

An effective MNC requires a specially designed strategic intelligence system to monitor complex and changing international environments.

# The MAPS Design Technology: Designing Strategic Intelligence Systems for MNCs

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TODAY'S MULTINATIONAL CORPORATIONS (MNCs) are facing increasingly complex and uncertain environments which pose more complex and ill-defined problems than these organizations previously encountered. In many cases, the information needed to analyze these problems is not readily available; and because the environmental context in which the problem is defined keeps changing the information will never be completed. This is especially true for *strategic* type problems and issues that the MNC must address. These problems necessitate the appreciation and actual monitoring of the organization's complex environment since strategic planning and strategic problems directly involve the relationship of the organization to its environment.

Most or even all MNCs go about the task of assessing and collecting environmental information

that is critical to their strategic planning and decision making. Often, however, the mechanisms for acquiring such information are largely ad hoc and informal. Key decision makers typically rely on "contacts" they have in foreign nations, the services of various news media and other intelligence agencies, or the advice of staff groups whose main jurisdiction may not include the gathering of strategic information on international events. Regarding the latter, decision makers may even expect that they will "naturally be informed" if some critical incident or development takes place in a foreign nation.

An important theme in this article is that the MNC may very well need a formally designed strategic intelligence system (SIS) in order to assess, collect, and evaluate the vast amount of information from the international environment

which directly impinges on the functioning of the MNC. Otherwise the MNC may be ignoring the nature of the international environment which is much more dynamic and complex than that of its domestic environment.

### **International Business and Uncertainty**

While the managerial functions of MNCs transcend national boundaries, this is more than a step into different social, political, economic, technological and institutional sets of forces. It involves dealing with environments that differ not only from the domestic environments but also among themselves. Authorities have argued that international business is plagued with uncertainty.<sup>1</sup> Specifically, in the organizational context uncertainty embraces several phenomena. They are:

- felt uncertainty about future events;
- felt uncertainty about the causes or consequences of events; and
- felt uncertainty about what responses to make to events.

For example, government policies with regard to MNC activities, economic trends, social acceptance, international trade, and regional common market directions are sources of uncertain events. The consequences of those events on the MNC's market sales and profits are another source of uncertainty. The proper response to these events is still another source of uncertainty.

Related to this general uncertainty, are the MNC's environmental conditions of "malevolence" and "munificence." Environmental malevolence can be defined as a condition of perceived threat to the MNC's operations and the company's primary goals and objectives. Political instability, social unrest, military uprising, and revolutionary stages, for example, create environmental malevolence and these may pose a serious threat or potential harm to the MNC because they may lead to situations such as nationalization, expropriation or confiscation of company properties. Negative government and public attitudes toward the MNC, or severe conflict between national and the corporate interests, may present a serious threat to the MNC's entry and exit, liquidity, market share or profitability. Economic decline, low per capita income, geographic

distance, climate, low level of industrialization, high illiteracy rate, poor economic and industrial infrastructure are all likely to be perceived by the MNC as malevolent environmental conditions. On the opposite pole lies a condition of munificence. For example, developing countries who offer various incentives in terms of tax holidays, government loans and insurance to attract foreign investments in order to solve the country's surplus labor problem, provide a favorable environment for MNCs whose production is labor-intensive, at least in the short run.

However, the impact of environmental uncertainty on the MNC makes strategic planning difficult. If the MNC feels uncertain about the external environmental variables (i.e., political, economic, marketing, etc.), it becomes more difficult to answer the following questions:

- When, where, and to what extent should the MNC expand its international commitments in funds, technology and personnel?
- Should it enter a new world market?
- Where should it establish or acquire new manufacturing plants?
- Where and to what extent should it expand existing plants?
- What new products should it market?
- To what extent should it change its marketing and product mixes in various countries?
- What sources of funds should it use for its global operations?
- Should it go into joint ventures with other domestic or foreign companies?

