

CHAPTER 13

DESIGN RULES FOR ORGANIZATION SUBSTRUCTURE PROPERTIES AND COMPONENTS: PART B

1. Design Rules for Flexibility of a Structure Performance

An organization structure is more or less flexible according to the number of performances that meet some given conditions and so defines a set. First, a performance in the set meets some predetermined level of optimality for some circumstance which the structure may realistically encounter. Second, each performance is implementable within some finite length of time, measured from the time the performance is chosen to the time it is actually done. Both the level of optimality and the length of time for implementation are chosen within the context of the overall nature of the states of the environment and states of technology that be may encountered. For any given pair of optimality levels and length of time, there is a set of performances that meets them. This set may be used to create another set, that of circumstances, each of which is one for which a performance in the first set meets the optimality conditions. If the number of circumstances in this set is to be made larger, then the number of performances in the other set must be increased, or at least remain the same. In other words, increasing the number of performances in this set may increase and will never decrease the number of circumstances in the other set. Once the level of optimality and time period are set, then it follows that a structure that is to increase its flexibility must increase the number of performances that meet the conditions. A set of performances, each of which meets the optimality condition for one or more circumstances and the time limit for implementation, is the set we may term “arrows in the quiver”. We may measure flexibility by the number of performances in this set. Flexibility measures the number of performances which are implementable within a given time period and which are of some minimum quality level for some circumstances. Along with each such set, there is a set of circumstances that are covered, so to speak, by at

least one performance that is at least of the optimality level specified and can be implemented in the specified time.

For the flexibility measure, the optimality level is for performances held in reserve. This means that they are there to help direct the search for the performance in the set that meets the level of optimality for actual implementation. What we have is a set of performances, each of which is described in some level of detail and marked as the starting point for identifying the performance that meets the required level of optimality and is to be implemented within some fixed time period. The more detail in the definition of the performance, the shorter the time to complete the detail required and implement that performance. The fewer the number of circumstances identified as that for which a performance is marked to be used to start the process of deriving the performance that meets the required level of optimality, the shorter the time it takes to make the derivation. The higher the level of optimality required in the implemented performance, the longer the time it takes to make the derivation. When these two are set, then the number of performances that are in the set that meet them defines the level of property of its performance we call flexibility. Over time, a structure that learns is one which uses its experience to increase the detail of the performances in the set, reduce that number of circumstances for which the performance is the search starter, and reduce the time of deriving the performance that meets the optimality level for implementation.

Before we go into the learning structures, we work with the case where no learning occurs. The starting set that meets our conditions is considered to be that which remains unchanged unless it is changed into another that becomes the fixed set of performances that meet the two conditions. This is the set of reserve performances, so to speak, available for use as is or as bases for generating ones that are. They are arrows in the quiver, one of which is to be drawn and used as is, or modified and then used given the game sighted. The optimality of the performances so held in reserve need not be as high as that needed for actual use. It is more costly to make them all meet the higher condition. The time it takes to get one that does meet the conditions of optimality is shorter than that needed if there were none there, and we had to start from scratch.

To be in the set that makes for flexibility, a performance must meet conditions for some set of circumstances. Suppose a structure starts with such a set and one implemented performance. Each such