

THE BRITISH COMPUTER SOCIETY

A Glossary of
**COMPUTING
TERMS**

TENTH EDITION

计算机术语汇编 第10版

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A Glossary of COMPUTING TERMS

Tenth Edition

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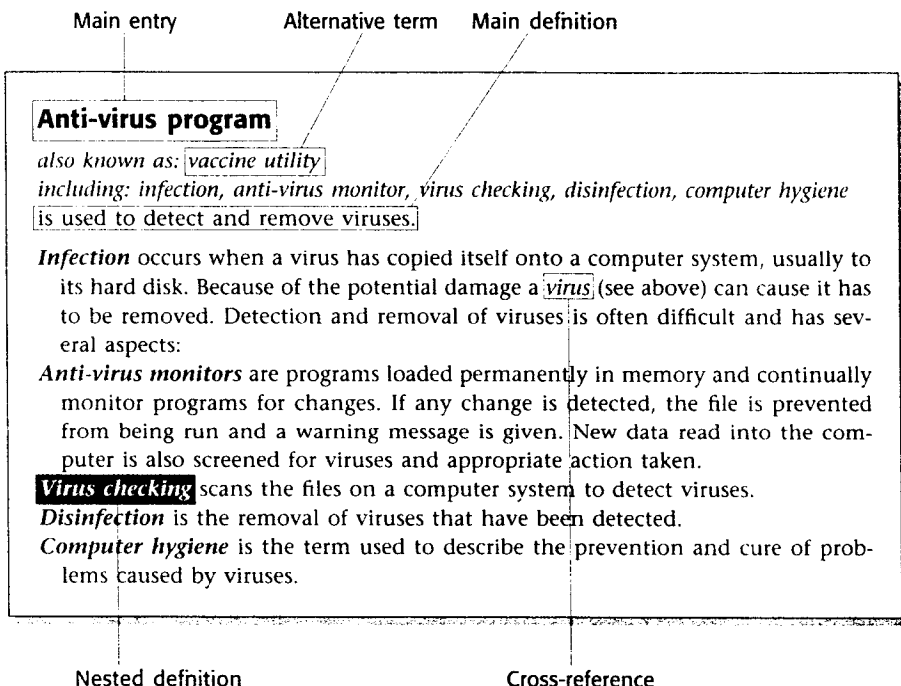
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How to use this Glossary

A glossary is not a dictionary. The only place you will find a full alphabetical list of all the term covered is in the Index at the back of the book.

For example, looking up 'virus checking' in the Index leads you to page 119. You will need to scan the page for '**Virus checking**' in bold text. You will find it as part of the definition of 'Anti-virus program' which is reproduced below.



An alternative way of finding the appropriate entry is to examine the lines in *italics* immediately after the main entry. These provide a list of terms covered in that definition.

Each section begins with some background information (see, for example, pages 109–110) and you may like to read this as well.

There are, of course, other ways of using this Glossary. Related terms occur together, and you may find it helpful to read through a complete section or subsection.

TIM REEVE

This Glossary is dedicated to the memory of Tim Reeve. He was a founder member of the Glossary Working Party in 1974. In 1991 he became its Chair and at his untimely death in October 2000 he was working on the final draft of this edition.

Introduction

The *Glossary* contains comprehensive explanations of over 3000 terms, covering the whole of basic Computer Science and IT. Although many groups of definitions have been expanded to provide more than just a bare definition, in the hope of creating a wider and clearer understanding of the term, these expanded definitions cannot cover all the aspects appropriate to any topic. It must be stressed that it is not intended that the *Glossary* should be used as a textbook.

The *Glossary* is not merely a list of terms in alphabetical order. Terms are arranged in four distinct thematic parts, each divided into sections containing groupings of associated terms and headed with background information. It is hoped that readers will take advantage of this structure to browse within sections making use of the general introductions to each. The introductions provide additional information that put the terms into context.

The *Glossary* has, as one of its principal aims, the needs of students following courses leading to examinations at school and college level. It is often a definitive reference source, specified in examination board syllabuses. The content has increasingly found wide acceptance in universities and colleges as well as in support of induction sessions and training courses within government departments and industry generally. Recently, it has been bought by home-based computer users.

With the further development of the National Curriculum, the expansion of GCSE and the review both of A Level and AS level syllabuses (as well as other courses at a variety of levels) the Working Party has tried to ensure that the *Glossary* keeps pace with the needs of students.

The Working Party is conscious of the need to provide definitions which cover the use of terms in the context of large computer systems as well as the world of microcomputers. Although for many school and college students large computer systems may be outside their practical experience, they are likely to encounter consequences of the use of such machines in their future in the outside world.

