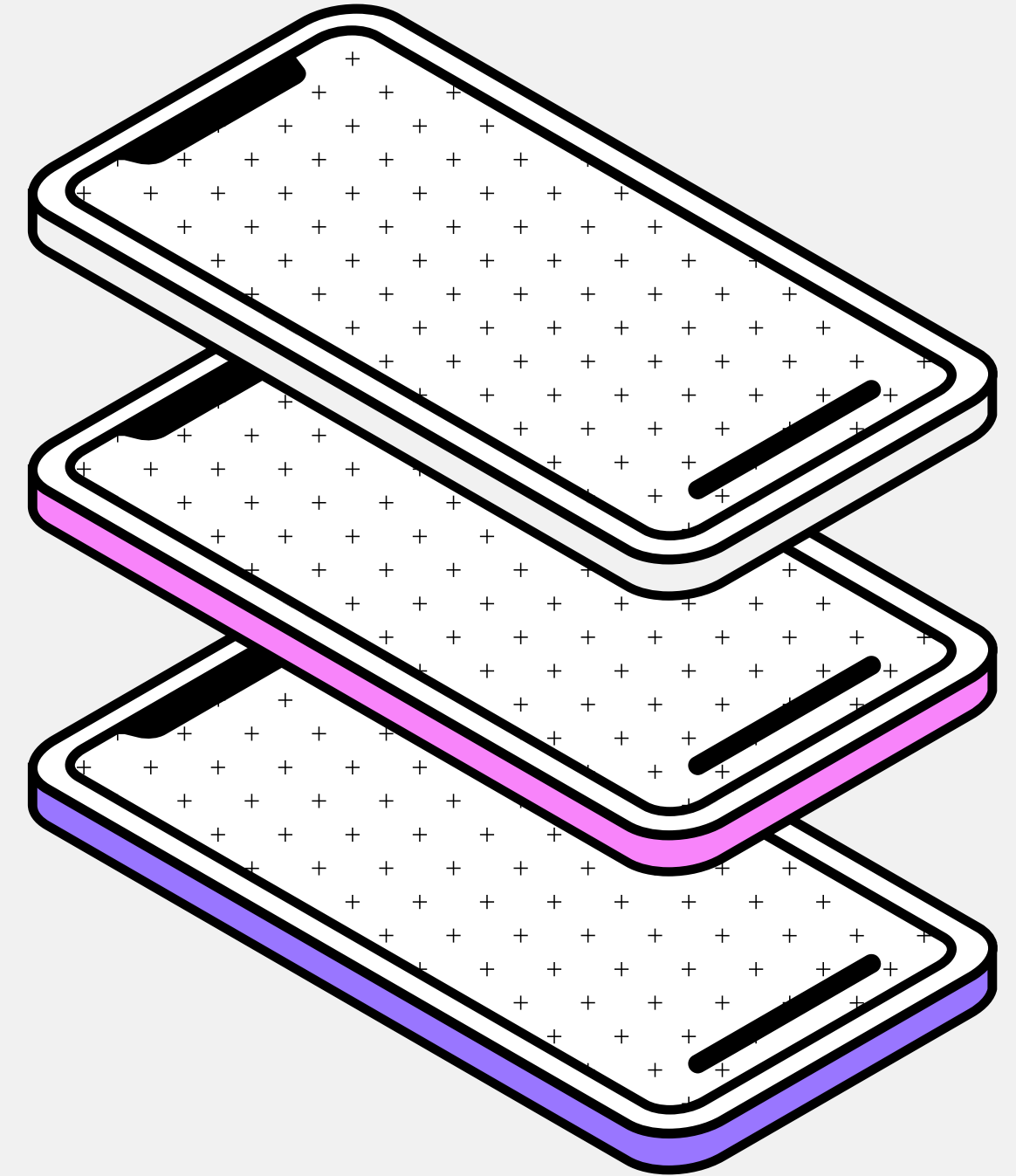


ICT

Information and Communication Technology

By: Alexandre Café



ICT, what is it?

Refers to the diverse range of technologies used to manage, process, transmit, and share information electronically.

