

Proceedings

Pushing Forward the Science-Philosophy Cooperation: Seeking Better Solution for fundamental Issues in Information Studies[†]

Yixin Zhong*

* Correspondence: zyx@bupt.edu.cn; Tel.: +86-137-0123-0645

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Abstract: How to properly understand the concept of information is the real foundation for both studies in information science and information philosophy. This may commonly be accepted by all of us as information researchers. Unfortunately, such a problem has not been solved satisfactory till the present time. This kind of problem could be solved by the joint efforts from the researchers of both information science and philosophy.

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How to properly understand the concept of information is the real foundation for both studies in information science and information philosophy. This may commonly be accepted by all of us as information researchers. Unfortunately, such a problem has not been solved satisfactory till the present time. The evidence is the numerous definitions of information in literature:

Wiener wrote in <Cybernetics and Society> that information is the name of the contents that are exchanged between humans and the environment ^[1].

Shannon considered in “A Mathematical Theory of Communication” that information is what can be used for reducing uncertainty ^[2].

Bateson described in <Steps To An Ecology of Mind> that information is the difference that makes difference ^[3].

There have been many more and some new ones may still come. What is embarrassing is that, when discussing the concept of information, some ones may mean “object information” in their mind while other ones’ concern may be the “perceived information”, although both group are talking about “information” – Using the same words expresses different meanings.

What is meant by each of these definitions? Are they the same? Or they are different? Can we, information philosophers and scientists, find a universal statement that grasps the essence of information and thus accepted by all users?

The answer should be “yes”. The right way to solve such a kind of fundamental problem is to have better collaboration between information scientists and information philosophers: **employing the principle of philosophy – methodology – for solving scientific problem.**

To the author’s knowledge, the failure of having a unified definition of information accepted by researchers in all fields is due to the following fact: The methodology of reductionism, which is featured with “divide and conquer” and has been proved very successful in matter science studies, has been widely employed in information discipline so that the discipline having been divided into a great number of pieces, each of which has its own understanding toward the concept of information, leading to the diversity in concept understanding.

Due to the radical difference in property between matter science and information science, the methodology, which can properly be employed for dealing with the information process, is the one named “information ecology” featured with integrity, deduction, and interaction between subject and object, as is seen in the model below: the lower part of the model stands for object in environment while the upper part represents the subject. And the interaction between the subject and object is carrying on through the following process: On one hand, the object gives to the subject with object information and on the other hand the subject gives to the object with intelligent action. From object information to intelligent action do form an entire process, an ecological process of information.

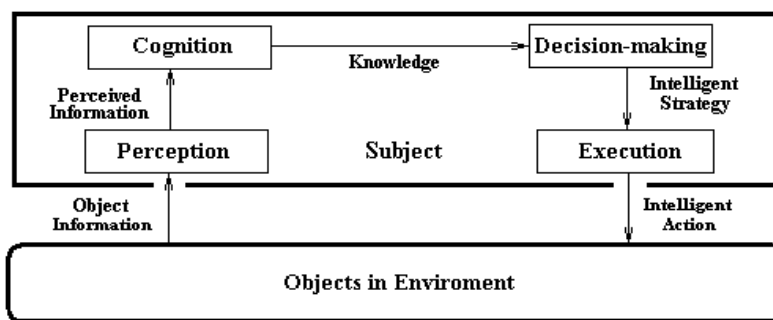


Fig.1 Model of Ecological Process of information

More specifically, the information ecology considers the ecological process of information within the framework of subject-object interaction, that is: object information → perceived information → knowledge → intelligent strategy → intelligent action. In other words, **the ecological process of information consists not only of the object information and the perceived information but also of the products of information, the knowledge and intelligence (intelligent strategy and intelligent action).**

Why is the ecological process of information important and significant for human beings? This can easily be explained from Fig.1. On one hand, **through the ecological process of information, human subject can perceive information from environment and then can produce intelligent action for reacting to the environment.** On the other hand, **through the ecological process of information, the subject can adjust himself (itself) so as to adapt to the environment.** These are the most fundamental activities for humans to perform within their lifetime.

If all researchers hold the methodology of information ecology, the understanding of the concept of information would be gradually reaching to the agreement as stated below.

(1) There are two categories of information: object information and perceived information, rather than one category.

(2) The object information is referred as the state of the object and the pattern with which the state may vary, all of which are presented by the object itself.

(3) The perceived information is referred as the form (named syntactic information), meaning (named semantic information), and utility (named pragmatic information) of the state/pattern perceived by the subject from the object information.

Considering that the “the name of the content exchanged between humans and environment” stated by Wiener, “the uncertainty the communication users faced” described by Shannon, and “the difference that makes difference” proposed by Bateson, all are some function of “the states of object and the pattern with that the states varying”, and the latter are similar to the gene expression in biology, we can therefore have the following conclusion:

(4) The definitions given by Wiener, Shannon, Bateson, and others are special cases of the definitions (1) in respective instances.

(5) Whenever the perceived information is in consideration, the syntactic, semantic, and pragmatic information should be taken into account.

As we have seen from the discussions above that, by employing the means of philosophy (methodology), the fundamental issue in scientific research of information discipline could find better solution. In China, we have good cooperation between information scientists and information philosopher.

References

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