Strategic planning and a strategic intelligence system (SIS) are intended to help an MNC make better decisions under uncertainty. It has been emphasized that the introduction of a modern intelligence activity into the multinational corporation is one of the most challenging tasks of business management today and that the future success of business in world markets will depend less on technological advantages and more on the ability of the international manager to deal with multinational intelligence.<sup>2</sup> Business International Research Report concludes that intelligence is the power the MNC needs to survive and grow in the near future.<sup>3</sup>

This article will maintain that providing intelligence for MNCs to use in answering important strategic questions is a problem of *organization design*. The MNC can design a strategic intelligence system (SIS), i.e., groupings of people, tasks, and objectives, to successfully monitor and adapt to its extremely complex and dynamic environments. This article presents a design technology referred to as MAPS (Multivariate Analysis, Participation, and Structure), which enables the MNC to quickly and efficiently design alternative SISs, and to evaluate their usefulness to the organization. This technology is based on the use of systematic data collections and multivariate statistical analyses to process all the relevant, qualitative information that influences the nature and scope of designing an effective SIS.

### **Conceptual Issues Affecting SIS**

An SIS is defined as the organized effort to obtain data, information and intelligence that relate to opportunities and problems that occur outside of the corporation; to appraise the information bit by bit (i.e., via differentiation); to piece it together so that it forms clearer patterns (i.e., via integration); and to disseminate it to appropriate persons or sub-units, enabling them to understand more clearly the external environment in which the MNC exists. From the view of MNC management, strategic intelligence is: the foreknowledge (about foreign countries and competitors and their probable intentions, capabilities, and vulnerabilities) that results from the system defined above and that decision makers must have to guide their corporations; as a system it is a design of sub-units which pursues this relevant kind of foreknowledge.<sup>4</sup>

This perspective builds upon the growing literature on organization design.<sup>5</sup> Research has found that the effective organization attempts to manage environmental uncertainty by differentiating itself into sub-units (e.g., divisions, departments, work groups) in order to appropriately confront different task environments (i.e., segments of environmental uncertainty).<sup>6</sup> It has been suggested that the differentiation objective is to identify the important interdependencies among environmental events,



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states, qualities, so that the heterogeneous environment can be efficiently differentiated and contained within homogeneous, manageable sub-units.<sup>7</sup> Following, the effective organization applies integrative mechanisms to coordinate the various sub-units into a functioning whole.

A major problem with such design approaches, however, is the assumption that an organization designed for operational purposes (i.e., the organization's short-run activities), is equally effective for strategic planning. Basically, uncertainty at the strategic level may not "fit" well into the organization's design categories that were established for operational objectives. Further, because of the qualitative differences between international and domestic environments, it is even more likely that the domestic stereotypes of design (e.g., marketing, production, and finance) will not cover the important and interrelated problems resulting from international issues. Thus, an important environmental development in the international scene may not only seem, "not relevant to my department," as the bureaucratic phrase so aptly describes it, but the environmental development may not be reflected in any department. The extent to which this is the case, constrains the MNC's ability to sense strategic intelligence which may be vital for its success. Consequently, the sub-units of the SIS may need to be differentiated along dif-

ferent dimensions than the MNC's operational units.

In designing an SIS for MNCs, the important environmental interdependencies must be identified and separated into independent, homogeneous clusters. A formalized design must be provided which groups people, tasks, and strategic objectives into strategic intelligence sub-units so that the environmental clusterings can be explicitly addressed. Such an SIS design may be quite different than the operational design but can exist collaterally with it. In fact, the extent to which the SIS and operational designs are different, may require some mediating or integrative devices to enable the two designs to coordinate their efforts into a functioning whole (e.g., to effectively translate strategic intelligence into operational decisions). Thus, what has been presented as a design problem across different sub-units (i.e., integration), is equally relevant for coordinating two different *sets* of sub-unit designs.<sup>8</sup>

A further conceptual issue regarding the design of an SIS concerns the differences between a bureaucratic versus an organic-adaptive organization design.<sup>9</sup> The great majority of contemporary organizations are designed for operational purposes according to bureaucratic principles: top management determines the major objectives, policies, procedures and rules to maintain close and rigid control over members' behavior. Research indicates that such bureaucratic organizations are most effective in stable environments, and require organizational members who prefer to work in highly programmed roles with little responsibility for decision making. In contrast, the organic-adaptive organization is designed to confront and be adaptive to dynamic environments, and needs to be staffed by resourceful and self-motivated individuals.

