Information and Management Sciences
Volume 2, Number 1, pp.95-118, 1991

Dynamics of Information in Distributed Decision Systems

James K. Ho
University of Illionis at Chicago
U.S.A.

Tak C. Lee
Florida Atlantic University
U.S.A.

Abstract

This paper considers distributed decision systems exemplified by subdivisions competing for corporate resources. Corporate coordinators oversee the otherwise independent activities of the subdivisions by setting prices (or premiums) on the resources. Taking such prices into account, sub divisional planners submit proposals which will be weighed by the coordinators who then may adjust the prices. If equilibrium prices can be established, an optimal allocation of the resources will be made by the coordinators. The behavior of this decision process is greatly affected by the manner in which information is communicated among the parties involved. We discuss four classes of information schemes and study the dynamics of information involved. It is shown that the overall effectiveness of any scheme depends on behavioral patterns of the interacting agents and that no single scheme can be universally superior. However, it may be possible to identify favorable schemes for specific decision systems by observing patterns in the behavior of the coordinators and the planners.

Keywords: Distributed Decision Systems; Information Management; Parallel Processing; Linear Programming Decomposition.