Its significance can be summarized in some several key points:

- Facilitating Communication
- Empowering Businesses
- Enabling Access to Information
- Enabling the development of new technologies
- Bridging the Digital Divide



Key Components of ICT

Hardware

Hardware constitutes the physical components of information and communications technology, like computers, servers, networking devices, and storage devices

Software

Comprises the programs, applications, and systems that enable users to perform various tasks on ICT devices, There can be: operating Systems (windows, macos), Productivity Suites (Microsoft Office), and Specialized Software (AutoCAD)

Networks

Is a group of two or more computers or other electronic devices that are interconnected for the purpose of exchanging data and sharing resources

Data

Means any information stored and processed within the ICT system and includes programs, text, pictures, sound, video and any form

Sectors and Areas of ICT

There are many different sectors in the ICT industry, and some these areas include:

Computer programming

Cloud platforms

Software engineering

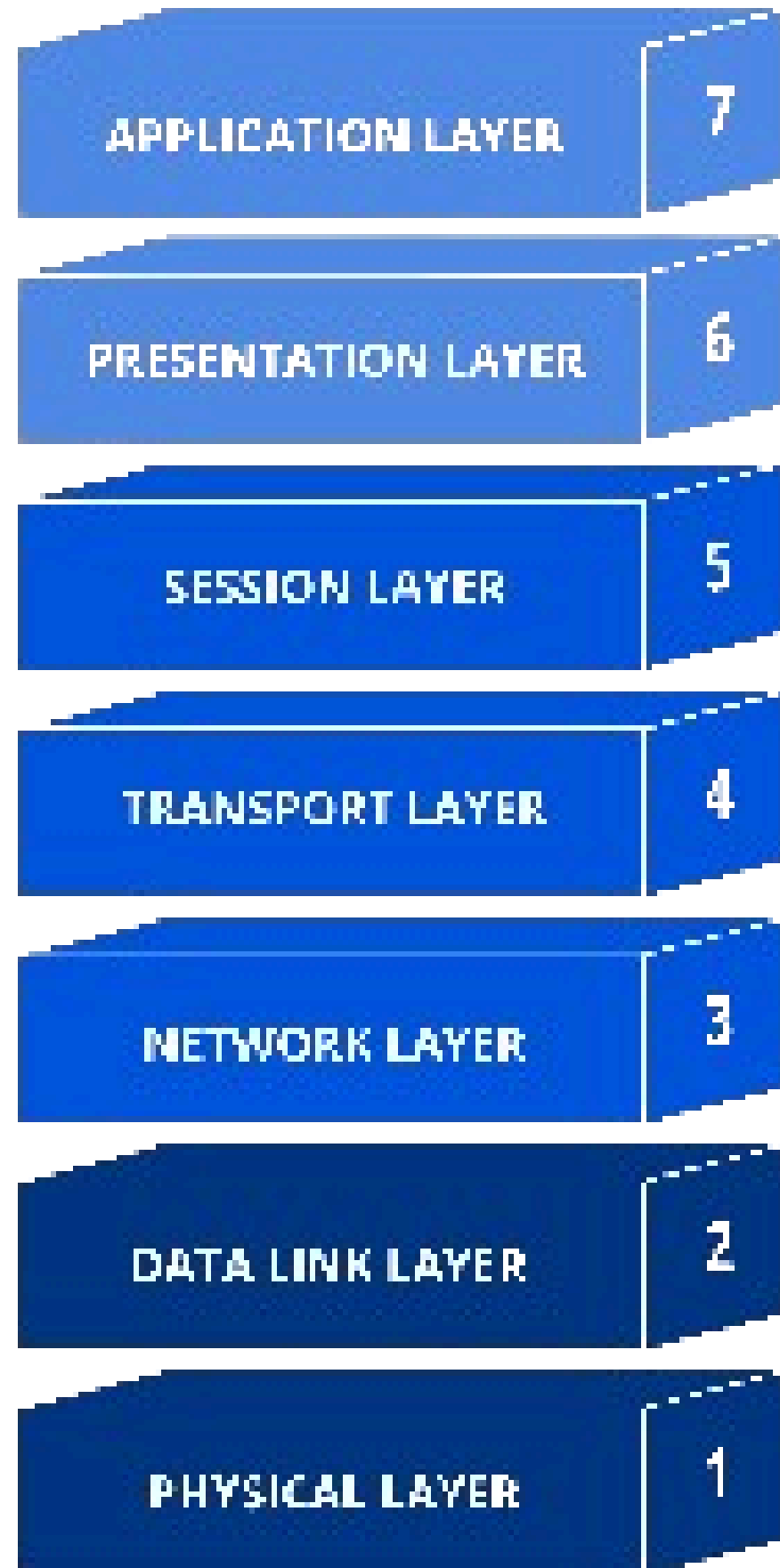
Cybersecurity

Systems analysis and design

Networks and database administration



Basic of Networks



The application layer provides network services directly to end-users and applications.