The organic-adaptive design would appear to be the most appropriate to the development of an SIS, a system that specifically addresses uncertain and dynamic international environments. In view of this, the literature on organization design and development can suggest certain necessary properties of this type of design in order for it to

be effective. First, research on participative management and management by objectives, implies that the members of the SIS should have some influence on how the SIS is actually designed (i.e., how members and tasks are grouped into sub-units) and what objectives the various sub-units are to pursue.<sup>10</sup> Such participation in the design process is expected to generate (if not maximize members' commitment and motivation to perform effectively. Second, this participation should be guided in a manner that assures that the important task interdependencies are contained within the sub-units as much as possible. Besides being better able to confront the complex environment, this containment of interdependencies would facilitate the development of cohesive, autonomous work groups.<sup>11</sup> Third, the SIS design should be conducive to organizational development (OD) efforts which attempt to help each SIS sub-unit decide upon and become committed to a purpose, as well as to marshal its problem solving, communication, and leadership abilities to accomplish this purpose.<sup>12</sup> And fourth, to be further responsive to environmental changes, the SIS design should be amenable to *design changes*, which indicates that the design of the SIS needs to be a recurring process for the MNC to manage along with the traditional processes of problem solving, decision making, leadership, and so forth. In essence, as the MNC's international environment changes so does the SIS design of sub-units to effectively contain and manage the changed interdependencies.

### **The MAPS Design Technology**

A technology has been developed to design an effective organic-adaptive organization by systematically applying the concepts of participative management, management by objectives, the management of interdependencies, and organizational development, as presented above.<sup>13</sup> Regarding the design of an SIS as analogous to the design of an organic-adaptive organization, the MAPS Design Technology is specifically based upon:

- The *participation* of members of the organization in defining the specific strategic intelligence tasks that they

believe would best help accomplish organizational objectives;

- Using *multivariate analysis* to separate the total set of tasks from the members of the organization (or division) into task "clusters" such that the important task interdependencies are contained within the clusters;
- Using multivariate analysis to place members into sub-unit *structures* such that the members in each sub-unit have similar preferences as to the task cluster to be addressed by the sub-unit and that the members of each sub-unit can work well with one another in the pursuit of organizational objectives; and
- That such a separation of tasks into task clusters and members into sub-unit structures is conducive to organizational development (OD) efforts which seek to operationalize the full potential of the organic-adaptive design into effective individual, group, and organizational behavior.

The MAPS Design Technology consists of as many as 12 distinct steps starting from the identi-

fication of an organization problem that can be defined as the need for an SIS to evaluate whether or not a new implemented design (e.g., the SIS design) actually improves organizational effectiveness (i.e., that the design change actually solves or manages the initial problem). (See Exhibit 1)<sup>14</sup>

Central or core to the MAPS Design Technology are Steps 5, 6, and 7—the input, analysis and output of the computerized design process. This core is what makes MAPS operational, and around which, the prior and later steps have been developed. Without this core, MAPS would be strictly a qualitative technology and therefore would not have the advantages of quantitative formulations. Thus only through the use of multivariate analysis can all the relevant information needed to design an organic-adaptive organization, be processed and utilized, i.e., no group of top management could possibly comprehend and process all the task preferences, task abilities, interpersonal preferences, task interdependencies of 20 or more members in order to designate an effective organic-adaptive organization.

