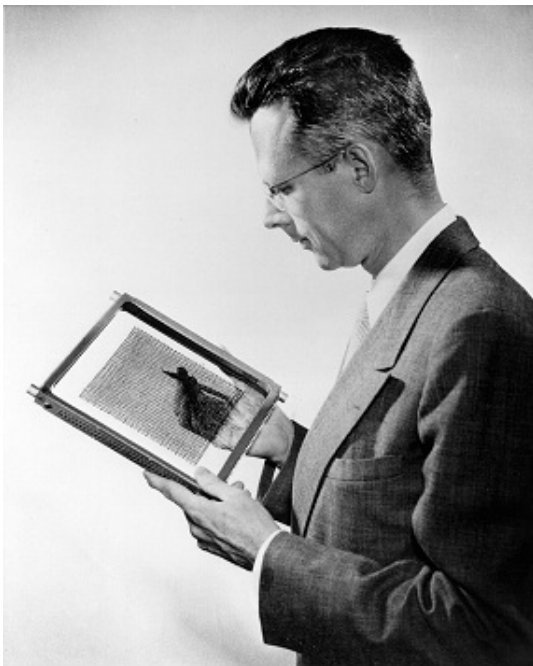


Jay Wright Forrester (born July 14, 1918) is a pioneer American computer engineer, systems scientist and was a professor at the MIT Sloan School of Management. Forrester is known as the founder of System Dynamics, which deals with the simulation of interactions between objects in dynamic systems.

Biography



Forrester was born in 1918 on a cattle ranch near Anselmo, Nebraska, in the middle of the United States. His early interest in electricity was spurred, perhaps, by the fact that the ranch had none. While in high school, he built a wind-driven 12-volt electrical system using old car parts—it gave the ranch its first electric power. [\[1 \]](#) After finishing high school, he had received a scholarship to go to the Agricultural College. Three weeks before enrolling, he realized a future of herding cattle in Nebraska winter blizzards had never appealed to him. So instead in 1936 he enrolled in the Engineering College at the University of Nebraska to study electrical engineering. As it turns out this study was about the only academic field with a solid, central core of theoretical dynamics. [\[2 \]](#)

After finishing the University in 1939 he went to the Massachusetts Institute of Technology, to become a research assistant and eventually spend his entire career. In his first year at MIT he was commandeered by [Gordon S. Brown](#) who was the pioneer in "[feedback control systems](#)" at MIT. During World War II his work with Gordon Brown was in developing [servomechanisms](#)

for the control of radar antennas and gun mounts. This work was research toward an extremely practical end that ran from mathematical theory to the operating field. Experimental units were

installed on the USS Lexington, and, when they stopped working, he volunteered to go to Pearl Harbor in 1942. He fixed the problem when the ship sailed off-shore during the invasion of Tarawa.

[\[](#)
[2](#)
[\]](#)

At the end of the war at MIT Forrester in 1944 started a project building of an aircraft flight simulator. The aircraft simulator was planned as an analog computer, but became the Whirlwind digital computer for experimental development of military combat information systems. This eventually became the SAGE (Semi-Automatic Ground Environment) air defense system for North America. [\[](#) [2](#) [\]](#) Around 1949, the Navy was losing interest in Whirlwind and considered scrapping it. But that August, the Soviet Union detonated its first atomic bomb. Relations between the U.S. and its former ally had so deteriorated that this event inspired worry and alarm throughout the government. People in the military realized that computers would be essential in the defense of the country now that the USSR had the capacity to attack from afar. Whirlwind, as the Navy's most advanced computer, suddenly looked good again. [\[](#) [1](#) [\]](#) Forrester continued his research in electrical and computer engineering until 1956. By then he felt the pioneering days in digital computers were over and he left engineering to go into management.

In 1956, Forrester moved to the MIT Sloan School of Management, where he is currently Germeshausen Professor Emeritus and Senior Lecturer. Application of his engineering view of electrical systems to the field of human systems would break new ground. Forrester focused on concrete experimental studies of organizational policy. He used computer simulations to analyze social systems and predict the implications of different models. This method came to be called "system dynamics," and Forrester came to be recognized as its creator. [\[](#) [1](#) [\]](#)

In 1982, he received the IEEE Computer Pioneer Award. [\[](#) [3](#) [\]](#) In 1989, he received the National Medal of Technology. [\[](#) [4](#) [\]](#) In 2006, he was inducted into the Operational Research Hall of Fame.

