Definition of a format or formatting:

1. Format is the way in which something is arranged or set out.
2. A format is a preestabilished layout for data

Note: Data space can be divided evenly by a system of measurement.

* A recording format is a format for encoding data for storage on a storage medium
* Multiple levels of encoding may be achieved in one format
  + ex.: A text encoded page may contain HTML and XML encoding of data, combined in a plain text file format, using EBCDIC or ASCII character encoding, on a UDF digitally formatted disk
  + X encoding of data, combined in plain text format using ASCII character encoding, together with UML diagrams

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Convergent thinking is a term, which is the opposite of Divergent thinking.

**Convergent thinking**

It generally means the ability to give "correct" answer to standard questions that do not require significant creativity, for instance in most tasks in school and on standardized multiple-choice tests for intelligence.

**Relevance**

A thinking that focuses on coming up with the single, well-estabilished answer to a problem.

Emphasizes speed, accuracy, and logic.

Focuses on recognizing the familiar reapplying techniques, and accumulating stored information.

Convergent thinking is used in Conjunction with divergent thinking.

Divergent thinking typically occurs in a spontaneous, free-flowing manner, where many creative ideas are generated and evaluated.

* Divergent thinking generates many ideas, which are evaluated to certain criteria

Ideas and information are organized and structured using convergent thinking to decision making strategies are used leading to a single-best, or most often correct answer. Examples of divergent thinking include using brainstorming, free writing and creative thinking at the beginning of the problem solving process to generate possible solutions that can be evaluated later.

Once a sufficent number of ideas have been explored, convergent thinking can be used.

Knowledge, logic, probabilities and other decision-making strategies are taken into consideration as the solutions are evaluated individually in a search for a single best answer which when reached is unambiguous.

* Convergent thinking following divergent thinking results in unambiguous statements or answers to solutions for problems.

Recording format is a format for encoding data for storage in a computer file

* example of a recording format:

Data type is a constraint placed upon the interpretation of data in a type system

* Example of such a constraint
* Is the interpretation of every Data type ambiguous?
* When is the interpretation of every Data type ambiguous?

Data structure is a data organization, managemend, and storage format that enables efficent access and modification.

Question:

How is Recording format related to Data Structure?

How data becomes information or knowledge?

What is the difference between information and knowledge.

Statements:

* **Records** are among the simplest data structures.
  + Elements of records are called fields or members
* A **set** as a data structure is a computer implementation of the mathematical concept of a finite set.
* An **object** contains a number of data fields, like a record, and also a number of subroutines for accessing or moifying them, called methods.
  + A value of a key might be a record
    - In this case, the value of the key is a data structure
* A **type** is a set of values which a variable can possess and a set of functions that one can apply to these values.

Machine-readable mediums exist for data storage

**Conclusion:**

A Data Structure might have a recording format for storing it's data on a Machine-readable medium.

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A **content format** is an encoded format for converting a specific type of data to displayable information

* If a data has a type, then a content format can encode it to displayable information
* They are used in recording and transmission to prepare data for observation or interpretation.
* They may be recorded and read by either natural or manufactured tools

Observable data is often known as raw data, or raw content.

* Raw data is also known as primary data.
* Raw data is a data colected from a source

Example of content format:

* Document file format
* Audio data encoding
* Visual data encoding
* Motion graphics encoding
* Natural language format
* Communication signaling formats
* Code formats
* Expert language formats

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**Information** is processed, organized and structured data.

It provides context for data and **enables decision making process**.

* The bold term above is a function of information

Let x be a single customer's sale at a restaurant.

x Is then data.

x becomes information when the business is able to identify the most popular dish.

Question: Is there a function f, which assigns the values data or information to objects or records within a database?

Information is associated with data. The difference is that information resolves uncertainty

Question.: How is uncertainty defined?

Answer:

* Uncertainty refers to epistemic situations involvin
  + The epistemic Basing Relation is the relation which holds between a reason and a belief if and only if the reason is a reason for which the belief is held
  + It is generally thought to be a necessary, but not sufficent, condition for a belief's being justified that the belief be based on a reason.
  + https://plato.stanford.edu/entries/basing-epistemic/#:~:text=The%20epistemic%20basing%20relation%20is,be%20based%20on%20a%20reason.

Uncertainty can be presented using a decision node.

* Egy döntési csomópont élein ha elhelyezünk őrfeltételeket, akkor a bizonytalanságra megoldást találhatunk.
* Ha a folyamatmodell minden döntési pontjára („decision” csomópont) olyan őrfeltételeket írunk, hogy mindig legfeljebb egy ág legyen engedélyezett, akkor determinisztikus a folyamat; teljesen specifikáltnak pedig akkor nevezzük, ha mindig legalább egy ág engedélyezett.

Data can represent redundant symbols, but approaches information through **data compression**.

* Lásd: Logika egyszerűsítése

Information can be transmitted in time, via data storage, and space, via communication and telecommunication.

Information is expressed either as the content of a message or through direct or indirect observation.

That which is perceived can be constructed as a message in its own right, and in that sense, information is always conveyed as the content of a message.

