

ENVIRONMENTAL STABILITY OR COMPLEXITY FOR STRUCTURE DESIGNING? A STUDY IN MEDIUM-SIZED ENTERPRISES IN YUCATAN, MEXICO.

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ABSTRACT

It is important for organizations that the structure corresponds to the environment. The objective is to know, from the perspective of executive managers, what they consider for designing organizational structure: stability or complexity.

A correlation cross sectional study was developed in 23 medium-sized enterprises (manufacturing, commerce and service), in which their executive managers, area managers and operative workers participated in a survey which consists of two instruments: one for verifying their perspective about structural performance, and another for knowing how they consider their environment in two dimensions: stability and complexity, according to Duncan's classification. The study was developed in Merida, Yucatan, Mexico in the second semester of 2006.

The results show that environmental complexity is more considered than stability by executive managers for designing their organizational structure. There is also a strong correlation between structure designing and organizational performance, which corresponds to what was expected according to the authors in the supportive literature.

As structures are designed based on complexity more than in stability, which had not been discussed before at least for enterprises in the South-East of Mexico, their response to environmental change tends to be slower than necessary; decision making takes a long time and the mechanistic paradigm prevails. Helping organizations consider both stability and complexity could make them respond in a faster and more accurate way to environmental change, making them more flexible, productive and competitive.

Keywords:

Organization Structural Design, environmental stability, environmental complexity, Organizational Change, Mexican enterprises.

JEL: M10

INTRODUCTION

As the world is changing in a very dynamic way, organizations are now facing changes in the environment and must effectively adapt to it, in order to survive and be competitive. Most of them have to deal with a growing uncertainty in the environment and become more dynamic and complex. For example, multinational enterprises become global and new competitors are more aggressive, flexible and innovative, moving to different markets to ban competitive advantages larger enterprises had before. Distribution channels change from one country to another and are modified almost every day through the use of more complex information systems (Wheelen and Hunger, 2007). Closer relations with suppliers allow lower costs, increase quality and access to new technology. The changing speed could make the environment change from stable to unstable (dynamic), and from simple to complex.

When an enterprise closes and leaves the market, it could be due to lack of planning, not having the adequate product, lack of accurate financial control or problems with its staff, in addition to not knowing the environment and for not designing the proper structure for operating. Micro and small enterprises usually start with a few products and suppliers, in an environment which is simple while they grow up. But...what happens with the medium-sized? They have more transactions with customers and suppliers, and have more workers than micro and small ones. How do their executive managers, area managers and operative workers perceive the environment? How is the structure designed in relation to the environment? Which is considered as the most important for structural design: complexity o stability?

Objective

The purpose of this paper is to determine, from the perception of the people working in different enterprises, what is considered for organizational structure designing: stability of complexity, as well as to verify if there is a relation between structural design and organizational performance.

Three variables were studied, which are independent among them:

- a) organizational structure performance
- b) environmental stability
- c) environmental complexity

Hypotheses

H1: When designing a structure, the Pearson correlation between structure and complexity is stronger than the one for structure and stability, which makes enterprises have larger structures but unable to adapt to the environment effectively.

H2: The better structurally designed an enterprise is, the better it performs.

H3: The more contact there is with the final clients or customers, the stronger correlation there is between structure performance and the environment dimensions.

Importance of the study

The correct perception of the environment would allow companies develop more accurate structures to adapt to it, enabling better decision making for sustainability, growth and business improvement in order to get competitiveness. It will help educational institutions to update the study programs related to enterprise design and organizational development, and students of management will be able to use what they have learned, for efficient problem solving in structure design in medium-sized enterprises.

Having stronger enterprises, flexible to adapt and eager to evolve, could help the country lower unemployment rates

and create more opportunities to newly graduates for professional development.

Limitations

The study was conducted in 23 medium-sized enterprises in Merida, Yucatan, Mexico, so the results can not be generalized. However, the methodology could be used in other contexts with the corresponding changes and will be the starting point for further studies. The data was gathered in the second semester of 2006.

Supportive literature

Organizational structure

According to Snow and Hrebreniak, cited by Hall (1983), all organizations depend from the environment, and the less predictable the conditions are, the more difficulties there could be for coordination (Litterer, 1979).

Structure and organizational performance are closely related to the environment (Litterer, 1979). Organizations must correspond to their environment to survive, as it was also stated by Lawrence and Lorsch (Hall, 1983). Daft (2005) indicates that organizations could choose between a traditional frame designed for efficiency, emphasizing vertical communication and control (strict tasks and hierarchy, many rules, reporting systems, few teams, little integration, and centralized decision making), or a contemporary organization scheme towards learning, focusing in communication, fewer rules, horizontal communication, some teamwork and decentralized decision making. For Hellriegel and Slocum (2004), the traditional ones are “mechanistic” and the contemporary ones are “organic”.

Robbins (2004) says that organizational structure defines how working tasks are divided, grouped and coordinated, according to six basic elements which must be considered for structure designing:

- a) Work specialization or work division: Refers to the degree in which tasks are divided in working roles or positions.
- b) Departmentalization: It is grouping the tasks to coordinate those which are common, either by function, geography, product, process or customer type.
- c) Chain of command: It is a continuous line of authority extended from the highest layer of the organization to the lowest position, specifying who to report and from who orders are received.
- d) Span of control: It refers to the number of subordinates a manager can efficiently and effectively direct.
- e) Centralization and decentralization: It concerns to the extent in which decisions are made in one part of the organization, exclusively to formal authority. In decentralized organizations, problem solving is faster and the staff gets involved in the process.
- f) Formalization: It is the degree in which tasks are standardized. When formalization is higher, there is less freedom for the staff to work.

