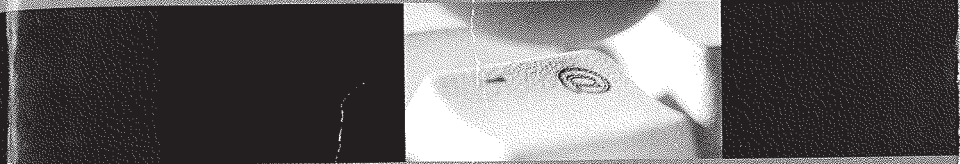
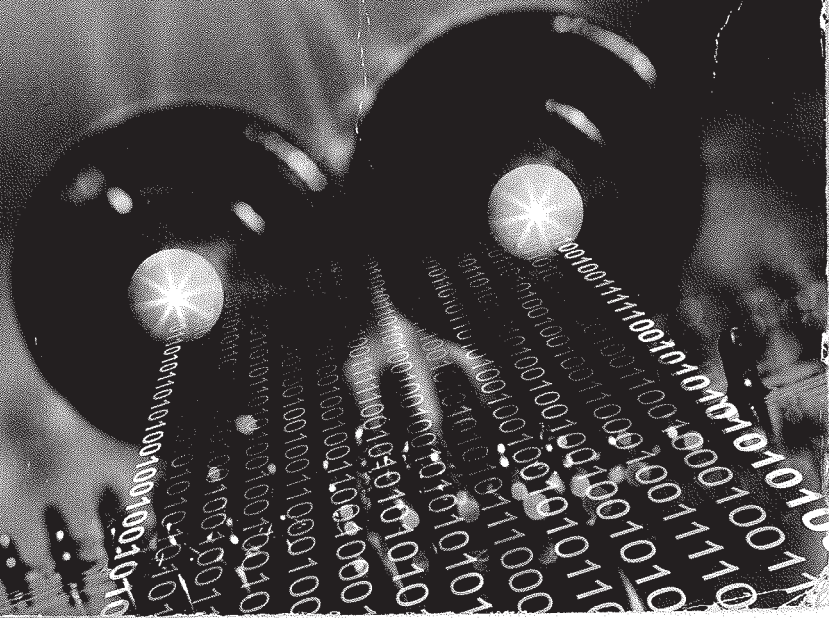


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The facility to mod- *logical or *storage quent requirement or programs inter- se nor any need to data independence ation for the devel- anagement soft- m and different ent levels of data ticularly important ases that are re- e with user needs. ndependence fre- the need for effi- and usually promise in terms of es used. *Logical data* ne facility to change e; thus evolve the e; *physical data inde-* acility to change the us modify and im-

ance to alteration ta stored in a com- that denotes only alteration of data. reliability of data edia, in terms of the errors (see ERROR detected error rate

perceived by the host system may be worse than that arising at the magnetic disk or tape if undetected errors can arise, e.g. from the effect of noise on connecting cables where the interface concerned has insufficient error detection capability.

From a system point of view the undetected error rate of a peripheral may be inadequate: the system can improve on it by making additional provision for checking in software.

data item The *representation of any value that can be used alone or as a component of a *data structure.

data link A physical connection between two or more devices (called *nodes* or *stations*) by a communication channel that appears "wirelike", i.e. bits arrive in the order sent. Coaxial cables, telephone lines, optical fibers, lasers, and even satellite channels can be data links. Data links are assumed to be susceptible to noise (i.e. have error properties) and have finite data rate and nonzero propagation delay.

data link control protocol A communication *protocol that converts noisy (error-prone) *data links into communication channels free of transmission errors. Data is broken into *frames, each of which is protected by *checksum. Frames are retransmitted as many times as needed to accomplish correct transmission. A data link control protocol must prevent data loss caused by mismatched sending/receiving capacities. A *flow control procedure, usually a simple sliding *window mechanism, provides this function. Data link control protocols must provide *transparent data transfer. *Bit stuffing or byte stuffing strategies are used to mask control patterns that occur in the text being transmitted. Control frames are used to start/stop logical connections over links. *Addressing may be provided to support several *virtual connections on the same physical link.

data link layer of network protocol function. See SEVEN-LAYER REFERENCE MODEL.

data logging A procedure that involves recording all data and interactions that pass through a particular point in a system. The point chosen is usually part of a communication loop or a data path to or

from a device such as a keyboard and display on which data is transitory. If a system failure or an unexpected result occurs it is possible to reconstruct the situation that existed. Such logs are not generally archived and can be overwritten once the associated job has been completed. See also DATA CAPTURE.

data management A term normally used to refer to systems that offer users an interface that screens them from the majority of the details of the physical handling of the files, leaving them free to concentrate on the logical properties of the data.

data management system A class of software systems that includes *database management systems and *file management systems.

data manipulation, data manipulation language See DATABASE LANGUAGE.

data mark See ADDRESS MARK.

data matrix A rectangular array of data variables, which may be numerical, classificatory, or alphanumeric. The data matrix forms the input structure upon which statistical procedures for *regression analysis, *analysis of variance, *multivariate analysis, *cluster analysis, or survey analysis will operate.

data medium A material having defined properties, including a physical variable that can be used to represent data. The defined properties ensure that the medium is compatible with devices that can record or read data on the medium. Examples of data media are *magnetic tape, *magnetic disks, and *optical disks, and also paper used for printer output.

data mining The nontrivial explication or extraction of information from data, in which the information is implicit and previously unknown; an example is identification of the pattern of use of a credit card to detect possible fraud. The data is normally accessed from one or more databases, so the technique is also known as *knowledge discovery in databases (KDD)*. It involves a number of different methods from artificial intelligence such as neural networks and machine induction, together with statistical methods such as cluster analysis and data summarization.

data model An abstract model of some real-world situation or domain of interest about which information is to be held in a *database and which the *logical schema for that database encodes. The term data model (or data modeling method) is also used for a set of logical abstractions employed in constructing such a model. See also RELATIONAL MODEL, HIERARCHICAL DATA MODEL, CODASYL NETWORK MODEL.

Data Module The name used by IBM to refer to their removable, hermetically sealed disk pack, incorporating the read/write heads and carriage assembly, that was used with the 3340 *Winchester technology disk drive. Current data-processing systems use fixed disk storage; however, the term data module was once in general use and was interchangeable with the terms disk pack and storage module.

data name In data-processing languages, a symbolic name chosen by the programmer to identify a data object. See also VARIABLE.

data network A communication network that is devoted to carrying computer information, as opposed to voice, video, etc. It consists of a number of nodes, or stations, connected by various communication channels.

data path Another name for data bus, although often used in a wider context to mean any logical or physical connection between a source and destination of digital or analog information.

data preparation An obsolete term for the process of converting data into a machine-readable form so that it can be entered into a system via an available input device. There is no interaction with the system in the course of preparation. The process has been superseded by direct *data entry systems and *data capture.

data processing (DP) A term used predominantly in the context of industrial, business, governmental, and other organizations: within that context it refers (a) to a class of computer applications, (b) to a function within the organization.

While it is hard to generalize, data-processing applications may be characterized as those that store and process large