THE HISTORY, PRESENT AND FUTURE OF THE INTERNET OF THINGS (IOT)

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Introduction

An ecosystem of interconnected devices known as the Internet of Things (IOT) exchanges data across wired or wireless networks. These gadgets could be laptops, smart electric appliances, smart office equipment, cellphones, or anything else that has sensors. These devices provide data, which is subsequently transferred to servers, either on-site or in the cloud, where it is processed to produce insights that aid in decision-making. The IOT ecosystem can be developed across bigger areas, such as gated communities, university campuses, and cities, in addition to smaller spaces like our homes or offices.

We constantly use connected smart devices in our daily lives. It makes sense to comprehend the progress of IOT as a user or business owner offering IOT-related products and services.

IOT Evolution Milestones

Even if a child learns new things every day and continues to astound their parents, certain events do still mark significant turning points in their lives. Let's endeavor to document such turning points in the development of IOT:

The ancestor of the modern Internet was the first connected network, or ARPANET. ARPANET is where the IOT's history begins. David Nichols, a graduate student in the department of computer science at Carnegie Mellon University, inquired in 1982 about the availability of cold soda bottles in the department's Coke vending machine. Because the vending machine was far from his classrooms, he got bored of traveling there only to discover that there was no cold bottle available. Thus, he desired knowledge in advance.

He received assistance in this project from John Zsarnay, a research engineer at the institution, Mike Kazar, and Ivor Durham, two other students. If there was Coca-Cola in the vending machine, the code they built could determine if it was cold or not. The status of the Coke vending machine could be checked by anybody using the university's ARPANET.

The Internet was founded in 1989 when Tim Berners Lee suggested the world wide web's structure.

A toaster that could be started and stopped through the Internet was created in 1990 by John Romkey. Because Wi-Fi wasn't available back then, the toaster was tethered to the computer. The first "item" in the Internet of Things is thought to be this toaster.

Caffeine, whether hot or cold, seems to be a favorite among scientists and researchers. Quentin Stafford-Fraser and Paul Jardetzky constructed the Trojan Room Coffee Pot in the University of Cambridge's computer lab in 1993. Three times every minute, an image of the pot's interior was posted to the building's server. Later, when image display in browsers became commonplace, these images could be viewed online.

The term "internet of things" was first used in 1999 by Kevin Ashton, the current Executive Director of the Auto-ID Labs, marking the next major step in IOT. It was the name of a presentation he gave about connecting RFID in P&G's supply chain to the Internet at Procter and Gamble, where he was employed at the time.

By 2003–2004, established journals including The Guardian and Scientific American started using the term "Internet of

Things." The US Department of Defense and Walmart both implemented RFID during that time period.

