

IMPROVING BUSINESS EFFICIENCY WITH IoT

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Introduction and Background

Artificial Intelligence helps to identify feasible entrepreneurial solutions. In this context, the Internet of Things (IoT), by collecting and using data, enables appropriate responses to the challenges facing entrepreneurs, increasing their efficiency and comfort. Using the IoT reduces costs and effort through automation, helps identify bottlenecks, monitor situations, and evaluate relevant results.

Methodology

To achieve the research objectives, a synthesis of several studies on the Internet of Things (IoT) was conducted. The analysis allowed for the formulation of conclusions and justifications. **Results:** The Internet of Things (IoT) is a network of electronic devices (also called "things") containing sensors, software, and other technologies that are connected to the internet to exchange data with other devices and systems, often without direct human intervention, automating tasks, collecting information, and optimizing processes in homes (smart homes), cities, healthcare, and industry, as well as interacting with other devices and people (also called "users") [1].

The concept of "things" encompasses a wide range of possible devices, such as smart home sensors and lighting, wearable medical devices, security system components, and components related to autonomous driving - all of which are connected to the internet. The vast majority of data exchanges between these devices occur through the transmission of data and the receipt of commands [2]. IoT is typically highly automated or augmented with intelligent software. This means that only a small amount of human-computer interaction is required, sometimes none at all.

The development of this technology stems from the need to automate logistics and delivery documentation, as well as to digitalize quality control, safety, and security of goods (especially food products and pharmaceuticals) (Figure 1).

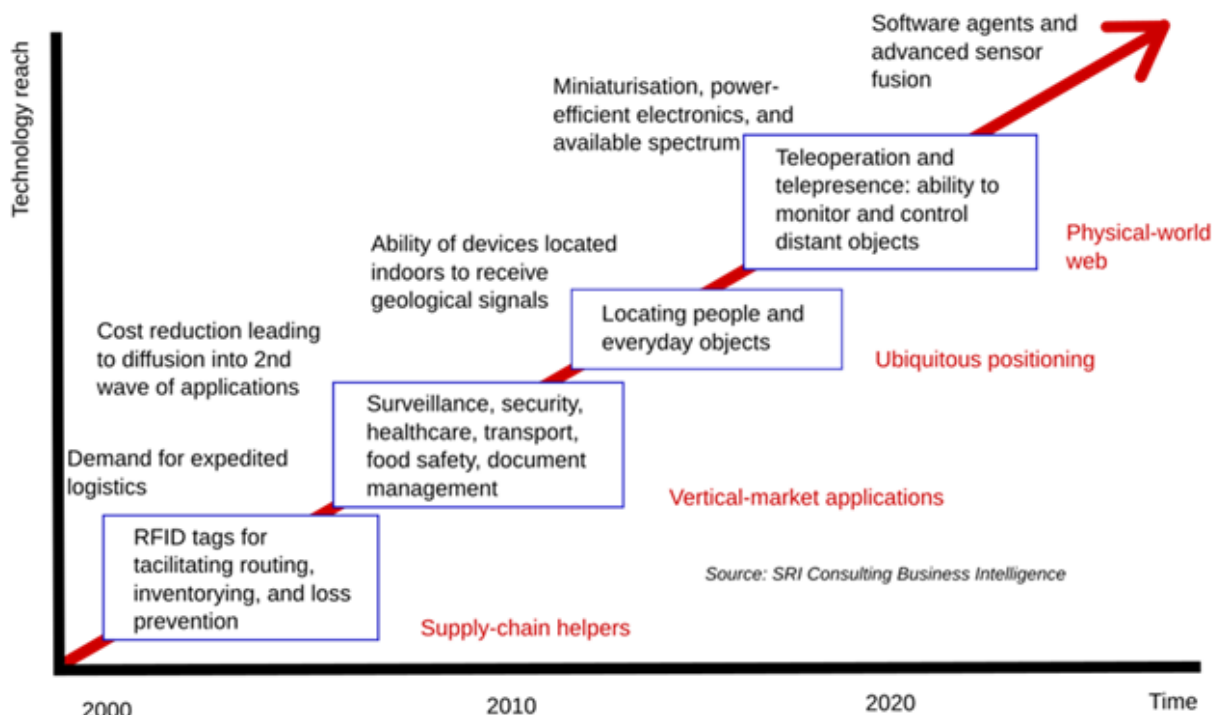


Figure 1. Technology roadmap: The Internet of Things

Source: [3, p. 1]

The core concept of the Internet of Things is to enable objects to observe the physical world and exchange information to support actions. As technology has advanced, responses to specific patterns have become automated, while the rules for triggering actions are set by humans. Consequently, "objects" can collect data (via sensors), send, receive, and act upon it. Communication between devices occurs automatically (M2M – machine-to-machine communication) [4] or with users, without the need for text input or direct commands.

IoT devices are used for a variety of purposes, such as:

- *In homes* – smart speakers, light bulbs, thermostats, refrigerators, and washing machines.
- *In communities* – smart meters, traffic management systems, and pollution monitoring.
- *In medicine* – smart watches and patient monitoring devices.
- *In industry* – manufacturing equipment and inventory management systems..

The Internet of Things (IoT) simplifies everyday tasks (e.g., cleaning, climate control), optimizes resource consumption (e.g., energy, water), and provides valuable data for rapid decision-making (e.g., predictive maintenance, traffic management).

Since the 1980s, the volume of data worldwide, as well as the computing technology required to store it, has grown exponentially. Advances in databases and analytical tools have made it possible to process and analyze in real time the vast volumes of data generated by IoT devices, intelligent vehicles, and equipment. This speed and throughput are crucial for the Internet of Things (IoT). Experts believe the IoT will drive a significant portion of global economic activity. The Internet of Things is a vector of digital transformation on the path to an economy characterized by increased efficiency, productivity, safety, and profitability.

Conclusions and Implications

The Internet of Things (IoT) can be successfully deployed on a large scale, bringing benefits such as cost reduction, time savings, and improved quality of life. The impact of IoT technology will grow over the next decade as manufacturing, agriculture, trade, transportation, finance, and other sectors transform their core processes and business models to harness the benefits of artificial intelligence.

Keywords: *Internet of Things, Artificial Intelligence*

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