

# The place of information and knowledge in the structure of labor

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**Abstract:** *Many social researchers and economists observe changes in the structure of labor in contemporary society, pointing out information and knowledge as key elements of labor. Still analysis of that content is often hampered by the confusion of terms, and objectionable simplification. This article suggests some approaches to introduce clarity in the role of information and knowledge in the structure of labor.*

**Keywords:** Information society, Knowledge society, labor, descriptive knowledge, prescriptive knowledge, knowledge and information dialectics.

## Introduction

The popularity and spread of the "information society" and "knowledge society" concepts were much stipulated by the achievements of high-tech sectors of industry and it comes as no surprise that first of all the new phenomenon awoke a great interest on the part of economists. It is also illustrated by the fact that the first reports of the state program mentioning "Information society" were focused on the economic development such as "The information economy: Definition and Measurement" in the USA (1977) or "The plan for information society: A national goal toward the year 2000" in Japan (1971).

It is also significant that the idea of "knowledge society" also appeared in state policy papers as expansion of economic ideas to wider social scope. Indeed in some official papers such as Presidency Conclusions of Lisbon European Council (2000), terms "knowledge society" and "knowledge based economy" are used interchangeably.

Furthermore, we can find strong influence of the economic approach on the simplified understanding of information and knowledge for example in UNESCO report "Towards knowledge societies" (2005). There information is understood as some specific kind of "raw" knowledge that needs processing in order to be transformed into full-bodied knowledge. Here some reductionism takes place when the human brain is regarded as a mechanism that processes information into knowledge. And the ability to perform such processing merely depends upon necessary education.

We suppose that such reductionism can be explained by the wide adoption of C.Shannon's communication theory among economists that was later transformed to the statistical approach for the definition of information. This way of thinking tacitly but strongly influenced economic thought, causing serious vagueness in the analysis of present-day human activities.

### 1. Problem of terms clarity

Statistical approach turned out to be inadequate in socio-humanitarian disciplines as focusing on aspects of communication. It neglects such substantial features of information as its sense and meaning for an acting subject (see Burgin, 2009). Still it gained certain popularity among social researchers, especially economists. It is evident that the given approach could gain no marked recognition without some favorable grounds in the methodological foundations of the main stream of modern economic thought.

The main methodological paradigm in the currently dominant school of microeconomics is a rational choice theory. The given theory is based on the assumption of the action rationality on the part of all the subjects within the economic interaction focusing on the own maximal benefit at minimal costs. At the same time, it is supposed that this very choice is made on the base of all the available information. Thus, there is the precondition that for the most rational behavior a subject merely needs the access to all possible information. In other words, a subject is supposed to possess the knowledge of the best possible action in given situation. In fact, here – and that is our point – the equality is drawn between information and knowledge and the problem of getting knowledge comes to the problems of communicatory noise and reliability of the communicative net that can provide essential information.

No wonder, that many researchers in economics use the words “knowledge” and “information” interchangeably. As a result, they encounter some difficulty when they are

to explain the differences between labor power in “information society” and that of “knowledge society”.

The first part of this assertion can be illustrated by the works of some renowned economists on the problems of “information economy” or “knowledge economy”. For instance, M.Porat offered to interpret information as

“data that have been organized and communicated” (Porat, 1977, 2),

emphasizing on the communication aspect. P. Drucker’s statement is significant here as well; according to him

“Knowledge, appropriate and systematic acquisition of information and its further application make the basis of modern economy” (Drucker, 2007, 18)

In fact, Drucker uses the terms “information” and “knowledge” interchangeably. F. Machlup attempted to distinguish between information and knowledge pointing out that:

“in some cases we can qualify knowledge as information but we should avoid generalizations of information and knowledge” (Machlup, 1962, 8).

However, describing the workers of new type – “knowledge workers” Machlup mixes the notions and proposes to understand them as the workers oriented at handling both information and knowledge. Apparently, in many respects such confusion of terms contributed to the optimism of predictions made by such researchers as T.Stonier and Y.Masuda. They assume that the growth of workers involved in acquiring and processing

information leads to the increase of overall knowledge in a society. It is worth mentioning that M.Castells being more cautious in his predictions, also mixes completely different types of activity (see Webster, 2006) describing a new type of a worker – “information worker”, apparently under the influence of the above-mentioned economists.

