, which is based in Rockville, Md., and has offices in Hunt Valley.

MicroProse began in 1982 with $1,500 in startup money and an office in Sid Meier's basement. Meier had moved to Hunt Valley from Detroit to work as a programmer at General Instrument. Developing code for cash register networks during the workday, he played and created games on the side. During a trip to Las Vegas, Meier played a flight simulator arcade game with his friend Bill Stealey, a former Air Force pilot who worked in General Instrument's business development department. Meier managed to beat Stealey by figuring out how the game worked.

Could they build a more challenging game that was also fun to play? The duo decided to find out.

MicroProse started out small. At first, Meier and Stealey focused on combat flight simulators and military strategy games for early PCs like the Atari 800 and Commodore 64, distributing them on disks stuffed into baggies. Eventually, MicroProse would release several best-selling and critically

acclaimed games, including *Railroad Tycoon* in 1990 and *Civilization* in 1991.

By that time, startups had begun spinning off from MicroProse as people left the company. Former developers founded Firaxis Games, Big Huge Games, and BreakAway, while a former executive started testing firm Absolute Quality. Other firms opened to take advantage of MicroProse's talent pool, including Day 1 Studios.

The Power of Clustering

MicroProse may have yielded a bumper crop of offspring, but something else sustained the area's game development ecosystem to help those companies survive. In Maryland, "we have a lot of government and Department of Defense money that funnels into here" from places like the National Security Agency and the Aberdeen Proving Ground, says Whatley of BreakAway. "When we had downtimes, we were able to get contracts to do work for them."

In addition, Uncle Sam has been a source of talent for central Maryland's gaming cluster. "A lot of us drew people out of the government," notes Whatley. "If there was a really hot programmer that was working at the National Security Agency and got bored with that and wanted to work in the games, we could snap him up easily."

There are other advantages of having game developers clustered in one area, such as Baltimore County and Montgomery County. The agglomeration of firms in a similar industry yields localization economies, in contrast to urbanization economies that result when any group of companies cluster in one place.

Localization economies come in three flavors. First, there are knowledge spillovers. While computer programmers tend to do their best brain work independently, they also benefit from being near others who can serve as sources of collaboration, inspiration, and market information.

Mathijs de Vaan, a Ph.D. fellow in Columbia University's economic geography department, studies the beneficial effects of social networks — not the Facebook variety but the kind that form between members of the same creative team or within the same industry. DeVaan has recently focused his attention on the entertainment software industry. "Technology products such as a video game contain a lot of ideas," he describes. "In order to generate those ideas, face-to-face contact and exposure to diverse groups of individuals are important."

In the case of Hunt Valley, lots of game developers reportedly moved to the region to get the chance to work with Meier and Stealey. They continue to be mentored by former MicroProse employees today.

Labor pooling is another localization economy that can occur when an industry cluster forms. "A successful company can hire the workers from an unsuccessful company," says William Strange, a professor of real estate and urban economics at the University of Toronto. This is good for both sides of the job market. "Workers benefit from having a stable demand for their labor. Firms benefit from being able to expand when they need to."

Bryan Reynolds is a good example of someone who has hopscotched from one game developer to another without leaving Baltimore County. Reynolds started with MicroProse, left the company with a bunch of other people to form Firaxis Games in Sparks in 1996, then left that company to co-found Big Huge Games in Timonium four years later. He now designs online games for Zynga East in Timonium.

When new talent is attracted to a region with employment opportunities, that's another benefit of labor pooling. The cluster of game developers in Hunt Valley has attracted students from The Maryland Institute College of Art in Baltimore. Over the last decade, according to Doug Whatley, the region has also lured back students who had moved out west to work at software and game developers.

The advantages of labor market pooling are especially acute when the work requires specialized knowledge. In the early days, computer and video games were crude enough such that the developers did all the things needed for the game, from composing the music to designing the backgrounds. Each leap in technology has given developers new tools to create richer environments for players, pushing the limits of storytelling and audience engagement. This has required a unique skill set that includes equal parts of creativity and math.

"Game development requires both left-brain and right-brain skills," says Deborah Solomon, coordinator of the computer gaming and simulation program at Montgomery College and a former game developer for the National Oceanic and Atmospheric Administration. "Companies like to hire people that have not just the programming skills but the creative design skills."

At the same time, as games have become more sophis-

The Art of Video Games ***exhibition in Washington, D.C., highlighted milestones in the design of games like*** **Super Mario Brothers,** ***which helped the industry recover from a mid-1980s slump.***

PHOTOGRAPHY: *SUPER MARIO BROTHERS 3*, SHIGERU MIYAMOTO, TAKASHI TEZUKA, HIROSHI YAMAUCHI, DIRECTORS; SATORU IWATA, EXECUTIVE PRODUCER; KONJI KONDO, COMPOSER. NINTENDO ENTERTAINMENT SYSTEM, 1990. NINTENDO OF AMERICA, INC.

ticated and complex, there has been greater specialization and dispersion of tasks in the entertainment software industry. According to Solomon, large game development teams may require programmers that aren't involved in the design. For example, someone may be needed just to develop and run the database that stores the inventory of items that players have accumulated in an online role-playing game.

The sharing of specialized inputs is the third type of localization economy. That may be less important in the game industry, however, than in some other industries, according to Strange. "It's not obvious to me what inputs would be shared." He suspects they may use the same lawyers or accountants, but neither is particularly geared toward the entertainment software industry.

Game developers occasionally fill holes on their development teams by hiring specialists in areas like sound production or graphics rendering. But such outsourcing doesn't happen often. At both BreakAway and Firaxis, the back-and-forth of the creative process works better when everyone working on a project is in the same office.

The Future

The entertainment software industry appears to have come full circle. Now that individual game developers can submit their work for posting on Apple's App Store or Google Play, they can attract a following like Doug Whatley did when he posted games on CompuServe decades ago.

As a result, a number of smaller, independent companies have popped up, says Solomon. "It's like a new renaissance of the small indie game companies, kind of like it was the 1970s and '80s."

Game developers have come full circle in another way, according to Whatley. Developers that used to test their products on multiple configurations of IBM's PC are now doing the same thing for smartphones and tablets that run on multiple operating systems. "It's all played out before," he adds.

These changes will keep central Maryland's game developers and publishers on their toes. Some firms may contract while others may expand. So far, the region's cluster has held up. Big Huge Games shut down last May and could have left about 100 people out of work. Instead, many of them have been employed by Impossible Studios, a new outfit opened in Hunt Valley by Cary, N.C.-based Epic Games in August 2012.

"It is one of the most exciting and also one of the most frustrating things about game development — it's never the same," says Solomon. **RF**

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Though questions remain about whether vocational or general education yields more benefits to the individual and the economy, it's not an either-or, but a dual system. As Gill of the Chesterfield Technical Center notes, "If a student wants to go to work, we help them, but we want them to go on and get as much education as possible." That higher education includes not only four-year colleges but also trade, technical, and community colleges. "We want students to broaden their skill set and certifications."

Garcia, the automotive technician, is 26 now. The apprenticeship got him started, and now he's back in school while still working, earning his associate's degree in mechanical engineering because he'd like to work at the corporate level at Toyota or Lexus.

He's adding to his skill portfolio. Probably not for the last time. **RF**

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