Work

Forrester is the founder of System Dynamics, which deals with the simulation of interactions between objects in dynamic systems. Jay Forrester is also known for his researches that led to the modern idea of supply chain management. During the late 1950s Forrester and his colleagues at the Massachusetts Institute of Technology developed many ideas and theories

that later became the cornerstones of supply chain management. ^[5]

See also

- Magnetic core memory
- [DYNAMO \(programming language\)](#)

Publications

Forrester has written several books, articles and papers. Books, a selection:

- 1961. *Industrial dynamics*. Waltham, MA: Pegasus Communications.
- 1968. *Principles of Systems*, 2nd ed. Pegasus Communications.
- 1969. *Urban Dynamics*. Pegasus Communications.
- 1971. *World Dynamics*. Wright-Allen Press.
- 1975. *Collected Papers of Jay W. Forrester*. Pegasus Communications.

Articles and papers, a selection:

- 1958. "Industrial Dynamics--A Major Breakthrough for Decision Makers.", in: *Harvard Business Review*, Vol. 36, No. 4, pp. 37–66.
- 1968, [Market Growth as Influenced by Capital Investment](#) . ^[6]
- 1971, [Counterintuitive Behavior of Social Systems](#) . ^[7]
- 1989, [System Dynamics and the Lessons of 35 Years](#) .
- 1991, [The Beginning of System Dynamics](#) . ^[8]
- 1992, [System Dynamics and Learner-Centered-Learning in Kindergarten through 12th Grade Education](#) . ^[9]
- 1994, [Learning through Systems Dynamics as preparation for the 21st Century](#) . ^[10]
- 1996, [System Dynamics and K–12 Teachers](#) . ^[11]
- 1998, [Designing the Future](#) . ^[12]
- 1999, [System Dynamics: the Foundation Under Systems Thinking](#) . ^[13]

References

1. [^] [a](#) [b](#) [c](#) [Biography Jay Forrester](#) . 2005,
2. [^] [a](#) [b](#) [c](#) J.W. Forrester, [The Beginning of System Dynamics](#) : paper for the Banquet Talk at the international meeting of the [System Dynamics Society](#)

, Stuttgart, Germany, July 13, 1989.

3. [^ "Computer Pioneer Award"](http://www.computer.org/portal/site/ieeecs/menuitem.c5efb9b8ade9096b8a9ca0108bcd45f3/index.jsp?&pName=ieeecs_level1&path=ieeecs/about/awards&file=CPAcharter_recipients.xml&xsl=generic.xsl) . http://www.computer.org/portal/site/ieeecs/menuitem.c5efb9b8ade9096b8a9ca0108bcd45f3/index.jsp?&pName=ieeecs_level1&path=ieeecs/about/awards&file=CPAcharter_recipients.xml&xsl=generic.xsl
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4. [^ Technology.gov](#)
5. [^](#) Blanchard, David. "Supply Chain Management Best Practices". John Wiley & Sons, Inc. 2010
6. [^](#) This article is from Industrial Management Review, Vol. IX, No. 2, Winter 1968. This classic system dynamics paper discusses why having enough capacity to meet demand is so important for a new company.
7. [^](#) HTML version.
8. [^](#) This provides a personal point of view about the development of system dynamics.
9. [^](#) This paper presents views on how system dynamics may improve classroom learning.
10. [^](#) This paper explains the advantages of a system dynamics education for the future.
11. [^](#) Writing on using system dynamics in kindergarten through twelfth grade education.
12. [^](#) English version of the paper Prof. Jay Forrester presented at the University of Seville on December 15th, 1998. This paper talks about how Dr. Forrester believes system dynamics will help in understanding the many complex systems in our society.
13. [^](#) In this paper Forrester explains his view that without including system dynamics concepts and principles, systems thinking runs the risk of being superficial and prone to assuming counterproductive conclusions.

External links

- [Oral history interview with Jay W. Forrester](#) , [Charles Babbage Institute](#) , University of Minnesota.
- [Selected papers by Forrester.](#)
- [Video lecture on Systems Dynamics by Forrester](#)