

scale for development of an interpretive structural model.

This monograph presents a method whereby the computer can carry out the necessary operations for those interpretive structural models that can be put in correspondence with digraphs. Since the monograph is largely limited to such models, it does not encompass all possible kinds of interpretive structural models.

It is easy both to underestimate and to overestimate the significance of the capability that can be developed from the theory presented in this monograph. Since the structuring of systems has largely been done in an ad hoc way, in the past, it may seem that a theory designed to permit this process to become much more explicit, and to be carried out with machine assistance, would be superfluous. Now, the author believes very strongly that such a view would greatly underestimate the significance of the theory presented in this monograph. Three thoughts seem especially relevant. First, when the number of elements to be considered is large, the number of interactions to be considered is at least comparable to the square of the number of elements. The logistics of dealing with so many interactions is by itself an inhibiting factor in conducting a studied structuring exercise and in manipulating the perceived relations. Second, in the absence of assistance in developing this information, it seems likely that the most fundamental thinking that goes into model development will be lost, and with it considerable capacity to communicate to other material that maybe of much importance in establishing credibility of a model. Third, if at the time the structure of a model is being developed it becomes feasible for the developer to concentrate primarily upon the substantive rather than the logistical aspects of model development, it should be much easier for model structuring to become a group activity. Thereby at a variety of people, could become involved in model development and evolution. It is easy to imagine that several groups construct a structural model based on the same element set, and that in comparisons of differences among these models, significant insight might be gained into differing perceptions. These might, in turn, lead to superior structuring from a conglomeration of views. Alternatively, structuring alone might induce redefinition of the matters being considered, and alter the course of future events in useful way.

The author believes that there will be applications wherein the structural model is a desirable end in itself, and other applications wherein the structural model will be an intermediate step in the development of more sophisticated types of

models. It will not always be easy to decide in a particular situation what will follow the development of a structural model. There is probably a danger that the mere construction of a structural model will be thought to be a very desirable end in situations where the greatest value from the development would be dependent upon considerable follow-on activity. In such instances, it is easy to overestimate the benefits that could flow from use of the theory developed herein.

Some of the content of Chapter 3 is intended to add more detail to illustrate the foregoing comments on significance of structural modeling.

This monograph is written, necessarily, for the reader who has or will acquire a grasp of the elementary parts of set theory, matrix theory, mathematical logic, and graph theory. In only a few spots is additional mathematical sophistication called upon, and in those instances references are provided. Thus this monograph is addressed primarily to those in a position to place this work in the service of non-mathematicians.

It is hoped later to make available a non-mathematical monograph that will illustrate a variety of applications of structural models in various fields. This later monograph would be addressed primarily to potential users who are not mathematicians.

The Summary explains how the chapters are organized and can be read to gain a rough overview of the monograph. An abstract appears at the beginning of each chapter.

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