Is responsible for data formatting, translation, encryption, and compression

Establishes, maintains, and terminates communication sessions between applications

Is responsible for end-to-end communication and reliability between sender and receiver

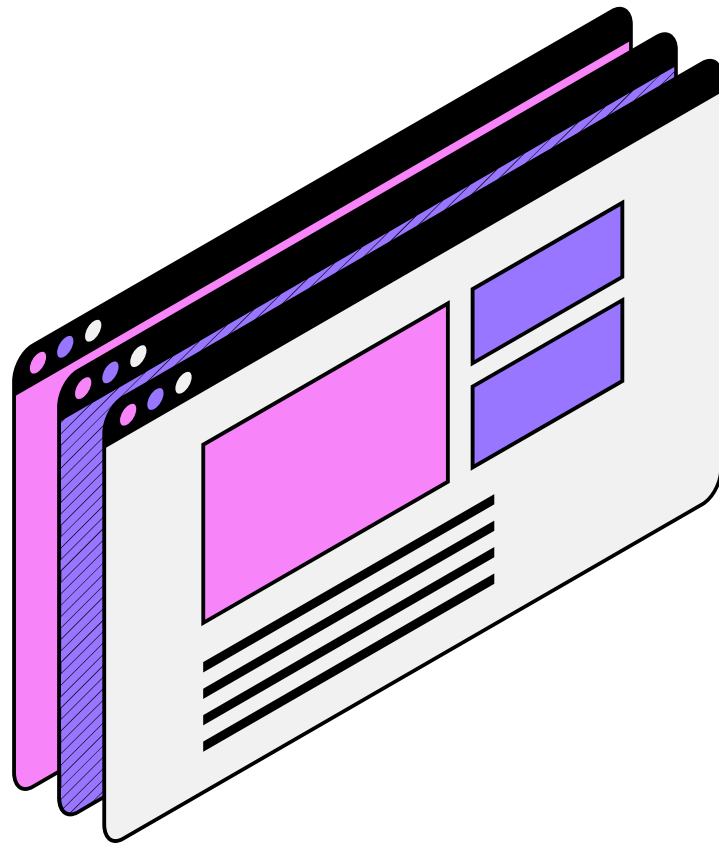
Is responsible for routing data packets between different networks and subnets

Is responsible for establishing and maintaining direct links between adjacent nodes in a network

Is responsible for transmitting raw data bits over a communication channel

Cybersecurity

Cybersecurity refers to protecting systems, networks, programs, devices, and data from cyber-attacks using technologies, processes, and controls, and Common Threats in Cybersecurity are:



Malware

Phishing

Denial of Service (DoS) Attacks

Advanced Persistent Threats (APTs)

Insider Threats

Man-in-the-Middle (MitM) Attacks

Basic Concepts in Cybersecurity

Confidentiality

Confidentiality ensures that sensitive information is accessible only to authorized individuals

Integrity

Integrity ensures that data remains accurate, complete, and unaltered during storage, transmission, or processing

Authorization

Authorization determines the permissions and privileges granted to authenticated users or entities based on their roles, responsibilities, or access rights

Authentication

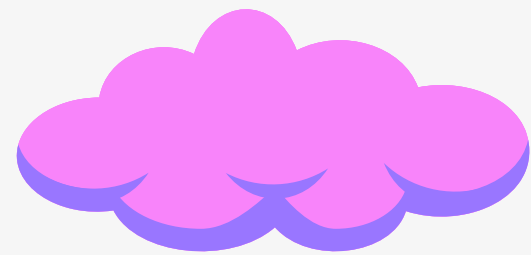
Authentication verifies the identity of users or entities attempting to access systems, services, or data

Availability

Availability ensures that systems, services, and data are accessible and operational when needed by authorized users

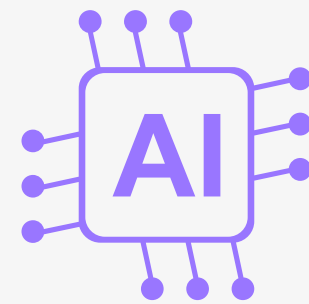
ICT Technologies

Some others ICT technologies are:



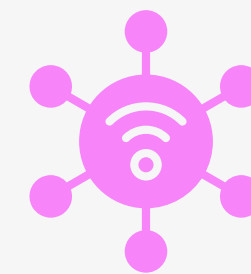
Cloud Computing

Refers to the delivery of computing services over the internet, allowing users to access resources without the need for local infrastructure or management



Artificial Intelligence (AI)