Decisions about which terms to rewrite, include or delete must again trust their justification to time. Some terms have been considered but not included since it was judged either that their use in schools and colleges was not yet apparent, or that the terms themselves lacked consistency in use.

The origins of the *Glossary* – over 25 years ago – have been instrumental in determining its development from a tiny listing to the 3000 terms in the publication today. In 1974, a conference of the Regional Examining Boards for the Certificate of Secondary Education invited the British Computer Society to produce a standardised list of terms for use in computer studies courses and examination syllabuses. The Society's Schools Committee set up a Working Party with a remit to produce what was thought to be a 'once-off' document containing about 100 terms. At the time, there was only one A-level computing examination and a small number of examinations for 16-year-olds. Those schools involved in computer

studies relied on batch processing using punched cards to be sent off to university computing centres or, for a few fortunates, an on-line terminal connecting them to the local authority computer. Microcomputers were just beginning to appear but were rare in schools.

This list of terms had a very limited distribution, being available only to the examiners of those Regional Examining Boards. Teachers, preparing pupils for these examinations, protested that this was unfair since it was impractical to try to prepare pupils to deal with terms which were known only to those examiners with access to copies of the list.

At the end of 1974, work therefore began on the first 'public' edition of the *Glossary*. It was decided to include a simple and concise definition of each of the terms which were unique to computing and to indicate which were preferred terms – at a time when almost all sources of computing expertise were inventing their own vocabulary. When this first real edition appeared in 1977, it contained some 430 terms of which 260 were defined. Given that the target audience was the 14–16 year-old pupil, it was decided that, as far as possible without compromising technical accuracy, basic English should be used in the explanation of the term – an objective still retained wherever possible.

The popularity of the 1st Edition was such that, following several reprints, further editions were demanded. They included those new terms which, appearing almost daily, were required to keep pace both with the rapid development of the technology and with the increasing use of computers in education. It is the policy to update the *Glossary* every three years or so.

The Working Party has appreciated the help it received from those members of the BCS Schools Committee who made comments and suggestions about material to include in this edition. The Working Party also welcomes offers from teachers willing to involve their students in a review of this edition and would like to express its thanks to all who have commented, criticised, and made helpful suggestions on the 9th Edition. Where possible, these have been taken into account in preparing this 10th Edition.

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Part A

HOW COMPUTER SYSTEMS ARE USED

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This section contains terms which may be met by any computer user working with applications in any of the areas covered. Some sections in Part A are concerned with general issues and others with well-defined areas of computer use. Some sections contain terms which might have been placed in Part B or even in Part C or Part D, but they were kept with other related terms for completeness; this is particularly true of the sections covering the Internet, sound and user interfaces, which have become more prominent aspects of computer use since the previous edition was published. Some terms have references to terms in Part B, Part C or Part D which will provide readers with pointers to other associated terms and concepts.

A1

General Computing Terms

When approaching computing for the first time we meet a range of terms which people involved in the industry take for granted. These terms are often vague generalisations and may mean different things to different people. They are also applied to a wide range of situations within computing and their precise meaning may vary between contexts.

Most jargon we meet when using a computer is related to the task we are doing. The software used to perform the task is called the application. Examples of these applications include word processing, computer art and using a database. However, there is some jargon that relates to running the computer itself, that is, how we control or operate a computer.

This section provides general definitions of some of the more common computing terms that are either used in a general context or apply across many areas of computing.

Information Processing

Information processing

is the organisation, manipulation and distribution of information. As these activities are central to almost every use of computers, the term is in common use to mean almost the same as 'computing'.

Information Technology (IT)

including: ICT (Information and Communication Technology)

is the application of appropriate (enabling) technologies to information processing. The current interest centres on computing, telecommunications and digital electronics. In the UK schools sector the preferred term is *ICT (Information and Communication Technology)*.

Telecommunications

is a general term describing the communication of information over a distance. The method of communication is normally via a cable, *wire* or *fibre optic* (see page 166) or electromagnetic radiation. See also *wireless communication*, page 165.

Computer

is a machine that processes data. It takes data, in digital form, which is processed automatically before being output in some way. It is programmable so that the rules used to process the data can be changed. It is an automatic, programmable,

digital data processor. These ideas are expanded in the introduction to section B1, page 124. The definition excludes the *analog computer* (page 125).

Computer system

including: configuration

is the complete collection of components (hardware, software, peripherals, power supplies, communications links) making up a single computer installation. The particular choice of components is known as the *configuration* – different systems may have the same configuration or not.