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## EXHIBIT 1

### The Steps of the MAPS Design Technology

- (1) Entering and diagnosing the organization.
- (2) Conceptualizing the design problem and determining the boundaries of the analysis (e.g., who is to be included, which departments, divisions, etc.).
- (3) Specifying the design objectives (e.g., designing for operational purposes, for strategic planning, etc.).
- (4) Choosing one of the scientific models of MAPS (i.e., different combinations of input variables, computer analyses, and output formats in relation to design objectives or conceptual models of the problem).
- (5) Developing the task and/or people items for the MAPS questionnaire (i.e., tasks to accomplish, people to work with on the tasks).
- (6) Responding to the MAPS questionnaire (e.g., the extent to which each respondent would like to work on each task, and to work with each other respondent).
- (7) Analyzing the design data from Step 6 via the the MAPS Computer Program (i.e., using multivariate statistics to generate alternative organization designs by showing which groups of people should work on which clusters of tasks).
- (8) Selecting a MAPS design (i.e., choosing one of the several designs that can be generated in Step 7 via a dialectic debate).
- (9) Implementing the selected design (i.e., providing resources, authority, policies, responsibility, etc. for members to actually work in new design—team building and support to help them learn to work effectively in new design).
- (10) Monitoring the implementation process (e.g., assessing resistances to change, emerging problems, etc., and then utilizing strategies to best manage the process).
- (11) Evaluating the results of the design change (i.e., does the new design solve or manage the initial problem?—does the new design improve organizational effectiveness?).
- (12) Re-diagnosing the organization (i.e., re-instating the diagnostic process in Step 1).



In brief, multivariate techniques, such as factor analysis, are ways of reducing the apparent complexity of large amounts of information to a number of separate clusters by eliminating redundancy. Items of information are grouped together because they overlap (i.e., are similar and "co-vary" together) while the separate clusters or groupings themselves are unique (i.e., are dissimilar and independent). As will be seen, not only does a multivariate technique (factor analysis) reduce the complexity of large amounts of information, but the resulting clusters of information are totally consistent with the objective of an organic-adaptive design (e.g., containing the important task and member interdependencies *within* the clusters, or sub-units, so that they can be effectively managed). Perhaps a major reason why organizations have been designed according to bureaucratic principles is because methods such as MAPS, which allow the many relevant members of the organization to successfully and efficiently participate in the design process, were not available.

It is important to point out that the core of MAPS, while being the concrete and computerized aspect of the technology, is in a broader sense the smallest aspect of the whole technology. In particular, the steps of the technology prior to the core are primarily diagnostic and educational while the steps following the core are primarily concerned with implementation. The reasons why the prior and latter steps are so important relative to the core (even though the former are qualitative), is that the prior steps determine the validity of the data gathered in the core, while the steps that follow determine if the potential of the MAPS output will be realized. Consequently, while the following discussion on MAPS concentrates on the core of the technology (i.e., developing the MAPS questionnaire and analyzing responses to this questionnaire in order to choose a particular design) it is important to keep in mind the importance of the other steps, especially the proper implementation of a derived SIS design. We will return to the issue of implementation in the conclusion of this paper.

## **Developing the MAPS Questionnaire**

The MAPS Design Technology requires the members of the organization to respond to two types of questionnaire items: (1) what particular tasks within the scope of an employee's influence he perceives as important to accomplish organizational objectives either now or in the future and (2) the extent to which the member can interact well with the other people in the organization in the process of performing organizational tasks.

In applying the MAPS technology to designing an SIS, it is necessary to determine the boundaries of the design analysis. Should all the members in the MNC (or their representatives) be involved, or just those who are now members of a strategic intelligence division? Should individuals who represent various environmental or community groups that impinge on the MNC (e.g., foreign government representatives) be included? This decision will normally be based on a number of factors including:

- the scope of the MNC's environment and the number of people in the organization,
- the identification of strategic interface conflicts between two or more MNC operational sub-units, and
- whether it would be functional for one or more "autonomous" MNC divisions to have their own SIS.