Refers to the network of interconnected devices, sensors, and objects that collect, exchange, and analyze data to enable intelligent decision-making and automation



Internet of Things (IoT)

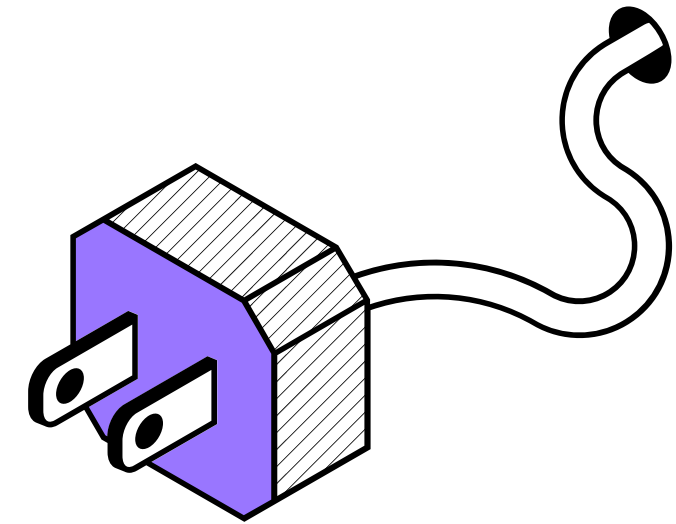
Enable computers to perform tasks that typically require human intelligence, such as pattern recognition, decision-making, and natural language processing

Industry 4.0

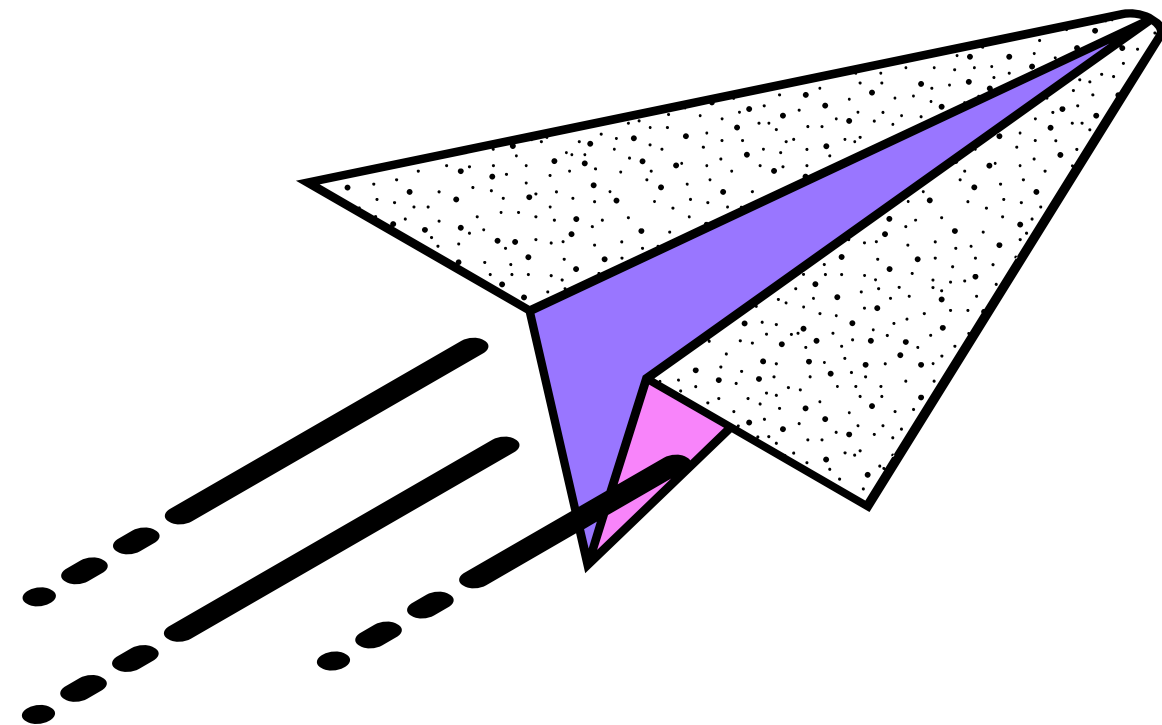
Understanding network speeds

Industry 4.0 is the name given to the fourth industrial revolution characterized by the inclusion of advanced technologies in production processes. These technologies include automation, robotics, the internet of things and artificial intelligence.

Some of the key Industry 4.0 technologies that companies are beginning to integrate into both their facilities and processes include the [internet of things \(IoT\)](#), [cloud services](#), [Big Data analytics](#), [artificial intelligence \(AI\)](#) and [machine learning](#), as well as [advanced robotics](#).



