

# We've got mail: Q&A with the inventor of e-mail

Posted on July 27, 2016 by CertMag Staff

*This feature first appeared in the Summer 2016 issue of Certification Magazine. **Click here** to get your own print or digital copy.*

**Some things are so foundational** to our conception of the world we live in that we don't often (if ever) think to question where they came from. When, for example, is the last time you had a discussion about the inventor of the house?

Every commonplace modern convenience, on the other hand, came from somewhere. At the beginning of some backward-reaching chain of events is a person or persons who had the first idea, or devised the first mechanism, that led to the familiar and accepted whatever-it-is of 2016.

Though related technologies like texting have begun to rival and even surpass it, e-mail is still a foundational convenience of modern living.

An e-mail address is something we naturally assume that everyone has and uses. Communication via e-mail is a vital and integral part of modern business.

So let's ask the never-asked question: Where did e-mail come from? Does it have an inventor? The answer is "Yes." There is an inventor of e-mail, 52-year-old U.S. citizen V.A. Shiva Ayyadurai, and *Certification Magazine* was fortunate enough to get a few minutes of his time.

We actually got more out of our interview than we have room for in print. So if you like what's presented S here, then keep a sharp eye on CertMag.com. The full-length Q&A will be posted there July 27.

**Formatting Note:** For most of this article, we have used AP Style for the term "e-mail," which includes a hyphen. As you will learn, however, that is not, for very specific reasons, how the word was first formulated (or copyrighted) by V.A. Shiva Ayyadurai.

**Q:** Your family came to the United States when you were seven years old. Why did they relocate?

**A:** My parents, Meenakshi and Vellayappa Ayyadurai, had relatively comfortable jobs in India. Most Indians in their position would likely have stayed in India, rather than emigrating to a new country with many uncertainties.

What motivated my parents to relocate to the United States was they realized that there was a low ceiling for advancement in India on many levels, particularly regarding their children's education. So, in 1970, with \$75.00 in his pocket, my father moved his young wife and two small children to the United States to pursue the American Dream.

**Q:** What was the root of your interest in information technology?

**A:** My interest in IT began with a love of mathematics. By the time I was 13, I had finished Calculus and my school had no other math courses to offer. I heard from my mother's friend, Martin Feuerman, about a special program in Computer Science being offered at Courant Institute of Mathematical Sciences at New York University (NYU), where 40 students across the United States would be selected.



V.A. Shiva Ayyadurai

I was one of the fortunate students to get selected and was given the opportunity to learn six different programming languages: COBOL, FORTRAN, SNOBOL, PL/1, BASIC, ARTSPK. In addition, we were taught a course in advanced digital hardware. The experience at NYU got me interested in IT.

Q: At age 14, you were working at the University of Medicine and Dentistry of New Jersey. How were you singled out at such a young age to get that position?

A: After I finished the program at Courant Institute of Mathematical Sciences at New York University (NYU), my mother, Meenakshi Ayyadurai, was excited to see that I had an aptitude for new technology and she introduced me to Dr. Leslie P. Michelson, who taught at University of Medicine and Dentistry of New Jersey (UMDNJ), in Newark, N.J.

Dr. Michelson and I had our first meeting, and we both liked each other and there was great mutual respect. He could see that I was seeking to be challenged and had skills that could be utilized. So he challenged me to find a solution to an office technology problem: to convert the interoffice/inter-organizational mail system (inbox, outbox, folders, attachments) to an electronic version.

I accepted the challenge and was hired as a full time Research Scholar with no pay, but given free lunch in the cafeteria, which was a big deal for a teenager. The following year, I was promoted to Research Fellow and paid \$1.25 per hour. That is how I started working at UMDNJ.

Q: So what became of Dr. Michelson's challenge to upgrade and digitize interoffice communication?

A: First, I studied how the existing system processed and transported paper mail between offices and dispersed it in separate locations. Then I set out to duplicate all of the features of the interoffice mail process in a computer program. I worked in the lab nearly every day, and then in the evenings at home on our kitchen table until 2 a.m.