Embedded system

is the use of a computer system built into a machine of some sort, usually to provide a means of control. The computer system is generally small, often a single microprocessor with very limited functions. The user does not realise that instructions are being carried out by a computer but simply that there are controls to operate the machine. Examples are electronic washing machines, video recorders, burglar alarms and car engine management systems.

Hardware

is the physical part of a computer system – the processor(s), storage, input and output peripherals, etc. This is in contrast to the *software* (see page 4) which includes application packages, and the data in the storage.

Peripheral

also known as: device

including: input device, output device, Input/Output device (I/O device), storage device

is a piece of equipment (or hardware) which can be connected to the central processing unit. They are used to provide input, output and backing storage for the computer system. No particular peripheral is required by a computer but every computer must have some method of input and output (for example, a washing machine may simply have push buttons for input and *actuators*, see page 57, for output). They are often referred to as follows:

Input device is a peripheral unit that can accept data, presented in the appropriate machine-readable form, decode it and transmit it as electrical pulses to the central processing unit.

Output device is a peripheral unit that translates signals from the computer into a human-readable form or into a form suitable for re-processing by the computer at a later stage.

Input/Output device (I/O device) is a peripheral unit that can be used both as an input device and as an output device. In some instances, 'input/output device' may be two separate devices housed in the same cabinet.

Storage device is a peripheral unit that allows the user to store data in an electronic form for a longer period of time and when the computer is switched off. The data can only be read by the computer and is not in human-readable form.

Media

Is the collective name for materials (tape, disk, paper, cards, etc.) used to hold data.

Software

including: applications program, applications package, generic software, productivity tool, content free software, framework program

consists of programs, routines and procedures (together with their associated documentation) which can be run on a computer system.

An **applications program** is a computer information system designed to carry out a task (such as keeping accounts, editing text) which would need to be carried out even if computers did not exist.

An **applications package** is a complete set of applications programs together with the associated documentation (see *user documentation*, page 103). Where the application is appropriate to many areas, it is usual to describe it as **generic software** or as a **productivity tool**. For example, *word processing* (see page 15) can be used in personal correspondence, the production of business 'form letters', academic research, compilation of glossaries, writing books, etc.

Content free software, or **framework program**, can be adapted by a user for a range of unrelated tasks. For example, a program to provide help facilities may also be used to provide an index or may be used independently to provide a simple electronic book. The software does not start with any data, but is a tool to present data to the user's requirements.

See also *systems software*, page 274.

Integrated package

also known as: integrated program

is a single piece of software that provides a user with basic information processing functions. It usually provides for word processing, spreadsheets and small databases and may include additional facilities such as charts, a diary and communications. It is designed so that data can be easily moved between the various parts enabling complex tasks to be performed easily.

Tutorial

is a program that helps a user to learn about a new application. The tutorial will include a simple explanation of how to use the new system, diagrams and possibly examples the user can try whilst the tutorial program monitors the user's progress.

Files

File

File including: filename, datafile, file name extension

is a collection of related data stored within a computer system (see *backing store*, page 136). How and where the data is stored will be organised by the *operating system*, see page 275.

A **filename** is used to define this collection of data. This data may be handled as a single unit, for example it may be opened, copied or deleted as a single operation.

The data may represent many different types of information such as text, pictures, programs and the highly structured files used in database systems. The term **datafile** is often used for a collection of identically structured *records*, with each record made up of *fields* (see pages 254, 255).

To be accessed, a file has to have a name that is recognised by the system. The operating system determines the conventions for file names. All filenames systems have the requirement to add characters at the end, the **file name extension**, which may or may not be user controlled. The filename extension identifies the kind of data in the file, for example graphic data, word-processed document. See also *file type*, below.

File type

including: *CSV file (Comma Separated Variable files)*, *TSV file (Tab Separated Variable files)*, *SID file (Standard Interchangeable Data files)*, *RTF file (Revisable Text Format files or Rich Text Format files)*, *ASCII file, text file*

is the labelling of a file to identify the structure of its contents. This means that the user knows which software can be used with that data and that an applications program knows how to load and interpret the data. In some cases the operating system uses the file type to locate, load and run the application software as well. The file type may be implicit or explicit, where the three characters of the *file name extension* (see above) indicate the file type.

Most application programs have their own file types for data stored in their format. Other file types are used to transfer data between applications. Some common file types are detailed below:

CSV files (Comma Separated Variable files) are used to transfer tabular data between applications. Each *field* is separated by a comma and may be enclosed in quotation marks to avoid ambiguity. See page 255.

