

Philosophical aspects of information

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Abstract

The information as a scientific category is a primary notion which can not be defined. The information is not a material metric but is an intellectual one, because it can arise only as a result of intellectual activity. In practice the information can be found as data, algorithms and goal-vectors. The information has five levels: statistics, syntax, semantics, pragmatics, and apobetics. The information is a way to depict existing things, and so it can substitute them. Hence, any information, which is stored on Earth, can be viewed as the global model of the real world. Considering the properties of information we can solve one of the basic question of philosophy: “What was first: the intellection or the material?”. The answer of informatics for this basic question is that the primary one is the intellection.

1. General properties of information

The inventing of the structure of the Deoxyribonucleic acid (DNA) shows that the information is an important concept not just for Computer Technology but for other disciplines as well [1]. The information is a basic category just like the material and the energy. But the attributes of the material and the energy are different from those that connected to the material world where the conservation laws prevail. The information is an intellectual category because we do not know such material process which can be source of information. Creative information can come off only by the will of such sender who has intelligence. The information is being used in form of data, algorithms and goals.

For the representation of the information a code-system (code, set of symbols) is needed (letters, Morse code, hieroglyphs, genetic-code, etc.). The selection of a code-system always represents an intellectual idea and based on convention. If there has been an arrangement about the code-system then the sender and the receiver have to observe it strictly.

There can be five hierarchal aspects about the information: statistic, syntax, semantics, pragmatics, and apobetics [2]. The statistic is the code, the lowest level

of information which does not deal with the content of the information. The syntax is the structural parameter of the representation of information. By the given syntax the words in a text can be eventuated in a particular sequence. The grammatical rules are based on a convention in every language. In the interpretation of information there is not a determinate role for the code or the syntax but for the inner content, the semantics. The semantics is the central aspect of information.

Only those things which have semantics can be information. The semantics is the invariant part of the information because it does not change when we change the statistical and syntax levels of the information. The pragmatics reflects the goal that the sender wants to achieve at the receiver. The obtained information has to generate the proper action at the receiver. The apobetics (goal, result) is the highest level of information which represents the goal of the sender.

The sender usually does not inform his real goal to the sender and in that case the apobetical and pragmatic aspects of the information are not in line with each other. This situation refers to manipulation. These kind of problems do not appear at the mechanical systems because at that case the components of the system do not have separate purposes.

We can categorize the information by its origin, its use, and its importance.

The classification of the information by its origin can be creative, reproduced, and copied. The creative information is a result of an intellectual process and connected to a person who has willpower and goals. To create creative information, existing information and algorithms are needed. The reproduced information can be interpreted that way: the composition, created by the composer is the creative information, and by that the orchestra makes the reproduced information. The copied information is created by the copy of existing information. In that case, information does not arise from nothing. This is an automatic, mechanical process.

From the application's point of view there are produced, operational, communicational information. By its importance, it can be very important, important, useful, insignificant, and harmful information. This classification is subjective.

The information's important attribute is its substitute function. The information can be regarded as an abstract representation of existing things (processes). Since these things (processes) are not present at the receiver either in time or locally, the information fill in the substitute function. By the substitute function, the information is the basic of the model of the real world. The most important scientific tool is the mathematical modeling. In the mathematical models it is helpful to use the concept of *phase space*. In the phase space the parameters of an object are a *phase vector*

$$(x_1, x_2, \dots, x_n).$$

And we can say that the object is in (x_1, x_2, \dots, x_n) state. If the phase vector of the object changes, then the object will get into other state. If the object's phase-vector changes, the object is transferred to other state. The models that contain the controlling are extended by control *variables*

$$(u_1, u_2, \dots, u_m),$$

they can change the state of the guided object, and it leads to the “moving” of the subject in the phase-space.

The phase-space is an important instrument, with this the model can describe the guided object’s “moving”.

For the control of an object all of the 3 types of the information are needed.

- **Goals.** The objective function (objective-vector) describes the goals that are connected to the object, and defines the quality of the control. With the help of the goal-functions we can compare the different guiding strategies.
- **Data.** The phase-vector, which describes the state of the guided object, are necessary for the control system to always “know”, what kind of state the object is in, what kind of state it has to be carried to, and what kind of values the controlling variables get.
- **Algorithms.** The control always happens by an algorithm, which contains the solution of the problem of the mathematical model. This algorithm relates the decisions, what are intellectuals, with those changes, that happen in the material world.

This means that *the planning and working of any type of a control system requires a proper intellectual activity.*

Ideal control does not exist in practice, because the guided object can be different from the planed trajectory. That is why the system has to contain a *feedback*. By that the controlling component gets the information about the real state of the controlled object, and with that it can reduce the offsets from the pre-calculated “program” state.

