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PROTECTING RESOURCES TRANSFER ACROSS NETWORK MODELS

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Abstract:
In the evolution of society, irrespective of the state of war or peace, the problem of transport of resources was solved with means, techniques, and instruments in accordance with the level of economic and social development. Currently, information support for this area creates new opportunities but also risks, especially for certain categories of resources. Our research aims to find an appropriate mechanism so that the transfer of resources from one entity to another, through specific transfer channels, is achieved without significant loss. In this regard, in order to find appropriate solutions and to make some useful proposals for microeconomic management, we used the network model.

Key words: Network model, resources transfer, risks, interface, informational war, costs.

1. Introduction

We live in an universe in constant movement and transformation. Man, as part of it, tries to integrate through evolution, both at species level and at individual level.

Sometimes this integration is in contradiction with the state and evolution of the universe (often reduced to the Earth).

More and more often, we hear about the development of a sustainable (or sustainable) society, a species of development that takes into account the state and evolution of the natural environment.

Of course, the goals of sustainable development seem logical, and man should, as a species, move towards this kind of evolution. But its state and trends are not consistent with this kind of development. Currently, in our opinion, we are witnessing an undeclared war between man, species and other ecosystems on Earth. Of course, with a limited amount of resources made available by the Earth, man is trying to use as much as possible, to the detriment of the other existing species. But stocks of resources are exhausted and then there is no longer a struggle for resources with other species and it goes down to the level of human society in order to make forced transfers between different states, regions, races, sexes, age groups, etc.) until it reaches individual level! This struggle takes different forms depending on purposes, means, technical progress, etc., but the result is finally at the individual level, by restructuring the mechanism of creating and using the necessary resources.

The unprecedented amplification of each man's relationship with others through the appropriate means of the 21st century made it possible for the war to pass in a new phase, the war on the individual level.

And what can be easier (for crackers) than to act with the help of information, a resource used by all and for which individual management is very poorly developed.

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In a world of interconnections, the first class of models that is at the fingertips of the researcher to analyze and find viable responses to this war is represented by network models.

Without looking into how reality is reflected by this type of model, we mention that this type of model is accepted by society for more than 200 years with the emergence of accounting.

What is essential is that we define a few simple classes of model elements: transfer channels, flows, nodes, with which we can work in our current approach.

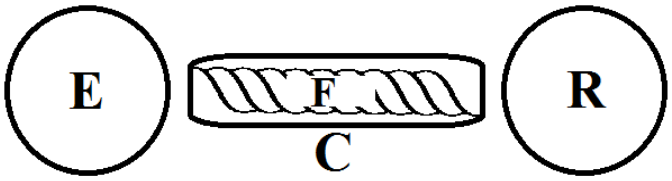
In the first instance, in this type of model, the node represents precisely the individual who is at the center of this current war (first of all, information war).

On the second place is the transmission channel, an artifact created by man to connect with others and which currently plays a very important role in influencing the "informational" man.

The purpose of each entity's actions is to transfer matter, energy or information to available channels. The purpose of the current war is to change the level and quality of the transfer flows between the transmitter node and the receiving node, so that differences are recorded in the attacker's favor.

2. Formatting crackers intervention in the network model

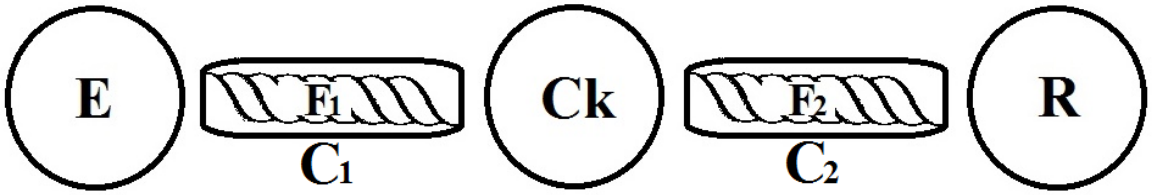
Let’s starts from a traditional pattern, as can be seen below.



where:

- E - issuing node
- R - receiver node
- C - transfer channel
- F - material flow, energy and / or information

The following model is reached:



where:

- C_1 - transfer channel directly linked to the issuing node
- C_2 - transfer channel directly linked to the receiver node
- F_1 - the flux of matter, energy and / or information sent in the circuit by the issuing node
- F_2 - the flux of matter, energy and / or information received by the receiver node
- C_k - cracker

In this case, the following changes occur:

- C turns into $C_1 + C_2$

C_1 must be the same as C_2 for to appear that the streams coming on this channel come from the transmitter node.

- F turns into $F_1 + F_2$

There must be the relationship F1>F2, the difference being the gain for cracker

In this situation, the network becomes more complex, the number of channels and streams increases, and it appear a new set of nodes (crackers)

A major role in this case should be the emitting node that should control whether the stream sent to the receiver actually reaches the destination. For this purpose, complex procedures should be developed to verify the transfer channel, the concrete connections with the receiver node and to increase the forms of insurance (measures to counteract potential losses on the channel). There are currently many procedures, protocols, means, techniques that try to minimize crash activity at the network level, but at the node level, the measures are only in the sphere of information viruses (not for "energy antiviruses" or "material antiviruses"!).