TSV files (Tab Separated Variable files) are also used to transfer tabular data between applications. Each *field* is separated by a special character (the tab character) to avoid ambiguity. See page 255.

SID files (Standard Interchangeable Data files) are also used to transfer tabular data between applications. The format also allows other data to be stored. SID files are not common outside the UK education market.

RTF files (Revisable Text Format files or Rich Text Format files) are in a complex format used to store data from a word processor, including information about fonts, sizes, colour and styles. This standard format can be used to transfer data between most word processor packages without losing the formatting information.

ASCII files or Text files are used to transfer textual data between programs. The data consists only of individual characters in the standard ASCII code. No formatting information is included and, as a result, ASCII data is a file type acceptable to most programs. This is the most common means of transferring data between application packages. Most packages that allow data to be *imported* (see *import*, page 16) will accept a text file.

File Filter

also known as: file loader, file converter, format translator

is software that converts data from one format to another. This allows an application to use data prepared using a different software application. Usually the filter works transparently, without user intervention, as the file is loaded into the application. See also *user transparent*, page 101.

File filters often exist to allow a file to be saved in a format suitable for use in a different application. See also *file*, page 4.

Graphics filter

is a special form of *file filter* (see above) which allows the loading, and sometimes saving, of graphical image files. There are many different formats for graphical image files and appropriate filters are very important in enabling images to be transferred between applications. See also *GIF*, page 49, and *JPEG*, page 86.

Operation

Customise

is tailoring a computer system to the requirements of a specific user. This may involve adding extra fields to a database, adding extra functions to a program, altering the keys used to suit a particular user or adding a peripheral such as a bar code reader. Individual users may customise their systems by selecting which options to install or by adding *macros* and *plugin* components (see page 216).

Default

including: default option, default value

is an assumption made by computer software in the absence of explicit instructions to the contrary. This may be a **default option** – your files are listed in alphabetical order, unless you request date or size order – or a **default value** – the computer prints one copy of a document, unless you request multiple copies. The best software is designed so that the most frequently used options are all available as defaults, so that users are not troubled by the need to continually specify such values. It is often possible for users to customise software, by selecting their own choice of defaults.

Object Linking and Embedding (OLE)

including: embedded object, linked object

is the insertion of data items in one format into data in another format, for example a picture in a text file. Information such as the location of the data and its format may be included as links to the data, or the data may be embedded in the file. A program using the data can load the right program to edit that particular type of data without the user having to *export* the data, edit it and later *import* it back again (see page 16). Each item is an *object* (see page 195).

Embedded objects are inserted as part of the data and saved with it.

Linked objects are stored separately and only loaded when they are needed; the location (usually a filename) is stored in the main data. Changes made to the linked object automatically apply to the main data.

Operational mode

including: batch processing, transaction processing, multi-access, time-sharing, real-time system, interactive processing, remote access, tele-processing, off-line processing, on-line processing

is the way a computer system is used and operated. Decisions about operational modes are made during systems design. Often the *operating system* (see page 275) manages the functioning of the operational modes in use.

The terms in this section are not necessarily mutually exclusive, and more than one might be applicable to any particular computer system.

In **batch processing** all the data to be input is collected together before being processed as a single efficient operation. This method is also used when computer users submit individual *jobs* (see page 281) which are processed together as a batch.

Transaction processing deals with each set of data from a user as it is submitted.

This is normally used in commercial systems where a transaction may be a booking, an order or an invoice. Each transaction is completed before the next is begun.

Multi-access systems allow several users apparently to have individual control of the computer at the same time. One method of implementing a multi-access system is by allocating a period of time to each user; this is called **time-sharing**. See also *time slice*, page 164.

Real-time system is one that can react fast enough to influence behaviour in the outside world; for example, this is necessary in air-traffic control systems and desirable in on-line reservation systems.

Interactive processing provides the user with direct, immediate responses from the system. There is often some kind of dialogue with the system. Examples include the booking of airline tickets and requesting information about a bank account through a cash-dispensing machine.

Remote access or **tele-processing** is the use of a geographically remote computer system via communications links. See also *remote job entry*, page 282.

Off-line processing occurs when computer devices are not under the immediate control of the main computer, for example data entry to disk or tape storage.

On-line processing allows the user to interact directly with the main computer.

Channel

including: channel number, handle, port, port number

is any physical path along which data may be transmitted between two points. The physical path may be a separate wire, a group of wires or may be shared with other channels on a single wire (see *multiplexor*, page 164).

The data a channel carries may be a radio or TV signal, communications between two computer devices (for example music systems) or between a computer and its peripherals. Although different devices work totally differently, they are simply sending or receiving data, but along different physical routes.