In the end, I wrote nearly 50,000 lines of code to design and implement an electronic version of the mail system. What resulted was that I created the electronic interoffice paper mail system. And UMDNJ, a small school in an impoverished city, was its first customer.



This electronic interoffice mail system had the following interlocked parts, which are the now-familiar components of e-mail: Inbox, the Memo (“To:”, “From:”, “Date:”, “Subject:”, “Body:”, “Cc:”, “Bcc:”), Forwarding, Composing, Drafts, Edit, Reply, Delete, Priorities, Outbox, Folders, Archive, Attachments, Return Receipt, Carbon Copies (including Blind Carbon Copies), Sorting, Address Book, Groups, Bulk Distribution.

This system was not only used within offices but also for communication between different organizations. But that was not all. The database-driven and modular architecture of this system ensured reliable and secure transfer as well as providing many of the other important interoffice mail features aforementioned.

I called my program EMAIL. I selected this name for the very idiosyncratic reason that, in 1978, FORTRAN IV only allowed for a six-character maximum variable and subroutine naming convention, and the RTE-IV operating system had a further five-character limit for program names. Placing the “E” in front of “MAIL”, which may seem obvious today, was not in 1978.

The term “email”, the juxtaposition of those five characters e, m, a, i and l, did not exist prior to 1978. The naming of the software program EMAIL in all capitals was because at UMDNJ, the names of software programs, subroutines and variables written in FORTRAN IV used the upper-case naming convention.

Moreover, at that time, the use of upper case for the naming of programs, subroutine and variable names, was also a carryover from the days of writing software programs using punch cards. The fact is EMAIL is email, upper case, lower case, any case.

On Jan. 21, 1981, I received a Westinghouse Science Talent Search Honors Award for creating e-mail. On Aug. 30, 1982, the United States government recognized me legally as the inventor of e-mail by issuing the first copyright for e-mail, at a time when copyright was the only way to protect software inventions, since it was not until 1994 that U.S. courts began recognizing patents for software.

In 1978, my experience as a teenager in New Jersey, however, reveals an alternate narrative. Innovation is the human condition. It is in our DNA. It is why we have fire and the wheel and irrigation and writing. It is not the privileged domain of a coterie at elite institutions and corporations, too many of which play the role of restricting innovation to protect their vested interests.

I believe these vested interests sometimes resort to rewriting history and subsuming terms to either intentionally or unintentionally belittle “others” whose work did not take place under their auspices. You may read more about how the invention of e-mail came about **here**.

Q: Systems for transferring messages between networked computers had been around before 1978. How was your application different?

A: Electronic messaging dates back to the 1800s when electricity was used to send messages. The telegraph was used to send short text messages, but that is not e-mail. In the 1930s, radiotype was used to send text messages, but that is not e-mail. In the early 1960s, the computer was used to send simple text messages. That, too, is not e-mail.

What is e-mail? E-mail is the system, the platform that I was the first to create in 1978, which was intended to be the electronic version of the interoffice mail system which consisted of Inbox, Outbox, Drafts, the Memo (To:, From:, Subject:, Cc:, Bcc:), Attachments Address Book, Carbon Copies, Registered Mail, ability to forward and broadcast along with a host of other features — the now familiar parts of every e-mail system, that users take for granted in e-mail programs such as Gmail and Hotmail.

Not only did I create this first system, but I named it “email,” a term I was the first to create and one that was not used in the English language before. By the fact I called it “email” and was the first to create the system that had all the features which appear in every e-mail system today, I invented e-mail.

The simple exchange of text messages between computers is not e-mail. For example, if one closely looks at what Ray Tomlinson did, he modified an existing program SNDMSG (which he did not write) that was a local user electronic “Post-it note” system, using borrowed code from CPYNET (which he did not write), a file transfer protocol.

His modification allowed a user on one computer to append text to a file on another computer. The user had to type in cryptic commands to even make this happen. It’s caveman Reddit, not at all what we know as e-mail. I wrote nearly 50,000 lines of code to emulate the whole interoffice mail system, the e-mail we all know and use today.

