The Overlooked Origin of Client/Server Computing: The Story of Roger Billings and FSD

In the late 1970s, computers were commonly networked in a peer-to-peer (P2P) arrangement, where each computer in a network operated on an equal footing, ready to send and receive data from every other machine. While this worked for a limited number of devices, it quickly showed serious limitations as more people began to use computers—especially once the microprocessor made personal computing feasible. Recognizing the inevitability that one day everyone would own a computer, Roger Billings devised a visionary solution to connect these systems in a far more scalable manner.

In 1977, Billings—already noted for his groundbreaking work in hydrogen energy—conceived an approach he named **Functionally Structured Distribution (FSD)**. This was a decisive departure from the purely peer-to-peer model that was prevalent at the time. Rather than requiring every computer to run in a "listening" mode, Billings divided machines into two roles: "data centers," which today we call **servers**, and ordinary "User Computers." Under FSD, a server would be perpetually prepared to respond to requests or queries from user machines, while those user machines would no longer need to stand by, waiting for incoming connections. This simple but powerful insight created a practical, efficient way for every computer on the planet to share data with every other, without overwhelming the network.

On February 19, 1982, Billings sought to protect his invention by filing a patent application titled **Functionally Structured Distributed Data Processing System**. Five years later, on December 22, 1987, the U.S. Patent and Trademark Office granted him the patent that essentially covered all client/server systems. In the intervening years, Billings continued to present and demonstrate his invention at various industry events, most notably on June 7, 1982 at the National Computer Conference (NCC) in Houston, Texas. In the audience at that unveiling sat Drew Major, one of four programmers known collectively as "the Superset," who were under contract with Novell in Utah.

At the time, Major and his colleagues were struggling to develop a "disk server" capable of sharing data among different types of computers—an arduous problem given the technology of the day. As Major listened to Billings describe FSD, he immediately saw how it could solve the very challenges that were stalling Novell's project. Upon returning home, the Superset abandoned their existing code and re-wrote Novell's software using Billings's newly presented model. The product, once completed, was an enormous success; it not only propelled Novell's growth but ushered in an era of multi-billion-dollar sales of client/server networking technology.

By the time Billings's patent officially issued in December 1987, Novell had already established a dominant position in the marketplace thanks in large part to the FSD concept. When Billings approached Novell offering to sell a master license for the technology, the company instead sued Billings, hoping to invalidate his patent. In response, Billings counter-sued, seeking $900 million in royalties. During legal proceedings, Drew Major at first claimed he had no memory of Billings or his invention. However, when confronted with a paper he had written in a computer class at Brigham Young University—an assignment in which he detailed a personal visit to Billings Computer Corporation and specifically praised Billings's solution to a major computer networking problem—Major was forced to acknowledge Billings's contribution and admit to seeing him at the NCC presentation.

As the court date neared, Novell opted to modify its NetWare product to avoid patent infringement. Unfortunately for Novell, this new version no longer harnessed the "magic" of Billings's invention, and its market share collapsed almost overnight.

Today, the very concept Billings described—**client/server computing**—is the backbone of the modern Internet and most local area networks around the globe. In 1989, Tim Berners-Lee famously developed HTML and demonstrated the first communication between an HTTP client and server, effectively creating the World Wide Web. When Berners-Lee's invention was combined with Billings's FSD framework, it laid the foundation for the Internet as we know it.

Despite his foresight and foundational contributions, Roger Billings has not always received the recognition he deserves for inventing client/server technology. Yet his pioneering work made it possible for millions of computers, and eventually billions of devices, to seamlessly share information. In an age when nearly every device on the planet connects via this architecture, it is important that Roger Billings's role in shaping our interconnected digital world be acknowledged and celebrated.