For example, in one application of MAPS for designing an SIS for a major MNC, 54 persons were involved in the design analysis. They were from three levels in the hierarchy (top, middle and lower management), from five functional areas (marketing, finance, planning, engineering, and production), and from four product groups (energy systems, heavy industry, consumer industry, and management services).

*Task Items.* Once the design boundaries have been defined, it is desirable to have all members within these boundaries involved in the development of the task items because:

- their inputs (information, perspectives, interests, task abilities, etc.) are probably the most relevant concerning the possibilities for attaining strategic information, and

- their commitment to any new SIS design is essential in order for that design to be successfully implemented in the organization.<sup>15</sup>

A general procedure for developing the task items is for top management of the MNC to first outline some broad categories of either organizational objectives or basic functions to which the MNC is committed. Then the members are asked to generate specific task items which describe the strategic intelligence which they are now receiving or collecting, feel they should be collecting, or wish to be collecting, that fall under the categories outlined by top management. This process attempts to integrate individual and or-

ganizational perspectives in a manner analogous to management by objectives.<sup>16</sup> If a large number of task items are generated (greater than 100), it will usually be necessary for a representative group to look over the list and eliminate or combine redundant or ambiguous items. The final list should be approximately 30 to 80 items that are agreeable to both top management and the members involved, where each item is very concise (one or two phrases) and whose meaning is entirely clear to all members in the design analysis.

Exhibit 2 gives an illustration of how a list of task items is developed in the first portion of the MAPS questionnaire. The items were de-

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**EXHIBIT 2**

**An illustration of the MAPS Questionnaire**

Section 1: Please indicate how much you would be interested in participating in each of the following strategic intelligence activities.

	Not at all	Much below ave.	Below ave.	Average	Above ave.	Much above ave.	Of prime interest
measuring and predicting public (national) attitudes toward the MNC	_____	_____	_____	_____	_____	_____	_____
anticipating military uprisings and monitoring revolutionary stages	_____	_____	_____	_____	_____	_____	_____
assessing regional common market directions	_____	_____	_____	_____	_____	_____	_____
anticipating changes in international trade barriers	_____	_____	_____	_____	_____	_____	_____
etc. . . .							

Section 2: Listed below are all the participants in this analysis. With regard to the items which you most strongly endorsed in Section 1, please indicate how much each individual could contribute to your performing effectively on those items.

	Don't know person	Not at all	Much below ave.	Below ave.	Average	Above ave.	Much above ave.	None could more
John Doe	_____	_____	_____	_____	_____	_____	_____	_____
Bill Green	_____	_____	_____	_____	_____	_____	_____	_____
Sam Jones	_____	_____	_____	_____	_____	_____	_____	_____
Jim Smith	_____	_____	_____	_____	_____	_____	_____	_____
etc. . .								

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veloped by specifying some of the strategic intelligence issues that have been presented in the literature.<sup>17</sup>

*People items.* The second type of item appearing on the MAPS questionnaire is termed "people" items. The items are simply a listing of all the members who are involved in the design analysis. As illustrated in Exhibit 2, each member is then asked to indicate how much each individual listed could contribute to his performing effectively on the tasks he most strongly endorsed. The respondent to the questionnaire also has the opportunity to indicate if he "does not know" one or more listed individuals, which is quite possible if the respondents come from different sub-units in the MNC. However, the responses to the second part of the MAPS questionnaire at least collect what information is available and known about how well members can work with one another.