Moreover, even as late as 1977, the record shows that the invention of electronic messaging was of no interest to Tomlinson or the Advanced Research Projects Agency Network (ARPANET) in 1977. A seminal RAND Corporation report summarizing the state of electronic messaging in 1977 concluded that:

*“ ... no attempt is being made to emulate a full-scale, inter-organizational mail system ... The fact that the system is intended for use in various organizational contexts and by users of differing expertise makes it almost impossible to build a system which responds to all users’ needs.”* (David Crocker, “Framework and Functions of the MS Personal Message System,” RAND/R-2134-ARPA, Rand Corporation, December, 1977)

You can read more about the various false claims people have made about e-mail **here**.

Q: You received several patents for this invention. What are they?

A: In 1981, as a 17-year-old, I complied with the laws of the land, pursuant to the Computer Software Act of 1980, that allowed me to protect my invention using copyright. It was not until 1994 that the United States Court of Appeals for the Federal Circuit ruled that computer programs were patentable as the equivalent of a “digital machine.”

Before that, copyrights were the primary mechanisms of protection, making computer programming code equivalent to sheet music or art. In 1982, I was awarded the first U.S. copyright for “email,” “computer program for electronic mail system,” by the U.S. government, legally recognizing me as the inventor of email. This was Certificate of Registration, No. TXu-111-775. In addition, I also received a second Certificate of Registration, No. TXu-108-715, for the “EMAIL User’s Manual.”

I also continued my work in e-mail technologies by creating advanced methods for automatically filtering and responding to e-mail, based on my work with the White House to help President Clinton’s Executive Office manage their growing volume of e-mail in 1993.

In 2003, I was awarded U.S Patent #6,668,281 for Relationship Management System and Method using Asynchronous Electronic Messaging, and in 2004, more than 25 years after creating the world’s first e-mail system, I was issued U.S. Patent #6,718,368 for inventing a method for automatically analyzing an e-mail and formulating a response.

Again, in 2014, I was awarded U.S Patent #6,718,367 for Filter for Modeling System and Method for Handling and Routing of Text Based Asynchronous Communication.

Q: As with all world-changing scientific breakthroughs, there are critics and counter claims. What do you have to say to the claim that “EMAIL” isn’t “-email” as we know it today?

A: First of all, I am not making a claim. I am the inventor of e-mail. The facts are black and white. If I were (actually) white, and I had the following evidence — the actual computer code for creating the first electronic version of the interoffice mail system (Inbox, Outbox, Attachments, Memo, etc.), and named it “email”, and had the first U.S. Copyright legally recognizing me as the inventor of email — I would be on every stamp and in every history book across the world.

In 1978, in all computer programs written in FORTRAN, all program names were in upper case. I was the first to create the word “email,” upper case or lower case. It is absurd to say upper case “EMAIL” is different than lower case “email” (or “e-mail”) just like it is absurd to say that upper case “DONKEY” is different than lower case “donkey.”

As MIT Institute Professor of Linguistics, the world-renowned Noam Chomsky said in a *WIRED* magazine interview in 2012, “What continue[s] to be deplorable are the childish tantrums of industry insiders who now believe that by creating confusion on the case of ‘email,’ they can distract attention from the facts.”

As Professor Chomsky also stated, “Email, upper case, lower case, any case, is the electronic version of the interoffice, inter-organizational mail system, the email we all experience today — and e-mail was invented in 1978 by a 14-year-old working in Newark, N.J. The facts are indisputable.” The real question is, given that the facts are so black and white, WHY is there so much hatred, anger and false claims being repeated to confuse and diminish the facts?

Q: E-mail today is so ubiquitous that it’s entirely natural for a U.S. Secretary of State to have an e-mail account, and for there to be actual government protocols regarding its use. When you created e-mail, in your wildest dreams, did you ever think it would become as widespread and commonplace in modern life as it is today?

