Management Engineering

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Abstract:
This lecture-tutorial introduces to the evolution up to now of urban planning theories-in-practice. It aims at highlighting the plural and evolving streams of knowledge which form the core of planning 'knowledge-in-action'. It introduces to the wicked problems and the dilemmas of planning with particular attention to the cognitive 'more-than-rational' approach which is emerging based on the many different planning paradigms of one century and half of planning theory and practice. The lecture-tutorial is structured in five parts: three of these parts deal with the three major approaches to planning still influential in the work of planners, the fourth part deals with a hybrid approach providing an integrated keystone to the development of planning, the fifth and final part considers spatial implications of management engineering.

The behavioral-systemic approach: it considers management engineering as a problem solving activity, in which system theory and analysis and the leading of complex systems by cybernetics play a fundamental role; human behaviors and decisions can be analyzed, modeled, and optimized as it is for any other problems by using a scientific approach, engineering and policy science are close friends in this venture. Gradually, a less optimistic and confident attitude enters the scene, acknowledging the limitations which affect our rationality and knowledge of the world.
The humanistic approach: based on pioneer studies, in the fields of psychology and organizational science among others (see the experiment in the General Electric plant at Hawthorne by scholars from the School of Business of Harvard in the 1930s, or the start of the Laboratory of Group Dynamics at Bethel, Usa, in the 1940s), the crucial role of typically human abilities (emotion, creativity, trust, etc.), not easily transferable to machines or rational devices, is acknowledged, it becomes also clear that top managers in their work do not follow the rigid scheme and path of production organizations postulated by Taylor, on the contrary adopting shortcuts and euristics which consist of tacit knowledge and accumulation of high level experience, something that evokes art abilities.
The cognitive approach: agent-based approaches are developed for analyzing, modeling, and managing increasingly multifaceted and decentralized organizations; the idea is that mastering individual and social cognition is fundamental prerequisite of efficient and effective organization management and engineering; the cognitive approach is introducing a new landscape of concepts (see ontologies in agent-based intelligent systems and organizations) and methods (see the new various cognitive models).

The technological change and organizational approach: some relevant factors are changing the way in which techniques and technologies are conceived and practiced, among them the search for environmental sustainability of techniques, globalization of societies and economies, and the cognitive turn in science and organization in any field and at any level; technology is not seen any more as developing in linear forms in time or according to progressive and hierarchical models on the terrain of efficiency and effectiveness, dilemmas of the relation between traditional

(endogenous) techniques and non-traditional (exogenous) techniques become more clear, the life-cycle assessment of technological change and technological obsolescence enters the scene with its charge of unsolvable problems; the role of individual and social cognition, of 'technological memory' in technological change and technology organization is increasingly acknowledged; information and communication technology is tremendously developing and introducing new cognitive and behavioral equilibria in individual and social organizations throughout the planet. Spatial implications of management engineering: with the increasing dematerialization and knowledge enrichment of techniques, technology acquires new spatial profiles, for instance in terms of production landscape, individual and social knowledge dynamics, spatial distribution and interaction of social and human capitals, so that cities and regions are gradually changing from the hierarchies and polarities of the past to the nets of the present.

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