In essence, the people items attempt to summarize the interpersonal factors, shared interests, skill evaluations, and political reasons for desired interactions among members. Naturally, because of the general manner in which the questionnaire is phrased, each member can apply his own criteria. This also affords the possibility of members' choosing one another based on congruency (i.e., compatible differences) as well as on similarity. Basically, if various groups are composed of individuals with too diverse interpersonal styles, attitudes, values, etc., the sub-units would have a difficult time in fully utilizing their technical resources in a task environment that requires much interaction among members. Consequently, an SIS type of design needs to be formally based on some interpersonal and perceived technical compatibility within sub-units.<sup>18</sup>

### **The MAPS Analysis**

While a great variety of multivariate analyses are possible from member responses to the MAPS questionnaire, the following are most significant for the development or possible change of an SIS design for an MNC:

- separating the list of task items into distinct "clusters" representing various

strategic intelligence task structures for the MNC, and

- separating respondents to the MAPS questionnaire (i.e., the members directly involved in the design) into formal sub-units to address the various strategic intelligence task clusters.

*Forming task clusters.* The task items are separated into clusters by factor analysis.<sup>19</sup> The properties of this procedure that are most useful for organization design include high intercorrelation of task items within the same cluster, and low intercorrelation across the different clusters. A desirable feature of high intercorrelation of task items in a cluster is that all the task items placed in the same cluster are seen by organization members as *belonging together* for one reason or another, which suggests that those task items should be addressed together (i.e., in one sub-unit of the SIS design). Furthermore, the low intercorrelation across the task clusters suggests that the different clusters of tasks can be performed relatively independent of one another, by different sub-units in the SIS design with minimum needs for coordinating activities across the sub-units.

The basic property of the MAPS analysis which suggests minimum coordination across the separate clusters of task items is that all the important task interdependencies are contained within the clusters, and therefore, these interdependencies can be managed explicitly and not left to develop into unidentified survival problems for the MNC. For example, one piece of strategic information may need to be *directly* linked with some other piece of strategic information for the organization to understand the significance of an environmental development. The MAPS procedure is designed to draw out these inter-relationships of environmental events into a separate task cluster. Without this procedure, the single task items might remain uncoordinated or simply not be linked together appropriately.

The MAPS analysis also allows the list of task items to be separated into different numbers of clusters. Thus, 70 task items might be distributed into five, six, or perhaps as many as 20 clusters. These different task clusters might represent dif-



EXHIBIT 3

An illustration of the MAPS Design Matrix for a Five Cluster Solution:  
50 Members and 70 Task Items.

50 Members Distributed as:	70 Task Items Distributed as:				
	TC1	TC2	TC3	TC4	TC5
SUB-UNIT 1 (10 members)+		*			
SUB-UNIT 2 (5 members)	*				
SUB-UNIT 3 (8 members)					*
SUB-UNIT 4 (12 members)			*		
SUB-UNIT 5 (15 members)				*	

TC1 = Task Cluster 1 with specified task items, etc.

\* = The most efficient matches between sub-units and task clusters. With statistical means inserted into the elements in the matrix (based on member responses to the MAPS questionnaire), a "goodness of fit" index can be computed to compare the efficiency of several design solutions that can be derived from the same MAPS data source (i.e., comparing the five cluster solution with the six cluster solution, etc.).

+ = Members of each sub-unit would be listed in alphabetical order.

ferent strategic task structures for the organization while each structure attempts to contain the important task interdependencies within the clusters.

*Forming sub-units of members.* The second type of MAPS analysis concerns the creation of SIS sub-units of organizational members that can be utilized to address specified strategic task clusters. In essence, this is the core of the MAPS Design Technology in that sub-units of members are actually identified as being able to pursue strategic intelligence needs with the greatest potential for developing an effective SIS. MAPS thus sets the stage for a mechanism to *implement* an SIS design. Without this latter mechanism, the analysis thus far has only indicated possible strategic task clusters within the pre-existing operational sub-units of the MNC. Unless an SIS design of sub-units can be provided that reflects such new task

structures (i.e., groupings of members), it is unlikely that any systematic, coordinated, and integrated strategic intelligence will be developed.

