

Biography of a Software Engineer - John Romero

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John Romero's work was the beginning of so many things. His work spawned an entire genre in computer games, with the first-person shooter genre now a multibillion-dollar business. In the course of 5 years, with a small team of 10 people, Romero created over 28 games, several reaching more than a million plus units sold. Romero now finds himself in Galway, Ireland. But why did Romero decide to nestle down in Galway? To quote himself "We'd been here for 24 hours" and realized "that Galway is the friendliest place in the world." In general it seems that gaming is rather popular, especially in comparison to other countries around the world. To put things into perspective, Ireland has the second highest per capita of PlayStations in the world. And who exactly is John Romero? Well to find out who he is we must start at the beginning.



*John Romero
-Former Twitter Profile-*

John Romero was born in Colorado Springs, Colorado in the United States on the 28th of October, 1967. The Arcade Games, Space Invaders and Pac-man were his first introduction to gaming and were ultimately what got him "thinking about game design". Romero began his career in programming by creating a string of short games on the Apple II all self-taught: *"I started creating games in 1979 and got my first real programming job at Origin Systems in 1987. I am completely self-taught, no school."* These games garnered him some notoriety, with his games featured on the December cover of popular Apple II magazine *Nibble* for three consecutive years.

After 8 years of creating games in his spare time, Romero eventually landed a job at Origin Systems where he worked on porting games from the Apple II to the Commodore 64. Over the next few years Romero would see himself joining and leaving various companies, culminating in his co-creation of *id Software* together with John D. Carmack, Adrian Carmack and Tom Hall.

Romero would work at id for a little over five years. While there he would create his most impactful work to date, ultimately leading to some of the greatest milestones in gaming history. Among some of his most popular achievements include, *Doom*, *Commander Keen*, *Wolfenstein 3D*, *Doom II: Hell on Earth* and *Quake*.

id Software, Doom & Quake:

id Software would go on to see a sudden uptick in extreme success, both financially and culturally with their first release, "*Wolfenstein 3D*". Id Software's next several releases would all go on to be colossal hits, with *Doom* in particular gaining a lasting cult following. Romero's primary work on the projects revolved around the tools used at id Software to create their games, including the *Doom Engine*; the *doom level editor*, which I'll discuss further in my biography, *QuakeED*; similar to the *Doom Engine* but with a few tweaks, and *Deathmatching*; used for deathmatch launching, which would go on to create an entire separate genre of gaming.

Some more honourable mentions for technologies created by Romero and id Software include

- DWANGO client (to connect the game to DWANGO's servers),
- TED5 (level editor for the Commander Keen series, Wolfenstein 3D: Spear of Destiny),
- IGRAB (for grabbing assets and putting them in WAD files), the installers for all the games up to and including Quake,
- the SETUP program used to configure the games,
- and several others.

This would go on to be known as the Golden Era of id Software, or as Romero coined it in his WeAreDevelopers Conference in 2017, the *Turbo Mode period*, in which he emphasizes having created 28 games, in 5.5 years with a team consisting of fewer than 10 developers.

Technology Innovations:

1. Doom Engine / Quake Engine:

The most influential of all technologies to come out of id Software has to be the Quake Engine. Still used today, the Quake Engine is based on the original Doom Engine and has seen it's involvement in many titles, gaming and non-gaming. To demonstrate this, here is a video showcasing some of the creations still used by the Doom Engine today: *Evolution of Doom Engine Games 1993-2016*:

https://www.youtube.com/watch?v=qb3_fG2nKfQ

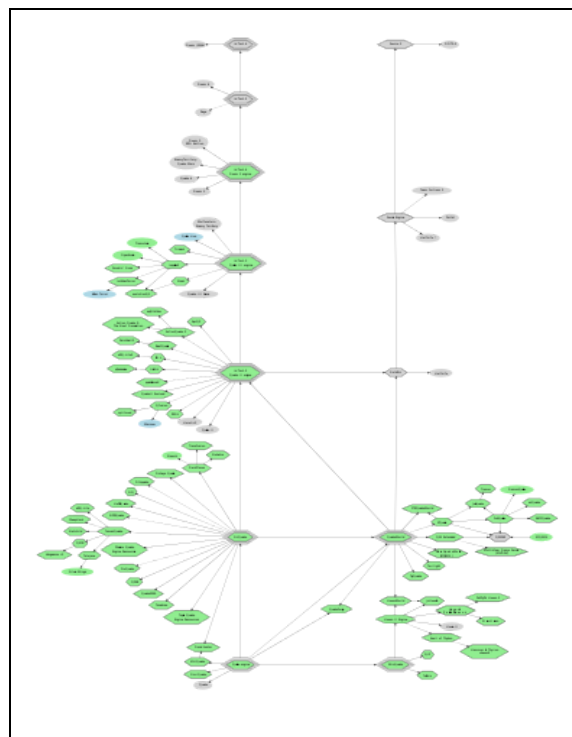
Of course the engine is still used by id Software only advanced, with the original version called id Tech and the current version called id Tech 5.

The engine was one of the first to popularise the use of [binary space partitioning](#), a tool used to generate the level beforehand allowing for smooth gameplay. Essentially the level is based on a Binary Tree, with each node in the tree representing an area of the level, and leaves of the node representing complex polygons or structures. The engine then used the [Scanline algorithm](#) for quick level rendering.

To quote Eurogamer.net: "*id Software has been synonymous with PC game engines since the concept of a detached game engine was first popularised.*"

Github Link to the Doom Engine Source

Code: <https://github.com/id-Software/DOOM>



Quake family tree, showing games and engines based on the Quake engine.