Benefits of Industry 4.0



Improved Quality

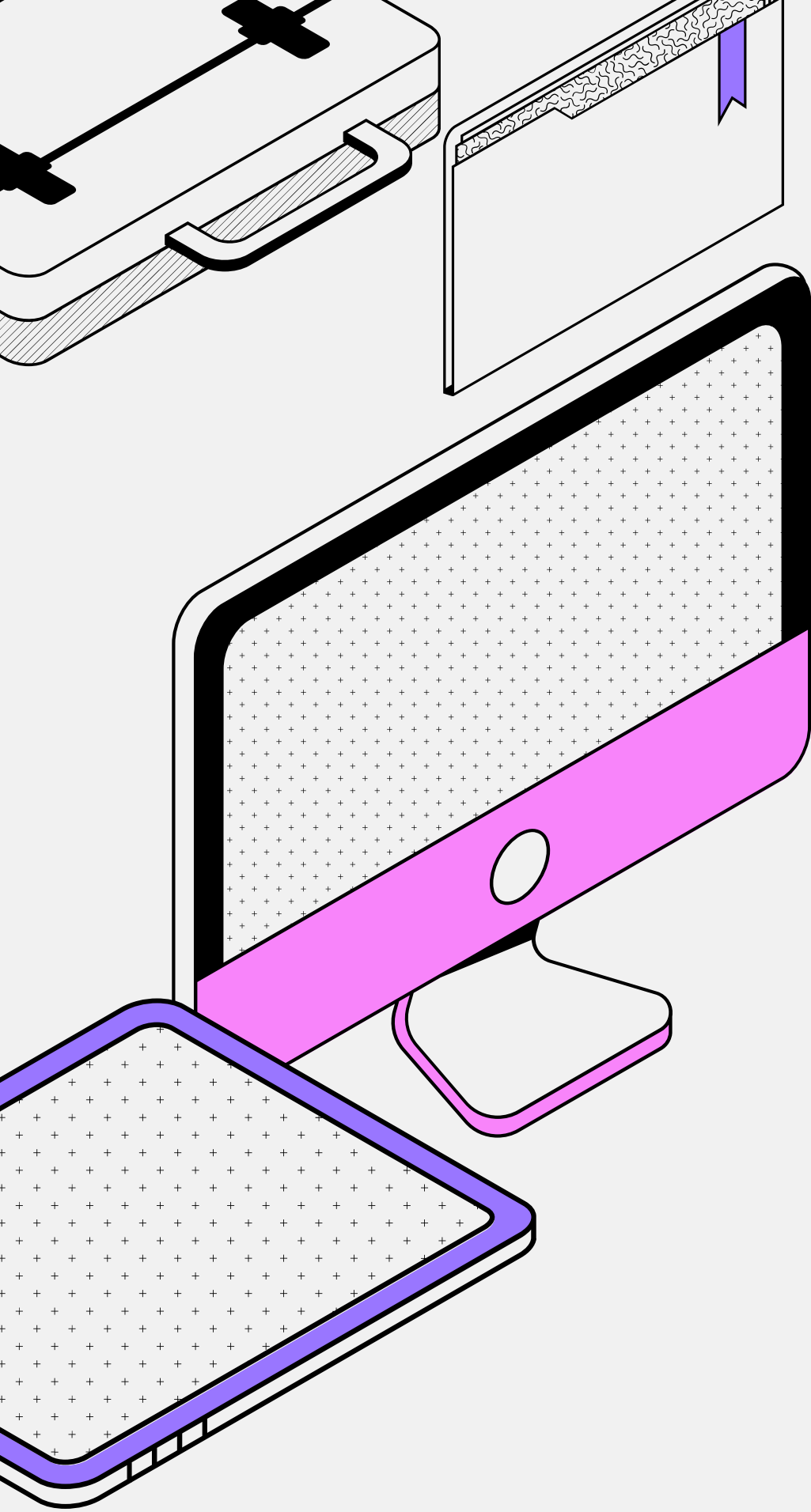
Data-driven insights, predictive analytics, and continuous monitoring enhance product quality, and ensure compliance with regulatory standards

Enhanced Flexibility

Digital technologies enable agile manufacturing, rapid reconfiguration, and customization of products to meet changing market demands and customer preferences

Cost Reduction

Optimization of resources, predictive maintenance, and inventory management strategies lower production costs, improve resource utilization, and increase profitability



Thank You