The basis of this analysis involves separating the respondents of the MAPS questionnaire into sub-units according to their similarity in endorsing strategic task items and similarity in indicating who of their colleagues they can best interact with in the pursuit of such tasks. Respondents are therefore placed in the same sub-unit if they have congruent interpersonal styles, values, skills, and shared commitment towards the tasks to be addressed. A sub-unit that has this congruency is more likely to marshal its resources, and if at the same time the sub-unit has some consensus on what specific strategic intelligence issues the members would like to actively pursue, then it is expected that the sub-unit will be able to efficiently and effectively strive towards its objectives.

The MAPS analysis of respondents, just as the analysis of the task items, permits different solutions. That is, a given number of respondents can be divided into different numbers of sub-units. Thus, 50 members might be distributed into four, five or up to fifteen sub-units. Each solution presents a somewhat different way of decomposing the membership while each solution attempts to bring members who have interpersonal and task congruency into sub-units.

*Selecting a particular SIS design.* The foregoing MAPS analyses can be combined to specifically match-up each SIS sub-unit of members with a task cluster for each possible design solution (i.e., the

number of clusters that are separated out for both sub-units and tasks). For example, the "five cluster" solution would separate 70 task items into five task clusters and 50 respondents into five sub-units of members. Exhibit 3 illustrates the "MAPS Design Matrix" for this hypothetical situation. Then, various management science operations research methods are used to assign each sub-unit one of the task clusters with the objective of maximizing the overall "fit" between the two. In other words, as much as possible each sub-unit would be matched with a task cluster that represents the members' first choice. The same match-ups can be determined for a six cluster solution, a

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**EXHIBIT 4**

**I. Financial Sub-unit**

(assigned to 13 persons)

Capital Availability  
Acquisition and Merger Possibilities  
Projection of Cash Flows  
Return on Investment  
Monetary Exchange  
Insurance Against Risks

**II. Political Sub-unit**

(assigned to 10 persons)

Host Government Political System  
Political Instability  
Relations with Neighboring Countries  
Political Party Factions  
Military Elite Power in Politics

**III. Resource/Legal Sub-unit**

(assigned to 9 persons)

Restrictions on Ownership  
Level of Industrialization  
Raw Materials Availability  
Availability of Cheap Labor and  
Trained Management

**IV. Marketing/Cultural Sub-unit**

(assigned to 5 persons)

Legal System of Host Country  
Host Government Attitudes Toward  
Foreign Investment  
GNP/Per Capita Income  
Market Potential  
Distribution Channel Systems  
Production Costs  
Social/Cultural Factors Impacting  
Upon Products

**V. Legal/Economic/Political Sub-unit**

(assigned to 7 persons)

Host Government Attitude Toward  
Foreign Investment  
Tax Laws  
Import/Export Restrictions  
Inflation  
Relations with Supra-National Organizations  
Technology and its Transferability

**VI. Economic/Marketing Sub-unit**

(assigned to 3 persons)

Demand and Supply Conditions For the Product  
Competition  
Infrastructure to Support Business

**VII. Cultural Sub-unit**

(assigned to 7 persons)

Social Unrest  
Religion/Language/Racial Barriers  
Labor Organizations  
Public Literacy  
Public Attitude Toward Foreign Investment  
Living Conditions for American Managers and  
Their Families

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seven cluster solution, etc., until the MAPS procedure has reached its statistical limits. At this point an index can be computed which describes the "closeness of fit" (i.e., the coefficient of purposefulness) between sub-units and their assigned task clusters, for each of the cluster solutions. With this index, the single "best" SIS design can be selected for implementation into the MNC's current operational design.

*An illustration of a MAPS SIS design.* Exhibit 4 shows an "optimal" MAPS design solution which was generated from data provided by a major MNC. The company is and has been among the top 50 of the Fortune 500 and is also one of the largest multinational corporations in the world. The company operates several hundred subsidiaries, of which approximately one-half are foreign subsidiaries scattered in 34 different nations.

