

## A STRATEGIC MODEL OF ENVIRONMENTAL UNCERTAINTY

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### ÖZET

*Bu çalışma, örgütlerin sonuç performansını etkileyen değişkenler arasındaki ilişkileri inceleyen dinamik bir model sunmaktadır. Önceki çalışmalardan farklı olarak, bu modelde değişkenler arası bağlantılar tek yönlü sebep-sonuç ilişkileri olarak değil de, karşılıklı etkileşim içinde olan çok yönlü ilişkiler olarak tanımlanmıştır. Stratejik karar üretme sürecindeki en önemli değişkenler objektif çevresel belirsizlikler, algılanan çevresel belirsizlikler, örgütün yapısal özellikleri ve alınmış ve alınmakta olan stratejik kararlardır. Bu değişkenler bilgisayar bazlı bir bilgi sistemine bağlanarak, bilginin hızlı ve doğru akışının karar verme sürecindeki önemi vurgulanmak istenmiştir.*

*Sonuç performansı tüm değişkenlerden etkilendiği kadar, alınan stratejik kararlar ve sonuçlar aynı şekilde çevreyi ve çevredeki belirsizlikleri de etkilemektedir. Bu durum da çoğu değişkenlerin birbirini etkilediği kesintisiz bir döngü meydana getirmektedir. Döngünün herhangi bir halkasındaki değişiklik dolaylı veya dolaysız diğer halkaları da etkileyecektir. Böyle bir model yaratmanın amacı, karar sürecindeki etkileşimleri inceliyerek değişkenleri doğru ve eksiksiz bağlamada ve böylece yüksek performansa erişebilmede yöneticiye yardımcı olmaktır.*

### INTRODUCTION

This paper analyzes the strategic decision making process under environmental uncertainty and emphasizes the importance of information systems in a stochastic decision environment.

Environmental uncertainty is becoming an increasingly vital variable in discussions of the organization-environment interface particularly in models of strategic planning systems (Liedtka, 1985). This is so mainly because of an increasing amount of uncertainty from the structural conditions of life; increasing number and complexity of elements and their interrelationships with a corporate environment.

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## Theoretical Framework on Environmental Uncertainty

Views of selected analysts of environmental uncertainty over the last 25 years can be divided into three major groups (Jauch and Kraft, 1986).

A. Classical views: External environment is a source of uncertainty. Reality of the objective environment influences decisions, structure and performance (March and Simon (1960), Chandler (1962)).

B. Transition views: Source of uncertainty is both internal and external (interdependence, life cycle, complexity, lack of knowledge etc.). Some suggest decision-makers have choices rather than an uncertainty imperative (Child (1972), Galbraith (1973)).

C. Process views: they tend to ignore objective properties. Perceptions of decision makers mediate the link between uncertainty, decisions and outcomes (Lawrance and Lorsch (1967), Duncan (1972)).

There has been some research on the relationship between "objective" and "perceptual" uncertainty. Snyder and Glueck (1982) established positive correlation between perceptual uncertainty and Tosi et al measure of technological, market and industry volatility. But there is also another factor in perception of environment which is individual's cognitive structures. Cognitively complex individuals perceive several dimensions and better predict others' strategies (Schroder (1971), Streufert and Driver (1966)).

Some theorists believe that structural alterations are prescribed to reduce or absorb uncertainty. The assumption is that uncertainty is bad for organizations and that system equilibrium is good (Keller, Slocum and Susman (1974); Lorenzi, Sims and Slocum (1981)). In some other works uncertainty may be neither reduced nor absorbed by managers but rather ignored (March and Feldman (1981)) or attributed to factors outside of their control (Bobbitt and Ford (1980), Ford and Hegarty (1984)). Others criticize approaches which ignore role of objective environment on performance and seek to influence the environment. Miles, Snow, Meyer and Coleman (1978) and Miles, Snow and Pfeffer (1974) suggest that performance can be influenced by different managerial approaches and philosophies. They define "prospectors" as those top managers who actively search for change and uncertainty. Anderson and Paine (1975)



suggest that managers may choose their environments and attempt to manipulate them. Weick (1977), Khandwalla (1976), Miles and Snow (1978), Daft and Darks (1985) also accept that firms may create their own opportunities strategically and do not necessarily decrease uncertainty.

Another group of researchers (Presscott and Montgomery (1981), Rumelt(1982), Lenz (1980) emphasize that environment combined with internal conditions have impact on performance. Hambrick, Mcmillian and Day (1982) argued environmental conditions and strategy combined have a greater effect on performance rather than either one alone.