The International Telecommunications Union of the United Nations recognized the significance of IOT in its report in 2005. It stated that IOT would contribute to the development of a completely new dynamic network of networks.
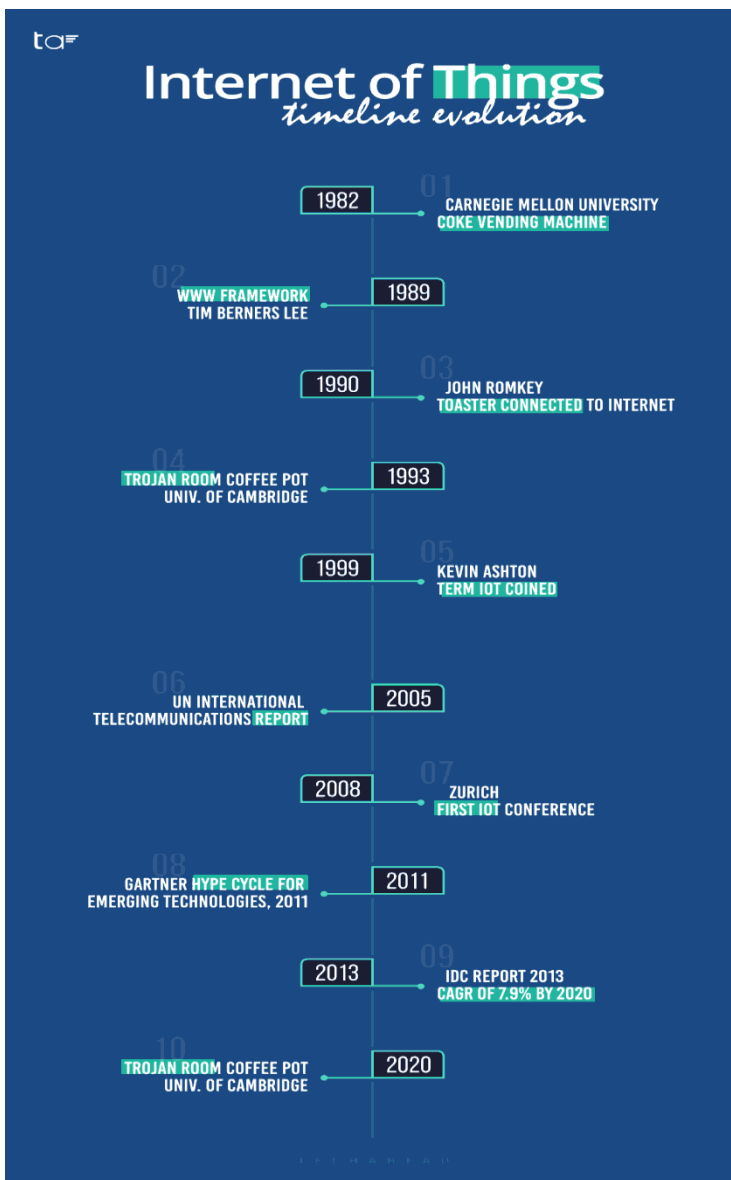
The inaugural IOT conference took place in Zurich in March 2008. To encourage information sharing, it gathered scholars and practitioners from both academia and industry. The Internet of Things was one of the six disruptive civil technologies identified by the US National Intelligence Council in the same year.

According to Cisco Internet Business Solutions Group (CIBSG2011)'s white paper, the internet of things was fully born between 2008 and 2009, when there were more things linked to the internet than people. According to CIBSG's calculations, the ratio of goods to persons increased from roughly 0.8 in 2003 to 1.84 in 2010.

Along with the white paper, Cisco also launched a number of instructional resources on the subject and launched marketing campaigns to draw in customers interested in adopting IOT. Soon after, IBM and Ericsson entered the competition.

IOT was featured in 2011's Hype cycle by Gartner, which tracked the development of emergent technologies.

Internet of Things *timeline evolution*

Year	Event
1982	01 CARNEGIE MELLON UNIVERSITY COKE VENDING MACHINE
1989	02 WWW FRAMEWORK TIM BERNERS LEE
1990	03 JOHN ROMKEY TOASTER CONNECTED TO INTERNET
1993	04 TROJAN ROOM COFFEE POT UNIV. OF CAMBRIDGE
1999	05 KEVIN ASHTON TERM IOT COINED
2005	06 UN INTERNATIONAL TELECOMMUNICATIONS REPORT
2008	07 ZURICH FIRST IOT CONFERENCE
2011	08 GARTNER HYPE CYCLE FOR EMERGING TECHNOLOGIES, 2011
2013	09 IDC REPORT 2013 CAGR OF 7.9% BY 2020
2020	10 TROJAN ROOM COFFEE POT UNIV. OF CAMBRIDGE

Architecture for IOT

Any IOT system, according to the definition of the term, consists of objects or devices that produce data, a network that transmits that data, and services that store and process it. These three layers can be considered to exist in an IOT system:

- Physical layer

Devices, sensors, and controllers make up the physical layer of the system. They are the fabric of the Internet of Things. Smartphones, tablets, computers, microchip-equipped items, and brownfield devices with RFID tags are some examples of devices.