The SIS design, as can be seen from Exhibit 4, consists of seven task clusters (from a total of 38 task items on the MAPS questionnaire) assigned to seven people clusters (a total of 54 persons who are widely distributed throughout the MNC according to hierarchical level, functional area and product group, as referred to earlier). We have provided a label for each task cluster to summarize the particular strategic information which each SIS sub-unit is to collect and process for strategic planning and decision making. It should be evident by observing the items which clustered together that the "containment of interdependencies" has been accomplished well by this MAPS SIS design, and that the task items themselves represent critical strategic intelligence issues for MNCs facing dynamic, complex and uncertain international environments.

### **Conclusion:**

#### ***Implementing the SIS Design***

This paper has presented the MAPS Design Technology for mobilizing organizational resources to develop an effective strategic intelligence system which enables the MNC to be adaptive and responsive to dynamic and uncertain international environments. The core of MAPS alone, however, cannot guarantee that each identified SIS sub-unit

will fully develop its potential and be able to effectively coordinate its activities with the other SIS sub-units and with the operational sub-units of the MNC. Usually some specialized implementation program would be necessary to develop the potential represented in the MAPS design solution into effective organizational behavior.<sup>21</sup>

A first step of implementation would have each identified sub-unit meet and prepare a detailed statement concerning the title, objectives, and scope of its task cluster with information regarding the resources, technology, and plans that will be necessary to successfully implement the task cluster. Consideration would also be given to the "leadership structure" within the sub-unit (i.e., how each member can influence the management and activities of the sub-unit), and whether a further sub-division of members within the larger SIS sub-unit would facilitate the efficient performance of the task cluster. Regarding the latter, if a sub-unit has 20 or more members, it might be useful to apply the MAPS technology to further specify the design of the sub-unit.

A second step of implementation would have each sub-unit share its "identity" statement with the other SIS sub-units. This would tend to foster an awareness of potential interface problems among the sub-units, and to have each SIS sub-unit realize that it cannot operate entirely independent of the others. The same sharing should also occur between the SIS sub-units and the MNC's operational sub-units so that each will appreciate the perspective and tasks of either design.

Further, the extent to which the MNC is committed to developing a truly effective SIS design entails additional programs in most instances. Specifically, the methodologies of team and inter-team building would need to be applied over an extended period of time in order to help MNC members learn a new kind of management and organizational behavior.<sup>22</sup> In general, most individuals have not experienced what it is like to work in an organic-adaptive SIS, where the outputs of the strategic intelligence activity need to be carefully integrated with the organization's operational activities. Such organizational develop-

ment is the educational and implementation process which not only provides members the opportunity to experience such organic-adaptive designs, but helps them to increase their effectiveness in adapting to dynamic and uncertain environments.<sup>23</sup>

As a result of these implementation programs, the members who were designated or volunteered for participation in the SIS design begin collecting information pertaining to their task cluster. For MNCs facing extremely dynamic and diverse environments, this may require from five to ten hours per week, where members spend the rest of their time (30 to 40 hours) in their day-to-day organizational roles. In less dynamic environmental settings, the members of the SIS design may meet only every other week or once a month in order to collect and organize the information objectives in their task cluster. In other words, the amount of time that the MNC members devote to an SIS design depends on the relative dynamic nature of the environment. In some cases, the MNC may find a need to absorb members into the SIS design (either from inside or outside the MNC) to work full-time in the process of gathering strategic in-

telligence. In any event, the organized information which flows from the SIS design is the foundation for subsequent strategic planning and decision making for the MNC.

As a continuing focus on organization design and development, however, it is important that the design process should not stop simply because an SIS design has been implemented. Aside from the many unforeseen obstacles that are likely to be encountered during the implementation phase, the SIS design can become out of date with changes in the MNC's task environment. Consequently, the MNC could well institute a periodic review of its SIS design (perhaps a periodic use of the MAPS Design Technology) to keep the theory and practice of designing for strategic intelligence as a recurring management process. Certainly, the development of effective SIS designs is vital to the growth and survival of MNCs in the extremely complex international environments, which necessitate a continuing process of SIS design assessment, design creation, implementation and re-assessment.

#### NOTES

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