In general, the thesis that the workers` activity connected with the acquisition and processing of information is thereby closely associated with knowledge is beyond exception. Indeed, the semantic approach to the understanding of information points to the fact that the information in the human context should be primarily regarded as the source of knowledge (see Floridi, 2005).

The dispute is presented by the thesis that any worker`s activity connected with getting and processing information automatically contributes to knowledge increase. Apparently, the problem here lies also in the fact that Machlup and Drucker as well as other economists do not distinguish between different kinds of knowledge preferring rather general understanding of knowledge (see Mirovsky, 2009).

This provokes some difficulties in distinguishing specific kind of information (or knowledge) labor from other kinds of labor. In fact, any labor as purposeful activity requires certain knowledge from worker, what makes difference here is the kind of knowledge and the way it is implemented.

## 2. Different kinds of knowledge in labor structure

W.Vincenti assumed that the technological knowledge (Vincenti interprets term “technological knowledge” in broad sense as any knowledge that serves as the necessary condition for one`s activity) can be either descriptive or prescriptive and from the other perspective – explicit or implicit.

Descriptive knowledge is made from descriptions and explanations dealing with all sides of a technical object: materials it is produced from, construction, technological processes of its manufacture and operation, its mechanism and functions. This information is often formalized in the way of scientific knowledge, taking the shape of abstract notions and general principles.

"Descriptive knowledge means knowing the truth or facts, it can be assessed using the criteria of preciseness and correctness. Prescriptive knowledge is knowledge of procedures or operations; it can be assessed in the criteria of efficiency and successfulness." (Vincenti, 1984, 573)

Regulations, norms, directives and other formulas of actions to be performed at the manufacture and operation of a technical object present prescriptive knowledge. This kind of knowledge is often referred to as empirical knowledge obtained in the process of successful activity. Perhaps it is better to call it practical or “procedural” knowledge” since the term “empirical” has one more meaning denoting the level of scientific research.

"Prescriptive knowledge and implicit knowledge have a lot of common features in practice and both of these types can be called procedural knowledge". (Vincenti, 1984, 576)

Anyway, one cannot reduce prescriptive knowledge to simple skills for the reason that in the way of knowledge it implies generalizations, algorithms of actions. At the same time, descriptive knowledge serves as the basis of prescriptive one: for a person to act it is important to know the situation these actions are thought to be taken in; in other words they should be based on the description of a situation.

This strong correlation between these two kinds of knowledge covers content of any "ought-proposition", which is supposed to play regulatory role in human practical life. Let us take a norm as an example. The word "norm" implies two ideas at least. The first one is that of an arrangement or an order – actual or predictable pattern - that could be studied externally. The second is the idea of repetition, of a rule. There can be no norm without repetition. Both ideas taken together suggest acting on understanding.

Further, any explicitly articulated norm suggests two things: it specifies kind of situation that may arise (students of law call it "hypothesis") and it lays down what has to be done, whenever such situation arises (correspondingly, "disposition"). The practical force of norm can differ. Nevertheless at any case explicitly articulated norm has the general form "whenever H, then D", where "H" corresponds to descriptive knowledge. Hence,

descriptions make the foundation for prescriptions.

### 3. Information in labor structure

To distinguish the actual role of information in the structure of labor we should rely on the so-called functional conception of information developed in cybernetics, as this very approach may explain information as a precondition of purposeful activity. Essentially this conception is close to the semantic one. The difference lies in the facts that the focus is not on the content of meaningful information but on its role (function) for the adaptation of the self-regulation system to environment.

W. Ashby interprets information as recognized variety, implying divergence of some elements. The information received by a self-organized system (a subject - in our case) is contained in a message. Here the term "message" is referred to as the encoded and well ordered combination of signals in a certain manner. A recipient depending on his (her, its) ability to recognize interprets the signals. The very signals that a recipient is able to recognize and use for the coordination of his (her, its) actions comprise information.