A: Yes, in retrospect, as a teenager when I invented email, I had a very clear vision of the future of email. Here is a extract from an essay I wrote in the early 1980s:

“When Thomas Alva Edison invented the light bulb, he never perceived that his invention would have worldwide attention and acclaim; however, it has. The light bulb is an integral part of our daily living. One day electronic mail, like Edison’s light bulb, may also permeate and pervade our daily lives. Its practical applications are unlimited. Not only is mail sent electronically, but it offers a computational service that automates a secretary’s or file clerk’s work of writing a memorandum, document or letter, editing, filing and retrieving.”

Q: What do you think about free e-mail in general? Should we purchase e-mail accounts from a licensed provider or go with the free-mail providers?

A: Whether it is “free e-mail” or paid accounts, remember that your information is stored on servers and computers which are not in your control. From that point of view, it does not make any difference to your data privacy. Ultimately, it is up to the user to make the call. To be really secure,

it is better to have a private e-mail server that you can control but you have to go through the technicalities of operating one and keeping it secure.

You can read the essay I wrote on this topic [here](#).

Q: Most e-mail is provided free by Google or Microsoft. In your opinion, should users of “free-mail” expect that providers have an obligation to not turn their e-mails over to the NSA? Is there an implicit contract between providers and users?

The truth is, there is no “free” e-mail. Private companies own your e-mail. This is why I have argued that the postal services should offer a protected public e-mail service. You can read more about this in the **essay I wrote**. Private companies can do whatever they want with your email, including turning it over to the NSA. Don't be naive.

Q: Privacy is a huge issue in the IT world. Do people give up their right to privacy when they use social media or e-mail?

A: Legally, when you accept the terms and conditions of any e-mail provider, you do give up control on much of what you might consider private information. The same is the case with social media, and more so because you are much more open to the world.

Q: Is e-mail as secure as we like to think? How hard is it for a hacker to read e-mails?

A: Better encryption methods have made e-mail much more secure than what it used to be. However, no encryption is totally foolproof. If you are connected, there could always be a way of bypassing security and encryption. That is a fact.

Q: What do you see for the future of email? Will texting and snapchat, instant messaging, Facebook/Twitter, Slack and other forms of communication replace traditional e-mail? Is there still a place for e-mail?

A: I have always said that e-mail will never die. When you look at the origins of e-mail, e-mail is the electronic version of the interoffice mail system. When people say e-mail is dead, they say that out of ignorance. With the coming of SMS, some people proclaimed, “E-mail is dead.” When Facebook and bulletin boards came along, people like Mark Zuckerberg also started making comments saying, “E-mail is dead.” Gmail originally provided just e-mail, then added chat (short messaging), and then began adding community messaging functions like Facebook, in Google Plus.

Facebook had chat but did not have e-mail. The day Zuckerberg said e-mail was dead was the same day Facebook was adding e-mail functionality! It is absolute insanity to say e-mail is dead, when the facts show e-mail volume continues to grow, and more commerce and business is done via e-mail than any other digital medium. For business people, the key is to recognize that e-mail is going to be here for a long time. In fact, e-mail is becoming more and more an acceptable part of formal communication. In the last five years, some European courts have ruled that e-mail can be used to issue warrants and summons.

Q: How many e-mail accounts do you have and how frequently do you use them?

I have a primary e-mail account that other company accounts feed mail into. I use another e-mail account for things like online purchases and so forth

Q: As the man who invented e-mail, we just have to ask: Who is your main e-mail account through?

A: I do not use a commercial e-mail account. We have a private e-mail server for the company and that is what I use.

Q: Which social network do you enjoy using the most — LinkedIn, FaceBook, Twitter, etc. — and why?

A: I do enjoy posting updates to my followers on FaceBook and Twitter and getting feedback and comments from them. LinkedIn provides a great social platform for networking.

Q: Google and others want to bring the internet to the entire world, and it's a commonly held belief that access to the internet and information have the power to transform a nation. In developing countries, is it better to create critical internet infrastructure or to build roads, dig wells, and so forth?

A: I firmly believe that both infrastructure and digital connectivity are equally important. It is not like one has to be at the expense of the other. Free access to information is critically important to innovation, and innovation is critically important for the development of any nation. What we need is a network infrastructure that is not owned by big companies, be it Google or other telecommunications providers. The future is citizen-owned mesh networks.