Mintzberg (1978) categorizes three strategies which are deliberate, unrealized and emergent (unexpected outcomes). Pfeffer and Salancik (1978) state objective environment plays a significant role on performance. Another group of studies have approved the close relation between perceived environment and organizational structure (Khandwalla (1981)).

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Based on stated surveys, it is evident that there is a strong relationship between objective environment, objective environmental uncertainty, perceived environment, structure, strategy and performance. This paper proposes a model that will show the interactions among these these variables along with an information system. The model is an extra contribution to works of Masoud Yasai-Ardekanil (1986) which analyzes environment- organizational structure relationship and Gregory Dess and Nancy Origer (1987) which propose a model that defines the key variables and relationships in strategy formulation. The former model explains how different structural forms can be adopted in response to same environmental stimuli. Managers' perceptions of their environments occupy a central position in the model and provide the only linkage between environments and organizational structures. The latter model distinguishes between objective and subjective measures of environment. It also includes an interactive relation between performance, structure and strategy formulation.



The model proposed in this paper is revisionist dynamic model for (a) strategist. (s) in a uncertain environment (Figure 1). Before explaining the model, uncertainty concept should be clarified. There are two dimensions related with uncertainty which are complexity (heterogeneity of and range of environmental activities) and dynamism (extent of change in environmental elements). Environmental uncertainty is lack of information regarding the environmental factors associated with a given decision making situation or it is the case of not knowing the consequences of the outcome of a specified decision. These concept are strongly related to perceived uncertainty as given in the following graph (Figure 2).

