Modeling an organization from the Knowledge point of view

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What is an organization?

An organization can be defined as a group of people with a common purpose and some cohabiting rules. Both aspects of the definition are necessary. A group of people must define its goals, even if each member of the group has its own goals, in order to become an organization. This is congruent with Ackoff´s (1996) explanation of social systems, where both, parts and the system as a whole are purposeful.

However, the existence of a common purpose is not enough to build up an organization. The members of the organization may share some basic principles and cohabiting rules. These rules can be explicit or tacit. If there are not such rules, this is an unorganized group of people, but not an organization. A manufacturing plant, a university department or a family are examples of organizations.

What is Knowledge?

Nonaka (1995) has defined Knowledge as "justified true beliefs". Knowledge, as Nonaka explains, can be divided into tacit and explicit. Explicit knowledge can be expressed in words and numbers, so it can be easily transformed into information, but tacit knowledge (personal insights, intuitions or hunches for example) is quite far from information.

Any definition of Knowledge must point out the difference between information and Knowledge. A data is an objective measurement. Information is a group of interrelated data within a given context. Stewart (1997) has illustrated this with an example: "*Today's temperature is 21 ºC*" is a data. "*This is a cold temperature for this city in the season we are*" is information. Knowledge is the capacity of taking decisions using the available information in a real context. The capacity of answering the question "*Shall we go to the beach?*" is Knowledge.

This definition of Knowledge can be clarified using a graphical explanation: Knowledge can be seen as the intersection between information and activities. Information is all the linked data of an organization. On the other hand, activities are all the linked tasks that must be performed every day.
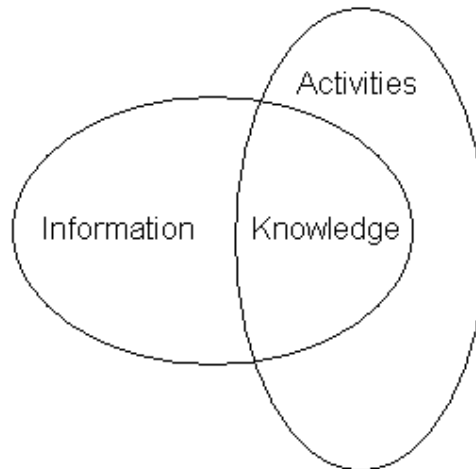
Figure 1: Graphical explanation of Knowledge

What is Knowledge Management?

We have heard many different definitions for Management. These definitions have evolved during years and each of us has accepted a particular one. As a first approach to Management, it can be set as the group of processes oriented to define goals, allocate resources, plan the utilization of these resources and measure results.

Knowledge Management consists in including Knowledge in Management. Knowledge Management must study and define the way information is brought to the activities where it is used, and the way this information is related to the activities in order to create the necessary Knowledge to perform each decisional task in a satisfactory manner.

Knowledge can not be managed as a material resource. Only the circumstances in which Knowledge is created can be managed. Resources can be allocated in order to increment the Knowledge creation, developing information diffusion networks or enabling experiences sharing workshops. But we should not forget that Knowledge can not be disseminated carrying bits of information from one point of the organization to another because it losses its tacit components.

Characteristics of Knowledge

- *Knowledge is useful*. As we have defined Knowledge, it is always useful, because it is the intersection between real activities and available information. But this usefulness does not mean truthfulness. If the information used is wrong or the activity is not correct, then the created Knowledge is not true, even if it has been used.

- *Knowledge takes part in any process*. Knowledge can not be studied as an isolated subsystem. Knowledge is created in every decision taken in each activity.

- *Knowledge is not measurable*. How can we measure tacit Knowledge if we can not express it in words and numbers? Which are the units of Knowledge? An absolute measure of Knowledge is not possible yet. It is unknown when a standardized metric will be accepted or even if it will be possible to develop such a metric.

Measuring is very helpful for Management and in many cases it is indispensable. However, the impossibility of measuring Knowledge can not be a reason to avoid managing the circumstances in which Knowledge is created.

Indicators, such as those of Intellectual Capital (Edvinsson, Malone, 1997), can make Management easier. Those indicators can constitute an indirect measure of Knowledge and are helpful in the Knowledge Management.

