

EXHIBIT D

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Origin of Email & Misuses of the Term “Email”

Abstract: The origin of email, the *system* as we all know and use today, begins in 1978 when a 14-year-old Research Fellow, V.A. Shiva Ayyadurai, working at the University of Medicine and Dentistry of New Jersey (UMDNJ), located in Newark, New Jersey, invented the first electronic system to replicate the interoffice, inter-organizational paper-based mail system consisting of Inbox, Outbox, Folders, Memo, Attachment, Address Book, etc. Ayyadurai named this system "email," a term he was the first to create, because he was inventing the "electronic" or "e" version of the interoffice, inter-organizational paper-based "mail" system. Moreover, the specific naming of email arose for idiosyncratic reasons since FORTRAN IV, the programming language used to create his invention, required all variable and program names to be in upper case and a maximum of six characters, while the Hewlett Packard RTE-IVB operating system, on which the software executed, had a five-character limit for program names. These constraints motivated the selection of "E," "M," "A," "I," and "L." Prior to 1978, neither the term "email," in any variation, upper case, lower case, mixed case, with or without the dash, nor did the software application "email" exist. After Ayyadurai's invention, the term "email" was misused, primarily by members of the ARPANET community and Raytheon/BBN, to refer to their developments in rudimentary methods for exchanging text messages, done *prior* to 1978, as "email." Such developments, while important in their own right, were not email, the system of interlocking parts intended to emulate the interoffice, inter-organizational paper-based mail system -- the email we all experience today.

Ayyadurai named the system "email" because he was inventing the "electronic" or "e" version of the interoffice "mail" system. Moreover, the specific naming of "email" arose from idiosyncratic reasons since the FORTRAN IV programming language, used to build the software, required all variable and program names to be in upper case and a maximum of six characters, while the Hewlett Packard RTE-IVB operating system, on which the software executed, had a five-character limit for program names. These constraints motivated the selection of "E," "M," "A," "I," and "L.

Chapter 3

V.A. Shiva Ayyadurai: The Inventor of Email

On August 30, 1982, the United States government awarded Ayyadurai the first U.S. Copyright for "Email," "Computer Program for Electronic Mail System" (Ayyadurai, 1982a), officially recognizing Ayyadurai as the inventor of email --- the system of interlocking parts designed to electronically emulate and expand the functionality of the interoffice, inter-organizational paper-based mail system.

CERTIFICATE OF COPYRIGHT REGISTRATION
FORM TX
 UNITED STATES COPYRIGHT OFFICE
 111-775

REGISTERED BY: Shiva Ayyadurai
 REGISTERED ON: 8/30/82

1 TITLE OF THIS WORK
EMAIL
Computer Program for Electronic Mail System

2 NAME OF AUTHOR
Shiva Ayyadurai
77 Bay State Rd., Boston, MA 02215

3 MAKE A WORK AVAILABLE TO THE PUBLIC
11/1/82

4 COPYRIGHT CLAIMANT'S NAME AND ADDRESS
Shiva Ayyadurai
77 Bay State Rd.
Boston, MA 02215

DECLARATION OF ORIGINALITY
 I, the undersigned, declare that I am the author of the work entitled "EMAIL" and that I am the owner of the copyright therein. I declare that the work is my original creation and that I have not previously published or registered it in any form. I declare that the work is a work of authorship and that it is a work of original authorship.

REGISTRATION NUMBER
353331-9218

Fig. 4. The U.S. Government Copyright Issuance for "Email" in 1982, Officially Recognizing Ayyadurai as the Inventor of Email. (Ayyadurai, 1982a).

At time of the invention of email in 1978, there existed no legal methods to protect software inventions. In fact, software patents were non-existent, and questionable at best, since the patentability of software itself was unclear and not recognized by the United States Supreme Court (Flewellen, 1980; Moran and James, 1980). However, in 1980, the United States Copyright Act of 1976 was amended to include software inventions. This resulted in the United States Computer Software Act of 1980 (Crews, 1987; Lemley, et. al., 2006).

In 1981, Ayyadurai, per the compliance requirements of the new Computer Software Act of 1980, applied for legal protection of his invention. In 1982, he

received such protection from the United States government, which formalized in government records his being the inventor of email. In addition to being awarded the Copyright for the software "Email," Ayyadurai was also awarded another Copyright for the software users manual, "*Email User's Manual*," "*Operating Manual for Electronic Mail System Program*" (Ayyadurai, 1982b). The user's manual provided the office workers at UMDNJ a detailed guide on how to use email.

Ayyadurai's distinction as the inventor of email, therefore, emerges from: 1) He being the first to conceive, design and invent the electronic version of the interoffice, inter-organizational paper-based mail system, containing all the features we experience today in every email program, which experts of the ARPANET community had deemed "impossible"; 2) His creating the term "email" in 1978 to name this invention; and, 3) His receiving formal legal protection and recognition by the United States government as the inventor of email.

The 14-year-old Indian immigrant's invention, moreover, was likely the world's first end user software application that made the computer accessible and meaningful to the lives of ordinary people. Ayyadurai's invention was revolutionary not only for the technological and design challenges that it overcame but also for the sociological and elitist barriers that it broke by enabling ordinary office workers, primarily woman, to move from the typewriter and paper to the terminal and keyboard, where email became their gateway to the brave new world of computing and digital communications.

What is even more compelling is the prescience of the young teenage inventor as to the relevance of his own invention, and its potential to humankind. In 1981, he submitted an essay on his invention for an awards entry to the Thomas Alva Edison/Max McGraw Foundation to be considered for a scholarship to support his attending university (Ayyadurai, 1981). The concluding paragraph in Ayyadurai's essay reveals that prescience:

"[Email]'s practical applications are unlimited. Not only is mail sent electronically, as many telexes and teletypes are capable of doing, 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. If electronic mail systems become a reality, they will surely create different patterns of communication, attitudes, and styles. Volumes of written work, for example, shall become obsolete." (Ayyadurai, 1981)

V.A. Shiva Ayyadurai in 1981, Livingston High School
Thomas Alva Edison/Max McGraw Awards Application

His invention did not go unnoticed and began to receive public recognition starting as early as 1980. On October 30, 1980, for example, a feature article, with the headline "Livingston Student Designs Electronic Mail System," appeared in the West Essex Tribune, which described his development efforts while a high

school student involved in a special independent study program setup by a pioneering Livingston High School educator, Ms. Stella Oleksiak (“Livingston Student”, 1980).

On January 21, 1981, the prestigious Westinghouse Science Talent Search Awards, today known as the Intel Science Talent Search Awards, honored his invention by awarding him the prestigious Westinghouse Science Talent Search Honors Group Award (Westinghouse, 1981).

On September 2, 1981, the Massachusetts Institute of Technology (MIT), the most eminent science and technology institute in the world, also found it important to mention and recognize the invention. On that day, Ayyadurai was attending MIT’s incoming freshman student orientation for the Class of 1985. The front page of the MIT Tech Talk, the official newspaper of the MIT faculty and administration, highlighted achievements of only 3 of the 1,041 students entering the MIT Class of 1985. Ayyadurai was one of them. The article shared his invention of email (Miller, 1981).