Information can be encoded into various forms for transmission and interpretation

* Example:
* Information may be encoded into a sequence of signs, or transmitted via a signal
* It can also be encrypted for safe storage and communication

Information theory is the scientific study of the quantification, storage and communication of information.

Entropy quantifies the amount of uncertainty involved in the velue of a random variable or the outcome of a random process.

Ronaldo Vigo Information is a concept that requires at least two related entities to make quantative sense.

1. Any dimensionally defined category of objects S, and any of its subsets R
2. R, in essence, is a representation of S, or, in other words, conveys representational (and hence, conceptual) information about S.

Vigo then defines the **amount of information that R conveys about S** as the **rate of change in the complexity of S** whenever the objects in R are removed from S.

Under "Vigo information", pattern, invariance, complexity, representation, and information – five fundamental constructs of universal science – are unified under a novel mathematical framework.

**As an influence that leads to transformation**

Information is any type of pattern that **influences** the formation or transformation of other patterns.

In this sense, there is no need for a conscious mind to perceive, much less appreciate, the pattern.

* Systems theory at times seems to refer to information in this sense, assuming information does not necessarily involve any conscious mind, and patterns **circulating** in the system can be called information
  + What types of patterns circulate on facebook?
    - What type of information do these patterns cover related to human behaviour?
    - Az emberi viselkedésnek milyen mintázatai nyilvánulnak meg a facebookon, mint rendszeren belül, mint keringést mutató mintázatok.

Information is **interpretable**

* The specific context (category) associated with this interpretation may cause the **transformation** of the information into knowledge.

Tools and processes are used to assist a knowledge worker in performing research and making decisions, including steps such as:

* Review information to effectively derive value and meaning
* Reference metadata if available
* Estabilish relevant context, often from many possible context (Categories)
* Derive new knowledge from the information
* Make decisions or recommendations from the resulting knowledge.
  + Labels: Logic, Stanford, Youtube

**As records**

Records are specialized forms of information.

Records are information produced consciously or as by products of business activities or transactions and retained because of their **value**

* Their value is as evidence of the activities of the organization
* They may also be retained for their informational value. (lásd: Entropy)

ISO 15489's definition of record

* Information created, received, and maintained as evidence and information by an organization or person, in pursuance of legal obligations or in the transaction of business"

ICA's definition of a record

* Recorded information produced or received in the initiation, conduct or completion of an institutional or individual activity and that comprises content, context and structure sufficent to provide evidence of the activity.

Sound management of business records and information delivered "...six key requirements for good corporate governance...transparency; accountability; due process; compliance; meeting statutory and common law requirements; and security of personal and corporate information."

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Knowledge is a familiarity or awareness, of someone or something, such as facts (descriptive knowledge), skills (procedural knowledge), or objects (acquaintance knowledge) contributing to ones understanding.

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Derive Descriptive knowledge and Procedural knowledge from information, by interpretation.

**Questions:**

How to get to information from Data? How does data transform into knowledge?

What is the right data structure for storing records?

The goal is to store the properties, descriptions, and processes of a system in an efficent way

How does the functionality of a record "megnyilvánulni" in a Data Structure?

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**Data processing** is the collection and manipulation of items of data to produce meaningful information. In this sense it can be considered a subset of information processing, which is the change (processing) of information in any manner detectable by an observer.

Data processing functions

* Validation
  + From precise data formats validatation can be achieved
* Sorting
  + Algorithms ☺
* Summarization
  + Statistics and or Analysis ☺
* Aggregation
  + Relations, Databases
* Analysis
  + Statistical inference
* Reporting
  + From a Data and a Form a report can be created
* Classification
  + Separation of data into various categories
    - Example might be classification using labels

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**Information processing** is the change of information in any manner detectable by an observer.

As such, it is a process that describes everything that happens in the universe

* Examples: A rock falls from the sky
* A digital computer system prints a text file.
  + In this case, an information processor (printer) is changing the form of presentation of that text file (from bytes to glyphs).
  + The computers up to this period function on the basis of programmes saved in the memory, they have no intelligence of their own.

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Document file format will be PDF

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Filtering

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**Data type**

An attribute of an object of a programming language which tells the compiler how the user inteds to use the data

* Primitive types
* Array
* Record
* Object

**Interface**

* Shared boundary across which two or more separate components of a computer system exchange information
* The exchange can be between software, computer hardware, peripheral devices, humans, and combinations of these.
* A software interface may refer to a wide range of different types of interface at different "levels": an operating system may interface with pieces of hardware.
  + Applications or programs running on the operating system may need to interact via data streams, filters, and pipelines;
    - In object oriented programs, objects within an application may need to interact via methods.
* In some object-oriented languages, especially those without full multiple inheritance, the term interface is used to define an abstract type that contains no data but defines behaviours as method signatures.
  + A class having code and data for all the methods corresponding to that interface and declaring so is said to implement that interface.
* An interface is thus a type definition
* Anywhere an object can be exchanged (for example, in a function or method call) the type of the object to be exchanged can be defined in terms of one of its implemented interfaces or base-classes rather than specifying the specific class.
* A user interface is a point of interaction between a computer and humans; it includes any number of modalities of interaction (such as graphics, sound, position, movement, etc.) where data is transferred between the user and the computer system.