The 22nd International Conference on
Technical and Physical Problems of Engineering
ICTPE-2026
31 October 2026
International Organization of IOTPE

INFORMATION TECHNOLOGY: CONCEPT, TYPES AND FUNCTIONS

J.A. Guliyev, O.A. Aliyev, R.B. Rustamov

Institute of Physics, Ministry of Science and Education, Baku, Azerbaijan
Azerbaijan State Oil and Industry University, Azerbaijan
EILINK Research and Development Center, Khazar University, Baku, Azerbaijan

The concept of information technology Clarified and its structural components:

- identified,
- comprising hardware,
- software,
- data,
- communication channels
- organisational procedures and
- personnel

The aim of the present paper:

- to provide a systematic overview of information technology as an object of study. Accordingly, it pursues three objectives:
- to clarify the concept of information technology and
- describe its structural components;
- to classify the principal types of information technology,
- have emerged in the last two decades; and
- to analyse the functions that information technology performs in
- scientific,
- economic, and
- social systems.

This definition contains three elements that deserve emphasis.

- First, information technology is a process, not merely a collection of devices; the equipment is a carrier of the technology rather than the technology itself.
- Second, its purpose is the production of an information product possessing a new quality, that is, information that reduces uncertainty for the person or system that receives it.
- Third, information technology is inherently instrumental: it is defined with reference to the task it serves, and the same technical means may implement quite different technologies depending on the objective.

- The present paper:
- a narrative,
- conceptual review rather than a systematic one:
- its purpose:

✓to synthesise an analytical framework for information technology as a field of study, not to catalogue exhaustively the literature of any one of its subfields, several of which already possess their own systematic reviews.

The classification developed the functional analysis developed in Section 3 draw on two kinds of source:

- foundational textbooks that define each technological class at the level of principle, and,
- for the classes that consolidated within the last two decades –
- cloud computing,
- big data, artificial intelligence, and
- the Internet of Things

Information technology may be classified on a number of grounds:

- by the type of task solved,
- by the degree of automation,
- by the class of user,
- by the architecture of the system and by the technical basis employed.

The classification adopted below is based on the technological basis and the character of the information processes involved, since this criterion is the most stable and the most widely used in the literature.

- The classes described are not mutually exclusive; a real information system normally combines several of them.

Relational systems, based on a formal model of data as sets of tuples and manipulated by a declarative query

- language,
- remain dominant in applications requiring strict consistency,
- whereas
- non-relational systems,
- offering flexible schemas and
- horizontal scalability, are preferred where the volume and heterogeneity of data are more critical than transactional strictness

They are used in:

- cartography,
- land management,
- environmental monitoring,
- urban planning,
- transport logistics and
- the interpretation of remotely sensed data, and
- they represent one of the clearest examples of an information technology that creates analytical possibilities that did not exist before its introduction, rather than merely accelerating existing procedures

Internet Technologies

- Internet technologies facilitate work on the Internet.
- They include software and hardware tools such as:

➢web browsers,

➢electronic mail,

➢search engines,

➢social media, and

➢online shops.

Artificial Intelligence Technologies

- Artificial intelligence technologies comprise methods that enable computing systems to perform tasks normally requiring human intellectual capabilities:

✓recognition,

✓classification,

✓forecasting,

✓planning,

✓reasoning under uncertainty and

✓the generation of content.

Management, Analysis and Decision Support

- The management function comprises the use of information technology to:

➢plan, organise,

➢coordinate and

➢control the activity of an organisation or a technical system.

It relies on the preceding functions and constitutes their practical justification: data are:

✓collected,

✓stored,

✓processed and

✓presented in order that decisions may be taken on a better-founded basis than would otherwise be possible

Conclusion

The principal types of information technology, distinguished by:

- technological basis,
- comprise computer,
- network,
- telecommunication,
- Internet, multimedia and
- mobile technologies,
- information systems and
- the more recently formed classes of cloud,
- big data,
- artificial intelligence and
- Internet of Things technologies.

These classes are not mutually exclusive:

- a real information system normally combines several of them, and
- the direction of development lies in their further convergence