Source:

https://upload.wikimedia.org/wikipedia/commons/thumb/8/85/Quake_-_family_tree_2.svg/370px-Quake_-_family_tree_2.svg.png

2. Open Source Contribution

Since the beginning, Romero has also made large contributions to Open Source, especially on projects involved with John Carmack. Romero and Carmack have often voiced their opposition to Software Patents, claiming that they're similar to Robbery. Contributions they have been involved in include beginning the initial port of the X Windows System to Mac OS X Server, and work on improving the OpenGL drivers for Linux, through the Utah GLX project. Romero has also made his own software free also, with the source code of most games and projects released usually 5 or so years after the initial release. Many initial copies of the original Doom game were released for free, where distributors were even allowed to create their own cover of the game, allowing for many unique designs to be made. Currently many contributions have been made to the original projects, all licensed under the [GNU General Public License](#) (GPL). These engines have also been licensed for use in other influential first-person shooters such as Half-Life, Call of Duty and Medal of Honor

3. Carmacks Algorithm

To go a little further in-depth on exactly how id Software has contributed to the Software Engineering world, let's look at one of id Software's original creations, Carmacks Algorithm, created by Romero and John Carmack. Carmack's Algorithm specifically relates to how to create shadows in games. Instead of counting the shadow surfaces in front of an object's surface, the surfaces behind it can be counted just as easily, with the same end result. This solves the problem of the camera being in shadow, since shadow volumes between the camera and the object are not counted.

1. Disable writes to the depth and color buffers. Use front-face culling.
2. Set the stencil operation to increment on depth fail (only count shadows behind the object).
3. Render the shadow volumes. Use back-face culling.
4. Set the stencil operation to decrement on depth fail.
5. Render the shadow volumes.

This might be difficult to understand from a non-game dev perspective but to explain in layman's terms, it significantly decreases the runtime of rendering shadows in a game.

Carmack Algorithm is one of the many innovations to come out of the id Software's catalogue. Henry Lowood, a professor at Stanford University, (<https://venturebeat.com/2013/12/11/after-20-years-doom-co-creator-john-romero-looks-back-on-the-impact-of-a-seminal-game-interview/>) said that it and Doom gets credit for so many innovations — from multiplayer play to modding — that Doom should be known as the “beginning of the modern digital game.” Minecraft creator Markus Persson praised Doom for getting him into games.

Cultural Impact:

"We are at the point where game designers and programmers have become celebrities due to the size of the market they serve."

It's fair to say that of all games created by Romero, Doom has had the longest lasting effect by far. To date, the original Doom has sold over 10 million units and spawned numerous sequels, novels, comic books, board games, and film adaptations with the most recent sequel, Doom: Eternal releasing this year with over 3 million copies sold in March despite the COVID-19 pandemic.

Interestingly enough, the original Doom game has generated a large cult-like following, with creative fan-made work showcased every day on the internet. A recent trend in the 'Doom-sphere' has been the 'can it run Doom' trend. Programmers will find as unique a machine as they can and use Doom ultra portability to run the game. Some famous examples include an ATM Machine, a printer and even a pregnancy test (Running Doom on a Pregnancy Test: https://www.youtube.com/watch?v=KylITTyRX_rk):



To the left of this paragraph you'll see a joke video about running Doom on an Etch-A-Sketch, which has amassed over 13 million plus. Can it run DOOM?: (13 million views):

<https://www.youtube.com/watch?v=VnmIXK3PYFw>

In general, most videos featuring John Romero usually accumulate over 1 million plus views:

https://www.youtube.com/watch?v=9v_0HD7iOz4

Many Romero memes also exist, usually callbacks to interesting tid-bits and easter eggs to the original game. A popular one is

this(https://static.wikia.nocookie.net/doom/images/a/a0/Romero_head.PNG/revision/latest/scale-to-width-down/340?cb=20090214021534)hidden image of Romero's head which upon sight utters the reverse phrase *To win the game, you must kill me, John Romero!*

Outside of Gaming and Technology, Romero has also shown his support for social issues, including appearing in Harris Hbomberguy's Donkey Kong Twitch Stream (<https://www.youtube.com/watch?v=AXh2hhz6Kol>) which garnered over \$300'000 for LGBT+ youth.

I might have a little bias towards Romero however as I've met the man behind the computer. Last year, at the beginning of September, working with the DUCSS Committee a talk was organised in the Lloyd Lecture Theatre for Romero to give a talk on Game Design. During the talk, Romero went into detail on his growth as a developer, Doom's success, the computer science behind id Software's Games and the projects he's worked on recently.



Romero and the DUCSS Committee in the DUCSS Room: <https://ducss.ie/>

Conclusion

To sum it all up, I have great respect for John Romero. In interviews, he speaks quite a lot about the difficulties he would run into with tight deadlines, such as how the deadline for the creation of one of their engines was one whole year behind schedule. Romero seems to be able to pull a team together in dire situations and pull through as he remains focus on his passions for games and programming creation.

Further Reading and Other Sources:

John Romero Former Twitter Profile Picture:

https://pbs.twimg.com/profile_images/1298240799910563842/37Zf8RSH_400x400.jpg

Official DUCSS Website: www.ducss.ie

John Romero's Irish Adventure: <https://www.youtube.com/watch?v=AJqWA3UPsPg>

Meet John Romero: One of the Godfathers of the First-Person Shooter:

https://www.youtube.com/watch?v=9v_0HD7iOz4

Wikipedia Article on John Carmack:

https://en.wikipedia.org/wiki/John_Carmack#Open-source_software