Generally speaking to define information by the way of signal is to make circles. Signal per se is an elementary unit of information. Signal replaces something: it has meaning. In physical sense a kettle boiling on the oven and change of the temperature in the refrigerator are similar. But in the cybernetic sense these events are qualitatively different. Of course refrigerator is quite primitive as an information system. Its temperature sensor recognizes only two states of temperature,

thus indicating whether to turn on the aggregate or turn it off. What is important here is that mechanisms of recognition and control are placed inside the refrigerator. There is no difference for the kettle whether it is heating or cooling, here the process of temperature change is a human factor, for a human is the actor to make a decision to turn it off. What makes some physical process a signal is its place and role in the process of adaptation of the self organized system to the changing environment.

In the view of this interpretation, information differs from knowledge in a number of significant features. At first, signals do not need a recipient "cognitive access" to its "justification-makers" in order to function as information. The word "information" denotes a kind of an external relation of a subject that may not necessarily mold into a basic source of knowledge. Second, knowledge cannot exist without self-consciousness. This is deeply personal phenomenon. When I become aware of something, I become simultaneously aware that it is me who has become aware. This point we think underlies the truth of famous Descartes' dictum and at the same time constitutes foundation for epistemological "internalism". On the contrary, self-consciousness is not necessary condition for informational relationships.

Considering information within the interactions of self-organized system, Fuchs and Hofkirchner suggest dividing the single informational process into parts (Fuchs, Hofkirchner, 2001). Data as a result of perception form the initial material for the development of knowledge that is in its turn

necessary for the purpose of assessing and taking decisions by a subject. Thus, different information elements make different levels. At the first level, signals are received from the environment. The acquisition of a new unit that is data in other words is the act that combines perception and conceptualization of a signal. At the second level, data are interpreted. That is they acquire meaning and thereby knowledge is formed. Knowledge is a consequence of data interpretation, and this process includes experience and facts. At the third level a subject puts knowledge into the context of his objectives, gives the assessment of his knowledge based on values, norms, rules, opinions, ideas or beliefs.

This process starts in the situation when a subject is obliged to act with the purpose of problem solving. In this situation, knowledge is estimated and is provided with a meaning (sense).

Model suggested by the researchers helps to see here aspects that can distinguish informational labor from the so-called knowledge worker.

#### **4. Recognizing different kinds of labor**

A worker relying on the determined algorithm of actions does not have to conceive the information he deals with, as he is required to perform some definite prescribed operations. He deals with the available and ready information as an object of labor but he does not use it for knowledge acquisition and, correspondingly, does not create new information.

Such standardized, routine intellectual work has a lot in common with the physical routine work as there lies prescriptive knowledge in the basis of both. To achieve successful results, a worker needs only the precise and accurate fulfillment of instructions. It goes without saying, that prescriptive knowledge presents a necessary condition for standardized labor as an important algorithm of actions in order to get the foregone results. It is significant that in this case, a worker can obtain knowledge in the form of instructions and the justification of knowledge here is authoritarian. In other words, prescriptive knowledge may obtain the justification in the form of a norm, tradition, as its truthfulness is based on the result received earlier. At the same time an instruction is in fact an information itself or, to be more precise, it may be regarded in the status of information as far as it doesn't require additional justification.

A slightly different type of situation occurs in complicated intellectual work, where the product of labor and the way of getting it are not completely known. In this case, something new can come as a result of labor and these results are not always predictable. In such a situation, justification of actions is rational insofar as objective situation itself demands clear comprehending of causes and

consequences that lead to the desired state of affairs. Of course it is also possible to act by the hit-and-miss method, but in most real life situations such method may be very expensive both in material and moral sense.

Justification and confirmation of needed actions can be pragmatic in such cases but it must be somehow rational. Information for a worker of such a type is only a labor tool, instrument of knowledge acquisition and the knowledge itself is the object and the product of labor. Here a subject of a labor act sets the goals and the ways to achieve them on the base of his (her) own descriptive knowledge.

Thus analysis of labor structure requires accurate understanding of information and knowledge dialectics, as its ignorance may lead to confusion of different kinds of labor. It is no less important, that without considering this dialectics we could hardly keep up with the meaningful trends in our changing and globalizing world.

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