

Editorial

The interdisciplinary generalist

“The group contained a wide scatter of scientific backgrounds and interests, and each member contributed a memorable personality to the mix.” (Miser [1, p. 633])

1. An old virtue of OR/MS

Being interdisciplinary is an old virtue of OR/MS—but often forgotten [2, p. 83f.]. The rationality behind the necessity of an interdisciplinary approach to problems is simply that problems in general are not ordered according to the scientific disciplines; instead, most real problems (at least the major and more complex ones) have at the same time physical, chemical, technical, economic, legal, social, ethical aspects etc., or as Ackoff [3, p. 667] put it: “Disciplines are categories that facilitate filing the content of science. They are nothing more than filing categories. Nature is not organized the way our knowledge of it is. Furthermore, the body of scientific knowledge can, and has been, organized in different ways. No one way has ontological priority.”

Therefore, problem solving requires the cooperation of individuals with a “wide scatter of scientific backgrounds and interests” such as Miser (above) characterized his first interdisciplinary team. Interdisciplinary teams have to be conducted—ideally—by an interdisciplinary generalist.

2. Facets of interdisciplinarity

Such a generalist should (i) be familiar with the basic content of the single disciplines, (ii) be able to apply his/her knowledge and (iii) have some *passion* for the disciplines, such as (based on [4]):

From mathematics: Ease with symbolic abstraction and familiarity with mathematical structures of

cause–effect as well as means–end networks. The ability to design mathematical models of reality and to draw insight into the reality through the results of mathematical manipulations of the model. Delight with abstraction and value-free logic.

From the sciences: Knowledge of the static states and the dynamic processes of the living and the inanimate nature. The ability and the will to apply this knowledge to technical realisations. Respect for creation; admiration of nature in its eternal harmony.

From engineering: Knowledge of technological laws and understanding of technical processes. The ability to design, shape and evaluate technical systems. Pleasure with design activities and functionality; admiration for technical masterpieces.

From computer science: Familiarity with programming languages and practical experience with information technology. The capability to design information systems. Fascination by the division of intelligence between man and computer—as well as their cooperation.

From economics: Familiarity with economic theories and—based upon the theories—insight into economic realities. The ability to analyse and interpret economic structures and processes. Pleasure to take responsibility for economic action.

From business administration: Knowledge of structures of and processes within as well as between enterprises and micro-economic institutions. The qualification to understand the micro-economic structures and processes as well as to design and operate man–machine systems. Delight to play a responsible role within a micro-economic institution.

From the social sciences: Knowledge of sociological theories and understanding of social structures and processes. Acceptance of the value load of any human information processing; consciousness of the manifold criteria of judgement of social systems. Enthusiasm to

cooperate with other people and willingness for responsible leadership.

From judicature: Knowledge of the legal system and the judicial processes. The aptitude to judge structures and processes from the legal point of view. Satisfaction with finding decisions within the legal limits.

From the fine arts: Sensitivity for harmony and tension, aesthetics and beauty. The talent to integrate aesthetic aspects in processes of judgement. Satisfaction with aesthetic beauty.

From philosophy: Foundations for insight how and why which powers, ideals, values, and convictions hold the world together. Sensitivity for the interdependence between causality, finality, ethics, and aesthetics. Pleasure in studying the roots of philosophy.

3. The generalist

The generalist—described above—is only the ideal of an interdisciplinary OR/MS professional. Nobody will ever reach this end in perfection. The way to this end is the end.

Nobody shall be judged on the basis of his/her distance to the end; instead, he/she should be judged on the basis of his/her endeavour.

References

- [1] Miser HJ. Craft in operations research. *Operations Research* 1992;40(4):633–9.
- [2] Müller-Merbach H. Interdisciplinarity in operational research—in the past and in the future. *Journal of the Operational Research Society* 1984;35(2):83–9.
- [3] Ackoff RL. Science in the systems age: beyond IE, OR, and MS. *Operations Research* 1973;21(3):661–71.
- [4] Müller-Merbach H. Der Wirtschaftsingenieur als Generalist. *Der Technologie-Manager* 1986;35(2):48.

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