- *It is difficult to divide Knowledge.* Spots of Knowledge can not be seen as isolated independent areas. Some organizations have tried to identify their Knowledge classifying it in many different skills. However, it is difficult to determine whether a professional skill can not be divided into smaller ones, and whether a skill does not need another ones to become useful.

- *Knowledge losses gradually its value.* Both, activities and information, are in continuous evolution. Changes in information and activities explain the evolution of the Knowledge. If information and activities are not renewed, depreciation of Knowledge can occur. In this case, new Knowledge must be created again to perform tasks satisfyingly.

This explains the difficulties of maintenance of large amounts of data included in complex data warehouses. On the other hand, the reuse of information should make activities faster, but sometimes can avoid the opportunity of learning.

Modeling: The Knowledge point of view

The special interest of the model builder should be considered as an element of models. If we try to build a model from the Knowledge point of view, that is, including Knowledge as an intrinsic element of the system, we can use the generic structure of the Figure 2. If we use this approach we recognize to the organization its capacity to learn. This means that the organization can improve its performance based in its capacity to create Knowledge.
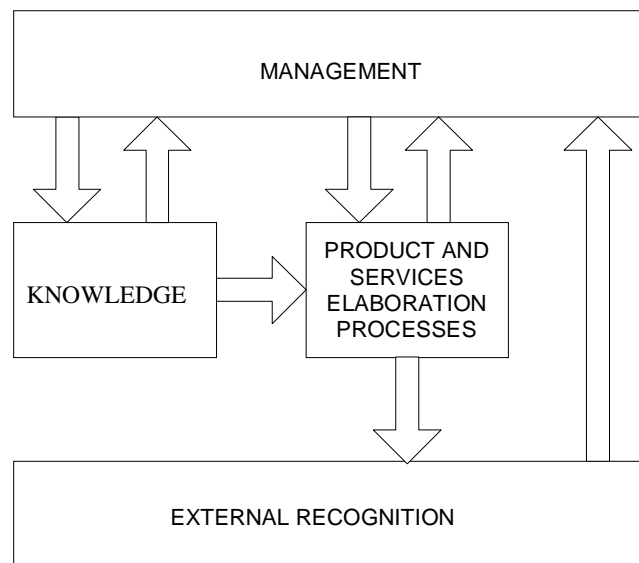

Figure 2: Organizational structure

The Management subsystem takes decisions in order to satisfy an external demand, that is, in order to achieve the best external recognition. This is a feedback loop: an organization offers its product and services and gets information back, in order to take new decisions to improve these product and services.

The first improvement to this structure is shortening delays in information channels. The Management subsystem gets information not only from the External Recognition subsystem, but also from Product and Services Elaboration Processes. This way, it is not necessary to wait for external response in order to go on improving.

The second improvement involves the identification of some auxiliary processes: the Knowledge processes. Those processes are not directly recognized by external elements, but they can be used to improve Elaboration Processes.

The last improvement would be using the information coming from the Knowledge processes in the Management subsystem in order to shortening delays. This proactive attitude should avoid the problems originated by the absence of suitable Knowledge on Elaboration Processes.

The final structure is composed by:

- *The Management subsystem*, where most important variables are related to resources: quantity, performance, etc.

- *The Elaboration Processes subsystem*, where most significant variables are those that measure the quality of those processes.

- *The External Recognition subsystem*, where customer's satisfaction appears as the main variable.

- *The Knowledge subsystem*, that will be explained in the following section.

The Knowledge subsystem: Knowledge states

Many authors have defined different Knowledge transforming or learning processes. Others have defined different Knowledge states, which are the result of the Knowledge transformation processes.

Nevis et al. (1995) have identified three stages in the learning process:

- Knowledge Acquisition: The development or creation of skills, insights and relationships.

- Knowledge Sharing: The dissemination of what has been learned.

- Knowledge utilization: The integration of learning so it is broadly available and can be generalized to new situations.

Senge and Kim (1998) have defined three Knowledge states:

- Theories: Result of the Research process.

- Methods and Tools: Result of the Capacity –building process.

- Practical Knowledge: Result of the Practice process.