Q: Besides email, you've also created Arts Online (the first internet portal for artists), EchoMail (an enterprise platform for email and social media management), and CytoSolve (a company dedicated to revolutionizing drug development through in-silico modeling). What are you staying busy with these days?

A: Right now, my biggest project is **CytoSolve®**, which is revolutionizing medicine by providing an incredible way to create new medicines and validate ancient medicines of eastern systems of traditional medicine by computationally modeling complex molecular pathways on the computer. We've discovered a new therapeutic for Pancreatic Cancer without killing any animals, and are going after discovering new combination medicines for nearly every major diseases. CytoSolve is as big as a revolution to the field of Medicine as Email was to Communications.

I've also started **Innovation Corps**, a not-for-profit project to identify, mentor, and support young innovators in the age group of 14-18 across the globe. We just launched this year and identified 8 such innovators across the world.

Q: How do you relax? Any hobbies or favorite activities?

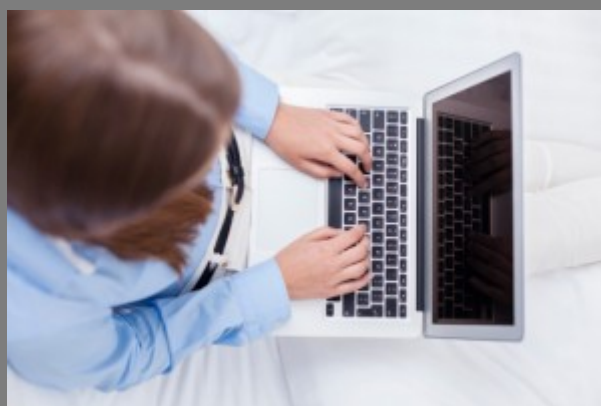
A: I love history because where we exist in time is a small slice of the human journey, and knowing history can be used to help us gain perspective to see the human experience in a much richer way. I really enjoy traveling and nature and wish I had more time to spend experiencing it. In this aspect, I'm into health, yoga, meditating and reconnecting with the earth and our indigenous cultures, who were far more advanced in many aspects than our modern technological culture.

Q: You participated in a ceremony with the actress Fran Drescher. What type of ceremony was it? How did you meet and are you still together?

A: Fran and I held a held a spiritual ceremony on Sept. 7, 2014 to celebrate our growing friendship in the midst of friends and family. However, we are not legally married as, at our age, we did not see any need to get the state involved in our personal affairs. We met at an event hosted by Deepak Chopra. I was speaking on sages and scientists — in fact, talking about innovation and the fact that we need to more universally look at the models of innovation. While I was on stage on another panel, I also made the comment that there are not enough women in science. Fran heard my talk and approached me. I had no idea who she was. Over the years, we developed a relationship which continues to evolve and grow.

Q: One last question: Besides pleasing your employer, was there any benefit to you for having invented email? Do you get any royalties?

A: No, I receive no monetary benefits from the invention of e-mail. You see, public policy in the 1970s had not caught up with innovation. I would be a gazillionaire now had patent protection been allowed in 1978, instead of copyright protection, for my invention. Patent not only protects the code, but the ideas (inbox, outbox, attachments, memo, etc.), and therefore I would indeed be getting a penny or so for every e-mail transmitted.



But that was not my goal as a 14-year-old, to make money, but the excitement to invent something no one else had done, and to make a contribution and just the sheer love of creation. For some people, in a society where money is so valued, this is part of the unconscious disbelief that a 14-year-old, dark-skinned, Indian immigrant kid in Newark, N.J., invented e-mail.

No one questions Bill Gates if he invented DOS. He made billions, is white, and dropped out of Harvard. I did not make a penny off e-mail, am brown, and created e-mail in Newark, N.J., one of the poorest cities in the United States. If one actually does their investigation, they will discover that Bill Gates did not invent DOS, but bought it from someone else and resold it to IBM.