In this regard, we propose, in the network model, the introduction of the interface concept to help the struggle for conservation (the ultimate goal is to conserve transferred streams from the transmitter to the receiving node).

3. The concept of interface - control tool at network node level

Any input or output is first seen through the interface of the node with its environment, an interface that has a similar role to the cell membrane.

In this context, this "membrane" represents all the means, tools, techniques, mechanisms and procedures by which the entity can make a (controlled) transfer of material, labor, energy and information to the environment.

Any "membrane" defined in this way must be sufficiently permeable to be able to exchange with the environment, but only within certain limits.

This includes:

- a flow transfer
- transfer channel
- internal receiver as part of the interface (membrane)
- the receiving entity, which has direct connection with the transfer channel (external receiver)
- an internal receiver as part of the interface (membrane) of the issuing entity, which is directly related to the nod's internal environment (internal receiver)
- a transmitter that is also part of the transmitting entity (membrane) interface that is directly connected to the transfer channel (external transmitter)
- a transmitter that is also part of the interface (membrane) of the transmitting entity, and which is related to the entity's internal organization.

The transfer flow is carried out continuously or periodically as well as with some amplitude. The transfer channel can be potential or active, its activation is accomplished when one of the two ends of the channel emits a stream and at the other end an interface receives the flow (material, energy, informational).

Permeability is the fundamental property of the interface that allows transmission from the transmission channel to the entity's internal environment.

It is obvious that for closed systems, the permeability is zero, but can we say that the open system or the network tend towards maximum permeability? We think not, because the interface depends on its organization and functioning and does not allow maximum permeability.

We have two extreme cases, if permeability is maximal:

- The entity (node) would end up being the same as the emitting entities (it would produce an absorption of the receiver node by the emitting node);
- It destroys the internal structure of the receiver node that eventually disappears.

In both cases, there is no resource transfer and the node disappears.

In general, permeability P can be expressed as:

$$Pm = f(\sum Ft, \sum Fi, N, O, G)$$

where:

- $\sum Ft$ –the costs for accepting streams with a certain transfer frequency
- ΣFi - the costs for accepting flows of a certain level
- N - the "technology" cost for building appropriate interface architecture
- A - the cost to ensure a predefined organization level of the interface
- G - cost to ensure adequate flow absorption capacity in the entity's internal environment.

It is very important for the survival of the entity's internal structure that the interface allows a transfer so as to ensure the operation of the parameters set in accordance with the strategy, plans and tactics adopted at the node level.

Shocks may occur when:

- The transfer stream exceeds the channel capacity and then the transfer jams can be transformed into shock to the issuer;
- The transfer stream exceeds the capacity of the receiving nod;
- The transfer stream changes or is disabled during the transfer because the issuer or channel undergoes major changes.
- The transfer stream is blocked inside the interface, although the node's internal environment recognizes the utility of this flow.
- The transfer stream passes through the interface and locks into the internal environment of the node.

From a node point of view, shocks occur when flows exceed certain preset transfer limits and have an impact on their internal organization

It should be noted that the internal organization of the node must be viewed in two ways:

- Internal organization, in general,
- Internal organization of the interface.

We usually refer to the fact that an interface is organized in a certain way; it includes material goods, relationships, actions, processes, mechanisms and is more or less visible depending on the size of the interface and / or the entity (the node).

In this vision, shocks that appear on the transmission channel or the interface can be transferred to the internal environment of the entity (node) or may be interrupted in the interface and it is a change in the organization of the interface or a change in the internal organization of the interface if the shock goes beyond the interface.

The transfer of a shock through all of these stages - the transmitter, the transmission channel, the node's initial receiver, the interface, the transfer to the internal environment of the node and the change of organizational status leads to a certain erosion of the "shock" (quality of shock).

This erosion that occurs over a period of time may be beneficial to the receiving entity in the appropriate adjustment direction.

The interface design and operation pattern differs greatly from one entity to another. In a way, the interface can be structured in the case of economic agents, otherwise at the level of the individual. However, in the current context, when the focus is on the physical person there are a multitude of problems, mainly related to costs: spending to achieve a proper environment interface and insurance costs. But who does these costs? Each node

(individual) should bear these costs. But the material conditions for this are not yet created across the entire network. Then part of these "tasks" is taken over by nodes specializing in the "protection" of the network as a whole. It is enough? On this question is difficult to answer, but in the future, we believe that if the war is to an individual level, then the problem of "endowment" should also be placed on the individual level!

4. Conclusion

This paper attempted to present some views on how certain specific concepts of dynamic approach of the entity (node) can modify at the methodological or structural level the models used to describe the social and / or economic reality. One of the biggest obstacles reported by many authors is the requirement to gather a large amount of data to characterize society, the economy, the environment. The use of these data is often hampered by the lack of adequate measurement tools for dynamic variables, excessive prolongation of research duration, the reactions that may occur, in some cases subjects repeat a load request a number of times (low motivation or fatigue, abandonment).

Our research is at first but we believe that efforts in recent years to integrate the concept of interface into current theory and practice will lead to a correct management of the nodes (individuals) in an unpredictable future.

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