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REFLECTIONS ON INTERACTIONS IN SYSTEMS

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1 | Abstract
There are two ways the interactions of the elements, or parts, of a system are important. First, interactions are a basic part of the definition of a system. This chapter discusses the many roles that interactions may play in the system. Among these roles is a mechanism for the system to achieve its role as a system, namely its purpose, which is the objective of the entire system and is more than the sum of the objectives of the individual parts. Second, other roles include the ability of the elements to achieve synergy among the various other elements. This synergy serves to enable the system to achieve the level of holism needed to qualify as a true system.

2 | Keywords
system, elements, interactions, synergy, holism

3 | Introduction and Interactions in Systems
First, interactions play an important role in the production of emergent properties. Interactions are normally considered to be the touching of two physical parts of the system. a system is defined to include multiple parts, the interaction among those parts, and the emergent property of the system, namely the achievement of a purpose, Hence, the interactions serve, in the first instance, as a mechanism for the system to achieve its ultimate purpose as a system. This definition of system is articulated by (*Dori et al., 2019*) and (*Checkland, 1999*) Although Checkland does not mention interactions in his definition, he does emphasize the importance of emergent properties, which he implies cannot be achieved without interaction.

4 | Types of Elements
Another logical question is what sort of elements constitute the whole and are interconnected. They can be ant sort of physical objects, or they can be abstract objects. For example, they can be chemical objects. This is especially true for the elements related to holism as described below. In the case of chemical elements, they can interact with each other chemically as in the case of sodium and chlorine. When they interact with each other they become sodium chloride, that is, common salt. On this case the resulting chemical sodium chloride has a well-known emergent property, namely, the taste of salt.

The physical element can also be a biological element, such as a vegetable.

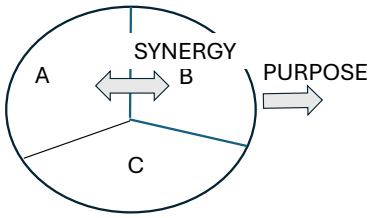
Finally, the physical element can be a metal, such as aluminum. Hence, chemicals, biological elements, and metals are three typical elements that can interact with each other. When they interact, this interaction is called synergy because the interaction is mutually effective to all elements.

5 | Interactions in Holistic Systems
Another role of interactions is as a mechanism to assure the materialistic view of holism of the system. This section is an elaboration and reinforcement of the concepts related to holism. This section discusses the entire system and its properties related to holism. Holism can also be described as a property possessed by all systems.

Materialistic holism is the description of a system in which the elements perform in synergy with one another so that the behavior of each is critically shaped and informed by its relation to the whole. Thus, the essence of holism is the method by which the parts relate to the whole as described by (*Mobus & Karton, 2015, p. 11*).

The three elements described above when interacting execute holism because of the synergy between the elements. This description of holism can be described as a materialistic description. There is also an abstract description in which all the elements are abstract. This concept is illustrated in Exhibit 1.

Exhibit 1. Holism with Synergy



6 | Conclusions

This paper has shown that although interactions are not a frequently discussed aspect of systems, it is seen that interactions perform two important roles, first as a basic feature of systems and secondly as as an enabler of holism, especially with respect to materialistic holism.

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7 | References

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