System Management, Organizations, Systems. General Management Challenges

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Systematic Management

(Rebekiah Hill, 2015)

Systematic management is an approach to management that focuses on the management process rather than on the final outcome. The goals to this approach to management were:

- To create specific processes and procedures to be used in job task completion.
- To ensure that organizational operations were economical.
- To ensure that staffing was adequate for the needs of the organization.
- To maintain suitable inventory so that the demands of consumers could be met.
- To establish organizational controls.

Systematic Management

- Planning and experience
- Dialectical relation of tension between plan and reality
- Practical real-world development and *practice of thinking*

World and Reality

World is *reality for us* and thus reality in the process of conceptual grasping.

Organization

Formal Organization (Wikipedia)

An organization that is established as a *means for achieving defined objectives* has been referred to as a formal organization.

Its design specifies how *goals are subdivided and reflected* in subdivisions of the organization. Divisions, departments, sections, positions, jobs, and tasks make up this work structure.

Thus, the formal organization is expected to *behave impersonally* in regard to relationships with clients or with its members. [...]

A *bureaucratic structure* forms the basis for the appointment of heads or chiefs of administrative subdivisions in the organization and endows them with the authority attached to their position. (my emphasis)

Organization

Informal Organization (Wikipedia)

[...] The informal organization expresses the personal objectives and goals of the individual membership.
Their objectives and goals may or may not coincide with those of the formal organization. [...]

Organization

The ORG Ontology

`org:OrganizationalUnit`, `org:FormalOrganization` and `org:OrganizationalCollaboration` as subconcepts of the concept `org:Organization`.

Organization

... represents a collection of people organized together into a community or other social, commercial or political structure.

The group has some common purpose or reason for existence which goes beyond the set of people belonging to it and can act as an Agent.

Organizations are often decomposable into hierarchical structures.

Organization

`org:Organization` is related to `foaf:Agent`

... the class of agents; things that do stuff. A well known sub-class is `foaf:Person`, representing people. Other kinds of agents include `foaf:Organization` and `foaf:Group`.

A `foaf:Group`

... represents a collection of individual agents (and may itself play the role of a Agent, i.e. something that can perform actions).

This concept is intentionally quite broad, covering informal and ad-hoc groups, long-lived communities, organizational groups within a workplace, etc. ...

Organization

While a Group has the characteristics of a Agent, it is also associated with a number of other Agents (typically people) who constitute the Group, its members. ... The basic mechanism for saying that someone is to use the member property of the Group to indicate the agents that are members of the group.

The terms Agent and Group thus introduce self-similar concepts of structures that are *capable of action*. This corresponds to the legal construction of a *juridical subject* in the sense of the Civil Code (BGB) if *responsibility for the consequences of action* is added.

Organization as Socio-Technical Systems

This corresponds closely with the *system concept in TRIZ*:

A system (lat. greek "system", "composed", a whole consisting of parts; connection) is a set of elements that are interconnected and interact with each other, forming a unified whole that possesses properties that are not already contained in the constituent elements considered individually. (Petrov, 2020)

Organization as Socio-Technical Systems

A *system* is a set of elements that are in relationship and connection with each other and that constitute a well defined unity, an integrity.

The necessity of the use of the term "system" occurs when it is required to emphasize that something is large, complex, immediately not wholly comprehensible, but at the same time a unified whole.

Unlike the notions "set" or "aggregate", the concept of a system emphasizes the ordering, the integrity, the regularity of construction, functioning and development. (TRIZ Ontology Project)

Organization as Socio-Technical Systems

Ian Sommerville *Software Engineering* also starts with the concept of a system and moves from there to the concept of *organization*.

System

A system is a meaningful set of interconnected components that work together to achieve a specific goal.

Organization as Socio-Technical Systems

Technical computer-based systems

... are systems that contain hardware and software components, but not procedures and processes. ... Individuals and organizations use technical systems for specific purposes, but knowledge of that purpose is not part of the system.

For example, the word processor I use does not know that I am using it to write a book.

Organization as Socio-Technical Systems

Socio-technical systems

... contain one or more technical systems, but beyond that – and this is crucial – the knowledge of how the system should be used to achieve a broader purpose.

This means that these systems have *defined work processes*, *human operators* as integral part of the system, are *governed by organizational policies* and are *affected by external constraints* such as national laws and regulations.

Essential Characteristics of Socio-Technical Systems

- They have special properties that affect the system as a whole, and are not related to individual parts of the system. These special properties depend on the system components and the relationships between them. Because of this complexity, the system-specific properties can only be evaluated when the system is composed.
- They are often not deterministic. The behaviour of the system depends on the human operators and on other people who do not always react in the same way. Also, the operation of the system can change the system itself.

Essential Characteristics of Socio-Technical Systems

- The extent to which the system supports organizational goals depends not only on the system itself. It also depends on the *stability of the goals*, the relationships and *conflicts between organizational goals*, and how people in the organization *interpret those goals*.

In this context, there is a clear shift on the scale of controllability to movement according to intrinsic laws, which in **socio-economic systems** with a large number of stakeholders or even **socio-ecological systems** shifts further in the direction of movement according to intrinsic laws ("natural processes").

Technical Systems

The concept of a technical system in a planning and real-world context is four times overloaded:

1. as a real-world unique specimen (e.g. as a product, even if the unique specimen is a service),
2. as a description of this real-world unique specimen (e.g. in the form of a special product configuration)

and for components produced in larger quantities also

3. as description of the design of the system template (product design) and
4. as description and operation of the delivery and operating structures of the real-world unique specimen systems produced from this template (as plans of production, quality assurance, delivery, operation and maintenance).

Technical Systems

The (more general) concept of a system in such a concept has the epistemic function of (functional) ≪reduction to the essential≫. This reduction takes place in the following three dimensions

(1) External demarcation of the system against an environment, reduction of these relationships to input/output relations and guaranteed throughput.
(2) Internal demarcation of the system by combining subareas as components, whose functioning is reduced to a ≪behavioral control≫ via input/output relations.
(3) Reduction of the relations in the system itself to ≪causally significant≫ relationships.

Technical Systems

It is further stated there that such a reductive description service rests on preexisting (explicit or implicit) description services in three dimensions:

(1) An at least vague idea about the (working) input/output services of the environment.
(2) A clear idea of the inner function of the components (beyond the pure specification).
(3) An at least vague idea about causalities in the system itself, i.e. one that precedes the detailed modeling, an already existing idea of causality in the given context.

Systems and Resources

One final thought, not yet elaborated: the lofty approach at the beginning of this presentation, that it is more about „the management processes rather than the final outcome", is of course only half the truth (a well-known sentence of a former Chancellor). When it comes to *reliability* in collaboration, the specification-compliant outcome of a system (as a black box) is in the foreground, and the way how this was achieved is minor important.

In a network of systems where one relies on the other, this form of reliability plays a major role, since a prerequisite for a system to function in accordance with its specification is not only its internal organisation, but also that the system's operating conditions are met, which manifests itself as structured access to the resources required for the work in the form of a specific throughput of material, energy and information.