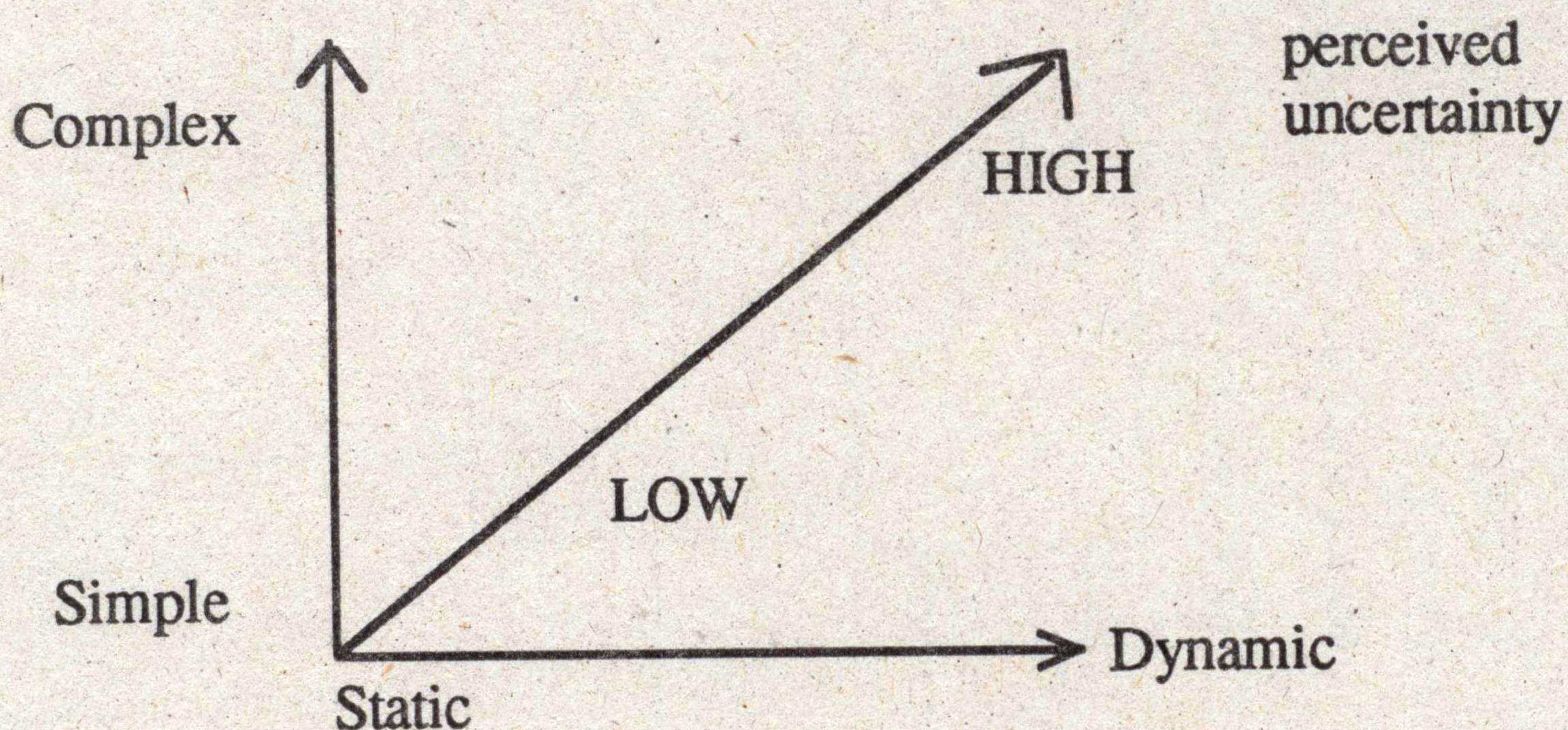


Figure 2. Effect of environmental dimensions on perceived uncertainty

The general model shows decision sequence of a strategist and also multiple iterations of decisions. Based on this, perception, which is influenced by individual differences and perceived internal strengths and weaknesses, has an effect on both structure and strategy along with a two-way effect between the two. Structural responses to perceptions of competition, for instance, can differ depending on manager's perceptions of other environmental attributes. If growth in industry demand is perceived, greater differentiation and decentralization may follow along with greater use of specialists and so response will go more timely. Perception of decline in industry causes reduction in employees and centralization to keep survival. Organizational structure and strategic decisions are mutually related. For example, if information from different managerial levels are of vital importance to decisions taken or if the decision environment is dynamic, competitive and requires quick action then