2. The ultimate question of philosophy

The main question of the philosophy was formed like this:

“What is primary: the spirit or the material?” [3]

We try to approach the main question of the philosophy from the aspect of the information. In principle the parameters of an object can be described by an (x_1, x_2, \dots, x_n) phase-vector. Then the temporal changes of the object’s state make a

$$(x_1(t), x_2(t), \dots, x_n(t))$$

trajectory in the phase-space. The object in the phase-space can get from an initial state to the final state by the proper “moving”:

$$(x_1, x_2, \dots, x_n) \rightarrow (y_1, y_2, \dots, y_n).$$

Because of the “moving” of an object in the phase-space can only be *regular* (*guided*) or *chaotic*, that is why we can rate them into two groups.

The either of them belongs to those type of objects, what have *regular* “moving”, to the other, what have *chaotic* “moving”.

- In the case of the *chaotic, spontaneous “moving”* there does not exist such algorithm, that can describe the “moving”, and so we can not evaluate the future state of the object.
- The *regular “moving”* in principle can be described by an algorithm. We can say, that the regular “moving” is always guided, and for this a sufficient *informatical background* needed.

If we can describe a regular “moving” mathematically, then by the mathematic model the future state of the object is definable. For example in the case of the Earth and other planets this can be punctually definable (in limited time-interval). As we know, behind of an information process there always stands an individual with intellectual will. So, if a “move” is regular, then the necessary condition of that is an *intellectual component* that belongs to the object, and by that it is able to the fulfillment of the “moving” by the sufficient information (goals, data, algorithms).

If the “moving” of a material object is regular, then necessarily an intellectual (spiritual) component belongs to it too. The intellectual component of the object contains:

- goal-vector (the “moving” goal)
- the initial and final state of the object
- the algorithm of the “moving”
- the control feedbacks

Without an intellectual component the object’s “moving” can only be chaotic. For example, a baby, as a “material” object, in the first weeks of his life is only able to chaotic move, because his intellectual component is immature yet, and does not have a sufficient informatical background. The control of the “moving” of the guided object can be *internal (integral)* or *external*.

Examples for objects that contain internal control:

- automated technical systems
- control system for the fly of migratory birds
- Information which is stored in the DNA, by what the synthesis of protein happens.

In the case of the *external control* the information which is required for the control of the “moving” gets into the object by an external way. Its example is driving of a car.

The possibilities of the object’s “moving” define its *dynamic features*. It may happen that an object does not need to have a dynamic feature. For example, we does not expect from a chair to have a dynamic feature.

We know it from the practice, that *the more complex the dynamic feature of an object, the more complex the object's intellectual component*. Formally we can express it in this way:

If B_k is the complexity of the k -th object, I_k is the intellectual power equipment what is necessary for the “moving” of the k -th object, and

$$B_1 < B_2 < \dots < B_{n-1} < B_n,$$

then it is true, that

$$I_1 < I_2 < \dots < I_{n-1} < I_n.$$

Now the fact, that the human' complexity, as an object, eminently exceeds the complexity of any type of objects, is accepted that

$$B_k \ll B_{e.sz},$$

where $B_{e.sz}$ - signs the human, as object, B_k - is the object which is made by the human. This means, that

$$I_k \ll I_{e.sz},$$

There does not exist any artificially made object that may require so high level intellectual source, as the human's “planning” and “making”.

If we know about an object that it came into being by a spontaneous way, than in this case it does not need an intellectual source at all, and the goal-vector is missing too.

That one, who says that the living world, including the human, came into being by a spontaneous way, that one formally declares, that

$$B_k \ll B_{e.sz} \text{ and } I_{e.sz} = 0$$

are true simultaneously. (The value 0 means that it does not need any intellectual source at all).

This is an absurd assertion, because the making of the simplest object needs an intellectual source too.

Because, the regular “moving” is typify to the world, and not the chaotic, that is why the definite answer to the main question of philosophy, by the previous analysis, is-

the primary is the spirit.

Assertion “primary is the spirit” is true in the both of interpretations.

- Before of a regular “moving” the algorithm of the “moving” is realized in the object's intellectual (spiritual) component.
- The spiritual component of an object is more primary, more important than the material component of the object, because it is dynamic features depend on the intellectual (spiritual) component.

The humans in their everyday life, intuitively accept, that the spirit is primary – they consider the spiritual “procedures” more important, than what happened in the material world. For example, if a tram or a bus, in what the passengers travel on foot, suddenly brakes, and somebody steps on our foot, we does not get peeved, because it was not intentional. And vice versa, if somebody wants to step on our foot, but it does not succeed (he steps aside), this can displease us – for us it is more important the intent of the person, than the “moving” made in the material world. In the same way one is not angry with a child, who breaks an expensive thing.

It belongs to the subject, that V. D. Plikin (В. Д. ПЛЫКИН), a Russian information science professor, made the Inquiry model of the Universe [4] at the end of the 20-th century. The model results, that there is no place for the chaos in the Universe, there is order and harmony everywhere, and *beside the process what happens in the material world there is always the Intellectual component, the Creator.*

References

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