- Edge computing layer

Edge computing is the practice of storing and processing data close to the devices where it is generated rather than on distant servers. The networks and communication protocols that will be used for connectivity and edge computing are specified by the edge computing layer. At the network's edge, IOT data processing begins.

- Application layer

The action shifts to cloud computing after the edge computing layer. The application layer is a collection of incorporated services the IOT cloud offers to help users make sense of the data they have collected.

IOT device data is cleaned before being saved on cloud servers where it is processed further to produce reports and insights. On top of the resources offered by cloud service providers, businesses can have their own unique apps developed.

Once an IOT ecosystem is established, additional devices are continuously added to it as needed. Rapid network scalability is necessary to accommodate the increase in linked devices. Different internet protocols are needed as various device types connect across various networks.

Economic Impact of IOT

By 2025, the economic value of IOT might range from USD 3.9 trillion to 11.2 trillion, according to McKinsey. Given the application of IoT in industries including manufacturing, healthcare, automotive, public safety, logistics, energy management, organizational redesign, etc., this forecast does not appear overly optimistic.

IOT is used by a wide range of enterprises and industries, and the COVID-19 pandemic has accelerated adoption because it offers the possibility for companies to adapt to the new normal.

Role of Tech Ahead in IOT Landscape

A team of IOT specialists at TechAhead has created a wide range of bespoke solutions, from connected healthcare apps to ambient environment and smart lighting. Our professionals offer a variety of services, including:

IoT consultancy

Our Internet of Things (IOT) professionals offer a variety of specialized consulting services, including device selection, architecture creation, maturity evaluation, and IOT road map planning. Our professionals have first-hand knowledge in full stack development.

Product design

Our specialists create cutting-edge IOT designs that are practical, dependable, durable scalable, secure, and economical. They create IOT devices that are completely optimized for Agile development, simple testing and problem-solving, and proactive maintenance.

Mobile app development

The most popular interface for controlling IOT devices is a mobile device. Our mobile app development team creates mobile IOT apps that are strong, engaging, simple to use, secure, and adaptive by utilizing solid mobile development frameworks.

Final Words

The Internet of Things (IOT) is a network of linked devices that share data. You may set up an IOT system in your house, company, university, or city. The first online network, ARPANET, marked the beginning of the Internet of Things. The first linked gadget was a Coca-Cola vending machine at Carnegie Mellon University that connected to the campus ARPANET in 1982.

The foundation of the world wide web, suggested by Tim Berners-Lee in 1989, cleared the path for the internet of things. In 1990, John Romkey established a connection between a toaster and the internet, enabling remote control of the device. In the computer lab of the University of Cambridge, the Trojan Room Coffee Pot was constructed in 1993. Online viewers could see pictures of the pot.

IOT was first used by Kevin Ashton, the current head of MIT's Auto-ID Labs, in 1999. It was a part of the common vocabulary by 2004. The inaugural IOT conference took place in Zurich in March 2008. It was one of the six disruptive civil technologies identified by the US National Intelligence Council in the same year.

IOT can be regarded to have begun in 2008 and 2009, when there were more things connected to the internet than people, according to a white paper published in 2011 by Cisco Internet Business Solutions Group. IOT was a part of the Gartner hype cycle for new technologies in 2011.

Three layers make up a modern IOT system: the physical layer, the edge computing layer, and the application layer. The physical layer gathers information. It is processed and made ready for transmission to the cloud servers by the edge computing layer. Applications in the application layer use the data to offer helpful insights. By 2025, the economic value of IOT is anticipated to reach USD 11.2 trillion, according to McKinsey.

Despite the fact that numerous firms and industries are adopting IOT, there are numerous obstacles to overcome. Any IOT system's primary engine is data. In order to prevent the business from becoming overrun with data, it is crucial to only collect the data that is necessary. In order to protect both users and IOT devices, the data must then be collected, stored, and transmitted securely.

Many governments have come to terms with the fact that IoT is quickly permeating every aspect of daily life for ordinary citizens. Security laws are being developed all around the world to guarantee data privacy and security.

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