Data

For data in computer science, see Data (computing). For other uses, see Data (disambiguation).

Data (/ˈdeɪtə/ ***DAY****-tə*, /ˈdætə/ ***DA****-tə*, or /ˈdɑːtə/ ***DAH****-tə*)[1] is a set of values of qualitative or quantitative variables; restated, pieces of data are individual pieces of information. Data is measured, collected and reported, and analyzed, whereupon it can be visualized using graphs or images. Data as a general concept refers to the fact that some existing information or knowledge is *represented* or *coded* in some form suitable for better usage or processing.

Raw data, i.e. unprocessed data, is a collection of numbers, characters; data processing commonly occurs by stages, and the "processed data" from one stage may be considered the "raw data" of the next. Field data is raw data that is collected in an uncontrolled in situ environment. Experimental data is data that is generated within the context of a scientific investigation by observation and recording.

The word "data" used to be considered the plural of "datum", and still is by some English speakers. Nowadays, though, "data" is most commonly used in the singular, as a mass noun (like "information", "sand" or "rain").[2]

1 Meaning of data, information and knowledge

Data, information and knowledge are closely related concepts, but each has its own role in relation to the other. Data is collected and analyzed to create information suitable for making decisions,[3] while knowledge is derived from extensive amounts of experience dealing with information on a subject. For example, the height of Mt. Everest is generally considered data. This data may be included in a book along with other data on Mt. Everest to describe the mountain in a manner useful for those who wish to make a decision about the best method to climb it. Using an understanding based on experience climbing mountains to advise persons on the way to reach Mt. Everest's peak may be seen as "knowledge".

That is to say, data is the least abstract, information the next least, and knowledge the most.[4] Data becomes information by interpretation; e.g., the height of Mt. Everest is generally considered "data", a book on Mt. Everest geological characteristics may be considered "information", and a report containing practical information on the best way to reach Mt. Everest's peak may be considered "knowledge".

'Information' bears a diversity of meanings that ranges from everyday to technical. Generally speaking, the concept of information is closely related to notions of constraint, communication, control, data, form, instruction, knowledge, meaning, mental stimulus, pattern, perception, and representation.

Beynon-Davies uses the concept of a sign to differentiate between data and information; data is a series of symbols, while information occurs when the symbols are used to refer to something.[5][6]

It is people and computers who collect data and impose patterns on it. These patterns are seen as information which can be used to enhance knowledge. These patterns can be interpreted as truth, and are authorized as aesthetic and ethical criteria. Events that leave behind perceivable physical or virtual remains can be traced back through data. Marks are no longer considered data once the link between the mark and observation is broken.[7]

Mechanical computing devices are classified according to the means by which they represent data. An analog computer represents a datum as a voltage, distance, position, or other physical quantity. A digital computer represents a piece of data as a sequence of symbols drawn from a fixed alphabet. The most common digital computers use a binary alphabet, that is, an alphabet of two characters, typically denoted "0" and "1". More familiar representations, such as numbers or letters, are then constructed from the binary alphabet.

Some special forms of data are distinguished. A computer program is a collection of data, which can be interpreted as instructions. Most computer languages make a distinction between programs and the other data on which programs operate, but in some languages, notably Lisp and similar languages, programs are essentially indistinguishable from other data. It is also useful to distinguish metadata, that is, a description of other data. A similar yet earlier term for metadata is "ancillary data." The prototypical example of metadata is the library catalog, which is a description of the contents of books.

2 In other fields

Though data is also increasingly used in other fields, it has been suggested that the highly interpretive nature of them

might be at odds with the ethos of data as "given". Peter Checkland introduced the term *capta* (from the Latin *capere*, "to take") to distinguish between an immense number of possible data and a sub-set of them, to which attention is oriented.[8] Johanna Drucker has argued that since the humanities affirm knowledge production as "situated, partial, and constitutive," using *data* may introduce assumptions that are counterproductive, for example that phenomena are discrete or are observer-independent.[9] The term *capta*, which emphasizes the act of observation as constitutive, is offered as an alternative to *data* for visual representations in the humanities.

3 See also

- Biological data
- Data acquisition
- Data analysis
- Data cable
- Data domain
- Data element
- Data farming
- Data governance
- Data integrity
- Data maintenance
- Data management
- Data mining
- Data modeling
- Data visualization
- Computer data processing
- Data publication
- Data remanence
- Data set
- Data warehouse
- Database
- Datasheet
- DATA - Digital Asset Transfer Authority
- Environmental data rescue
- Fieldwork
- Metadata
- Scientific data archiving
- Statistics
- Computer memory
- Data structure

4 References

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[1] The pronunciation /ˈdeɪtə/ ***DAY***-*tə* is widespread throughout most varieties of English. The pronunciation/ˈdætə/ ***DA***-*tə* is chiefly Irish and North American. The pronunciation /ˈdɑːtə/ ***DAH***-*tə* is chiefly Australian, New Zealand and South African. Each pronunciation may be realized differently depending on the dialect of the speaker.

[2] Hickey, Walt (2014-06-17). "Elitist, Superfluous, Or Popular? We Polled Americans on the Oxford Comma". FiveThirtyEight. Retrieved 2015-05-04.

[3] "Joint Publication 2-0, Joint Intelligence" (PDF). *Defense Technical Information Center (DTIC)*. Department of Defense. 22 June 2007. pp. GL–11. Retrieved February 22, 2013.

[4] Akash Mitra (2011). "Classifying data for successful modeling".

[5] P. Beynon-Davies (2002). *Information Systems: An introduction to informatics in organisations*. Basingstoke, UK: Palgrave Macmillan. ISBN 0-333-96390-3.

[6] P. Beynon-Davies (2009). *Business information systems*. Basingstoke, UK: Palgrave. ISBN 978-0-230-20368-6.

[7] Sharon Daniel. *The Database: An Aesthetics of Dignity*.

[8] P. Checkland and S. Holwell (1998). *Information, Systems, and Information Systems: Making Sense of the Field*. Chichester, West Sussex: John Wiley & Sons. pp. 86–89. ISBN 0-471-95820-4.

[9] Johanna Drucker (2011). "Humanities Approaches to Graphical Display".

5 External links

- Data is a singular noun (a detailed assessment)

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6.1 Text

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