In any case, each organization must define which are the states of Knowledge, which condition its behavior. Acquired, Investigated and Applied Knowledge can be suitable states for a university department or a consulting firm.

- *Acquired Knowledge* is the result of reading books, articles, papers and proceedings, hearing conferences, visiting firms, that is, the Knowledge Acquisition Process. This state of Knowledge has a big explicit component.

- *Investigated Knowledge* is the result of comparing different theoretical sources and integrating them into a holistic vision, that is, the Knowledge Investigation Process. This state of Knowledge has been integrated and criticized.

- *Applied Knowledge* is the result of developing projects in real situations, that is, the Knowledge Application Process. This state of Knowledge has more tacit components.

Each state of Knowledge has its own "value losing speed", which would be different for each organization. It is the same as saying that each state of Knowledge has its own validity time.

These state and processes of Knowledge are the key elements of the Knowledge subsystem. After having identified them, we must study their relations with the elements of other subsystems.

We can take an element of the Management subsystem: the motivation of the members of the organization, which affects their performances. Asking to each individual, we will find differences between them, but we will be able to have an approach to how does the motivation of the organization work.

Motivation is related to variables from other subsystems. Depending on the nature of the organization the weight of each factor will be different:

- External recognition of the organization increments the motivation of its members. Everybody is proud of being part of a good standing organization.

- Quality of Elaborating processes reinforces motivation. Teaching students who obtain good academic results is more motivating.

- Learning itself motivates individuals. If the organization becomes a learning space, a learning community, individuals feel the commitment to create something that they care about (Ryan, 1994). Figure 3 shows the relations between motivation and Knowledge subsystem variables.
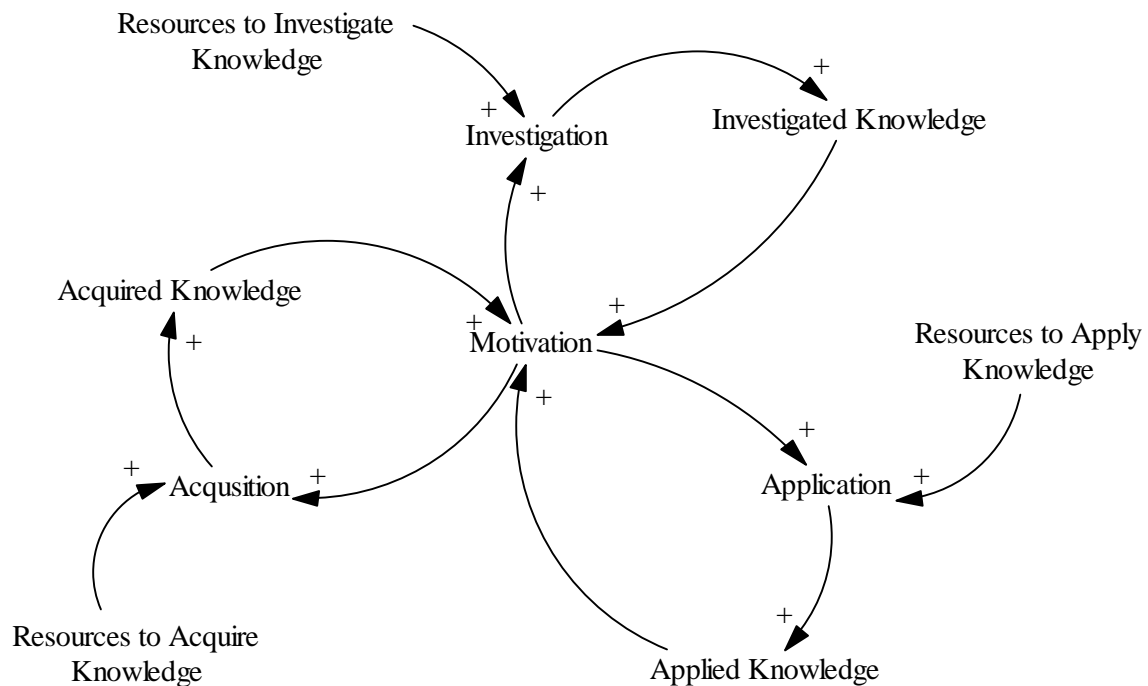

Figure 3: Overview of the Motivation causal diagram

If we want to study the relations between Knowledge and Elaboration processes we should identify the most significant Elaboration processes of the organization we are studying. The activities of an university department can be classified in three main areas: teaching, research and projects in outdoor Firms (Sarriegui et al., 1998). Other kinds of organizations, such as consulting firms would be in a similar situation, although the area of projects would become the most important.