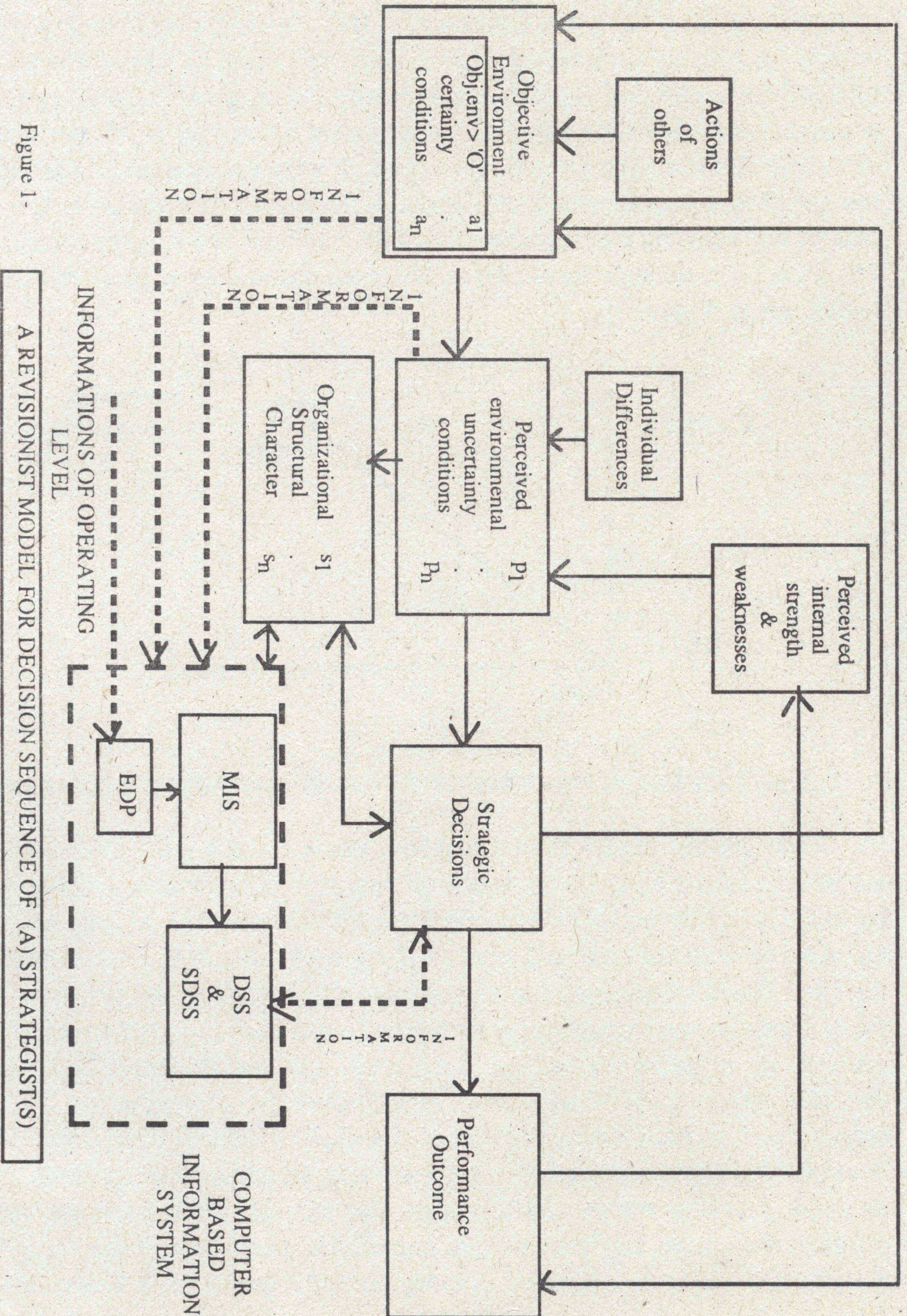


Figure 1-

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structure should be flexible , decentralized. If structure doesn't fit then it should be revised through strategic decisions and perceptions. Vice versa, if structure is flexible, it effects decision making in a sense that it will disperse power to different levels and it disseminates information more quickly and easily. Strategy also has an effect on objective environment and uncertainty within it. Strategy decisions also have an effect on performance outcome effecting objective environment and its uncertainty. In the dynamic model, objective environment is being influenced also by actions of others.

Basically, this part of the model shows that uncertainty is not always 'bad' but can also be desirable, such as an outcome of a "prospector" manager may help to increase the uncertainty in the environment deliberately. Objective environment has an important effect on performance, outcome as well as perceived environment. Interaction of strategy, structure and environment influence performance.

## CONCLUSION

This study defines a dynamic relationship among different factors that result in performance outcome through a model. The model rather than giving a one-way causal relationship, proposes multi-way relationships among variables-objective environmental uncertainty factors, perceived environmental uncertainty factors, organizational structure, strategic decisions, performance outcome. Rather than defining performance outcome as the resulting variable, it is also a mediating variable which in turn effects the objective environment and uncertainty factors within it. So one comment is that objective environment not only effects `but is also effected by strategic decisions and performance outcomes within the environment. Another comment is that there is a strong relationship between perceived environmental uncertainty, organizational structure and strategic decisions made. The relationship among these variables is also multi-way rather that causal. These vital variables are also linked to the computer based information system to emphasize its vitality in implementing various alternatives of above mentioned variables

The aim to develop a multi-way related model is to emphasize how variables effect and are effected by each other, and thus aid (a) strategist(s) to match the variables in the optimum way to obtain high performance. Analyzing the relationships in the model, it can be suggested that the match between envi-



ronmental volatility and managers perceived environmental uncertainty should be high. For high environmental volatility, number of strategic objectives should also be high. In terms of organizational structure, decentralization (centralization) is likely to contribute to high performance in the case of high (low) perceived uncertainty. In this situation, as environment becomes more uncertain. In this situation, as environment becomes more uncertain, there will be need for more information and thus for greater information capacity which necessitates the existence of a computer based information system.

#### REFERENCES

- Bourgeois, L.J. "Strategic Goals, Perceived Uncertainty and Economic Performance in Volatile Environments" *Academy of Management Journal*, 1985, Vol.28, No.3, pp. 548-573.
- David F.R. "Computer Assisted Strategic Planning in Small Businesses" *Journal of Systems Management*, 1985, pp. 24-34
- Downey K., Hellriegel D., Slocum J. "Environmental Uncertainty: The Construct and its Application" *Administrative Science Quarterly*, 1975, Vol.20, pp. 613-629
- Duncan R.B. "Characteristics of Organizational Environments and Perceived Environmental Uncertainty" *Administrative Science Quarterly*, 1972, vol.17, pp. 313-327
- Frances J.M "Three Types Of Perceived Uncertainty about the Environment: State, Effect and Response Uncertainty" *Academy Of management Review*, 1987, Vol.12, No.1, pp. 133-143
- Govindarajan V. "Decentralization, Strategy and Effectiveness of Strategic Business Units in Multibusiness Organizations" *Academy of Management Review*, 1986, Vol.11, No.4, pp. 844-856.
- Gregory G., Oringer N. "Environment, Structure and Consensus in Strategy Formulation: A Conceptual Integration " *Academy of Management Review*, 1987, Vol.12, No.2, pp. 313-330.
- Swanidass P., Newell W. "Manufacturing Strategy, Environmental Uncertainty and Performance " *Management Science*, 1987, Vol.33, No.4
- Wysong E. "MIS in Perspective" *Journal of Systems Management*, 1985, pp. 32-36
- Yase: Ardekani M. "Structural Adaptations to Environments" *Academy of Management Review*, 1986, Vol.11, No.1, pp. 9-21.