Sehr geehrte Damen und Herren!

Am

23. Juli 2021, 10-16 Uhr

findet online im BBB-Raum BIS.SIM https://meet.uni-leipzig.de/b/gra-w2c-fhz-qnp die 18. Auflage unseres

Interdisziplinären Gesprächs

statt, mit der wir eine alte akademische Tradition aufnehmen und den fächerübergreifenden Aus-tausch zu philosophischen und gesellschaftlichen Aspekten moderner Technologie-Entwicklungen pflegen wollen. Als Schwerpunkt des aktuellen Gesprächs haben wir den Titel

Systems, Processes, and their Management

gewählt. Bitte beachten Sie, dass das Gespräch mit Blick auf internationale Teilnehmer wiederum **in Englisch** stattfinden wird.

Announcement

The 20th century is the century of development of the industrial mode of production. This develop-ment is characterised by

- the development of the means – of the technical principles that can be used in production,
- a huge unfolding of production-organisational interdependencies.

Systemic concepts are applied to cope with the increasing complexity of the processual interwea-ving of this totality: Processually closely related elements are combined into a *system* whose dyna-mics is still amenable to description. The "outside" of that system is significant in two ways,

- as source of a throughput that triggers the system's internal structures,
- as target of the system's purpose in the overall context.

In a systemic world, however, that "outside" is nothing else than the totality of all other systems. System formation therefore means to decompose the processual complexity of the totality into, on the one hand, systemic processes *within* a context and, on the other hand, coupling processes *between* such systems. In this sense, the concept of system is central for us to grasp both the descriptive and the real-world structuring processes of modern productive contexts.

Applying practical design on a systemic basis, the systemic thought materialises in reality – in the advancement of a systemically reflected reality, forms of movement emerge and institutionalise, which follow systemic delimitation and control and thus lead to a co-evolution of such forms of reflection and forms of practice. This is not an invention of humans, but the essential core of many "natural" large-scale biological, population-dynamic and social processes, from the "formative" influence of an anthill in the forest on its environment to socio-economic, socio-ecological and socio-cultural processes.

With the unfolding of the industrial mode of production, this systemic structure also unfolds and changes. With the replacement of (old) private procedural skills by the application of (new) technical principles, the focus of the industrial mode of production shifts in a first phase towards increasing importance of systemic production-organisational forms of *description* that can be realised with workers who are easy to "train". The clock rate of the production-organisational description determines the clock rate of this form of cooperative action, particularly impressive with the introduction of the conveyor line.

However, this is only half the story, because the productively effective preparation of technical principles as technical means can in turn be conceived as a systemic process that aims to encapsulate the active principle in a component as a black box whose procedural use is reduced to the operation of a corresponding interface. Thus the carrier of processual knowledge required in the (comprehensively understood) production process is split further: alongside the semi-skilled worker we find the engineer's mastery of the technical principle. The latter skills are required less in production itself than in the design, preparation and maintenance of production, and thus belong to a system in which the system of (immediate) productive labour is embedded. The same applies to the production-organisational work of the manager. The unfolding of the industrial society is thus also linked to the unfolding and differentiation of *professional profiles*. While Marx in the second half of the 19th century still makes a clear distinction between bourgeois and proletarian, this differentiation leads above all to a differentiation on the side of the proletarians, into *blue collars* and *white collars*.

Systemic approaches are confronted with the dialectical contradiction of unity and diversity. Technical principles are different *unities* obtained from a diversity of sources of experience through a special process of abstraction. The causalities within such a unity of a technical principle are represented in a scientifically based conceptual system that has to be acquainted to develop the required private processual skills of a professional in that technical area. Technical principles can be applied in a variety of real-world situations thus reproducing diversity from unities. The reproduction of this socially available processual knowledge takes place systemically in the training of professionals, the application in practice and the socio-political activity of professional associations of a variety of engineering profiles. Conversely, production-organisational contexts are characterised by the interplay of *several* technical principles. Hence the recovery of diversity from these unities is a difficult process of combination of appropriate principles (available as components) into productive units as "special wholes", i.e. systems.

Such a design of systems from components is driven by many competing aspects. Szyperski shows in his book *Component Software* (Addison Wesley 2002, ch. 8) how such different analysis concerns influence the practical design of software components and thus directly the real-world processes in which these software components are used. Differently prioritised requirements such as analysability, extensibility, maintainability, fault tolerance, bug containment, combinability, and separate compilability result in differently designed systems and realise differently tailored real-world dynamics, each with its own advantages and disadvantages.

With the unfolding of the industrial society, demands on the *management* of such processes are also changing. In 1911, F. Taylor was still in favour of strengthening the role of production-organisational descriptions that are simply rolled out in the medium of workers. This further develops in the introduction of assembly line systems and the management of largely unskilled and semi-skilled workers in a factory which is imagined to work like a machine. In most management theories the terms *management*, *leadership* and *personnel management* are largely used synonymously. But management requires process-planning and process-analytical skills as well as skills in personnel management. *Management as a systemic function* is – at least on this theoretical level – tied to the manager as an individual leader. There is little focus on the relationship to top technical personnel and other employees with specific knowledge about the technical principles.

However, with forms of cooperative action in multi-stakeholder contexts relationships are coming into the focus, where more deeply layered processual knowledge from different areas must be brought together and other forms of management as a systemic function are required.

In our interdisciplinary discussion we want to further explore this field of development and tension.

Participation in our discussion is free of charge, but a **registration** with graebe@informatik.uni-leipzig.de is required.

More at

http://mint-leipzig.de/2021-07-23.html

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