Different processes and activities can be found in each of these areas. In the teaching area there are first and last year's teaching subjects, practical works of students, and courses for professionals. In each process the influence of different states of knowledge is not the same, so it must be established. In Figure 4 we can see relations between a teaching process and Knowledge subsystem.
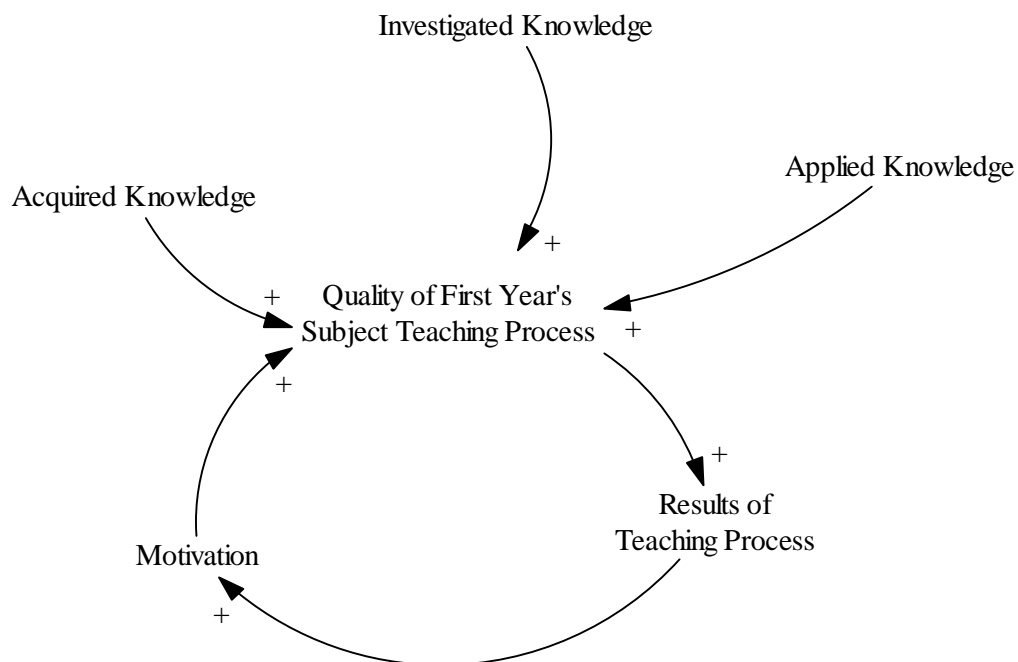

Figure 4: Overview of a Teaching Process causal diagram

Each process of the Elaboration processes subsystem is linked with External Recognition subsystem in different ways. The "market value" of the department will be highly influenced by the results of some processes, such as the "quality" of the students or the research in some particular theme. The "quality" of those students will be measured some years later, based on its professional career performance.

There is not direct relation between the Knowledge subsystem and the External Recognition subsystem. External elements only recognize the results of the Elaboration processes. However, we have already seen that we can improve these results acting on the variables of the Knowledge subsystem.

Conclusions

- Building the model of an organization from the Knowledge point of view clarifies the influence of Knowledge over its behavior. Such a model can be used to explore the interrelations between the Knowledge subsystem and the other elements of the model. The integration of Knowledge on the model of the organization would allow explaining its behavior more accurately.

- It can also be helpful in order to change the abstract idea of the organization, from a mechanistic one to a learning organism one. This new abstraction needs its own language and the identification and definition of the states of Knowledge can be suitable steps in this language building process.

- After having defined which are the states of Knowledge that can be identified into the organization the next step is the exploration of their relations with the elaboration processes, which are usually best known.

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