For Daft (2005), when organizational structure does not fit the needs of the organization demanded by the environment, decision making delays or lacks quality and does not respond in an innovative way to a changing environment or there are many evident conflicts.

Environment

Organizations have a double dependence from the environment: they must find resources and allocate their products, whatsoever their nature. Technical, economical, social and cultural aspects are decisive factors for them because they are part of their environment, defined by Daft (2005) as all elements outside the organization boundaries and which have the potential to affect it as a whole or in part. Wheelen and Hunger (2007) indicate that researchers have discovered a positive relation between the environmental analysis and organizational performance.

Environment includes elements or groups with influence in the corporation and which receive influence from this, such as the government, employees, unions, competitors, suppliers and stakeholders in general. In his study, Hall (1983) established the following dimensions for the environment: (1) technological conditions; (2) legal; (3) political; (4) economical; (5) demographic; (6) ecological, and (7) cultural.

Uncertainty

The simple-complex dimension established by Duncan, cited by Daft (2005), understands environmental complexity as the heterogeneity or the number of differences among external elements which are of interest for the operations of an organization. The more external factors influence an organization, the more complex the environment is. In a simple environment there are a few external affecting.

On the other hand, several external factors cause turbulence and uncertainty due to the lack of information about environmental changes (figure 1). The more uncertainty there is, the more risk of failure organizations have because of the difficulty for estimating costs and the probabilities associated to decision making.

Hall (1983) says that the environment perceived in organizations corresponds, in a good sense, to the actual one they have, so the key factor is constituted by the perceptions and the resulting actions of them. As organizations select those environmental aspects with which they will deal, it could be said that they are building or inventing their environment.

For Daft (2005), organizations facing general uncertainty must have a horizontal (organic) structure to enhance communication and help them adapt to their environment. Once more, internal structure must correspond to the external environment. In addition, according to Ohmae (1988), as a

result of increasing uncertainty, planning becomes important because it could soften the impact of external changes. Customer orientation is the only way to ensure stability for an organization in the long run.

According to Kotter (2005), leadership and management are two different but complementary, action systems. Leadership is used for dealing with uncertainty and facing change, and management is for facing complexity. Without a good management, enterprises could become chaotic and put their existence at risk. Currently, in countries such as the United States, most of the corporations are managed in excess because they focus on complexity, but with a weak leadership to adapt to changes effectively.

MATERIALS AND METHODS

Study type and design

This study is descriptive-comparative, evolving to correlational, with a quantitative approach. The design is non-experimental because the researcher did not have influence in variable handling, only collecting the information (Hernandez, Fernandez and Baptista, 2003). The method was a field study and the technique used was the survey, with the corresponding instrument.

Sample

Executive managers, area managers and operative workers from 23 enterprises accepted to participate, resulting in 77 surveys. The distribution is presented in the table 1:

Figure 1: Duncan's environment / structure classification.

		Simple + Stable = Low uncertainty	Complex + Stable = Low-moderate uncertainty
Environmental change	Stable	<p><u>Environment:</u> Low number of external and similar elements. Those which remain continue equally or change slowly. For example: beer distributors, soft drink manufacturers and distributors.</p> <p><u>Structure:</u> Mechanistic structure, formal and centralized, with few departments. Not integrated roles. Everyday operations oriented.</p>	<p><u>Environment:</u> Great number of external and different elements. Those which remain are equal or change slowly: universities, electrical supplies manufacturers, insurance companies.</p> <p><u>Structure:</u> Formal and centralized structures, many departments, few integrating roles, some planning. Moderate speed of response.</p>
	Unstable	<p>Simple + unstable = High-moderate uncertainty</p> <p><u>Environment:</u> Small number of external and similar elements. Elements which change with frequency and unpredictably: e-commerce, fashion clothing, music industry, toy manufacturing.</p> <p><u>Structure:</u> Organic structure, team work, participation and decentralization. Few department and many links. Few integrating roles. Fast response to environmental change.</p>	<p>Complex + unstable = High uncertainty</p> <p><u>Environment:</u> Great number of different and external elements, changing fast and unpredictably: computers, spacecrafts, telecommunications, airlines.</p> <p><u>Structure:</u> Organic structure, team work, participation and decentralization. Many differentiated departments. There are several integrating roles and exhaustive planning is required, forecasting and immediate response.</p>
		Simple	Complex
Environmental complexity			

Source: Daft (2005)

Table 1: Participants

Activity	Executive managers	Area managers	Operative workers	Total
Manufacturing	5	9	6	20
Commerce	9	11	10	30
Service	9	11	7	27
Total	3	31	23	77

All enterprises are medium-sized according to the number of employees, as it was stated in the Mexican Federation Official Newspaper (2005): 51 to 250 for industrial businesses; 31 to 100 for commercial, and 51 to 100 for service companies. Executive managers include owners and general executive managers; area managers are the staff members in the middle of the organizations, and operative workers are those with direct contact with the production activities or with the general public, in case of commercial and service business units. The selection of area managers and operatives for this study was intentional, considering their experience in their position and the time spent in the company. However, the executive managers of all the participating enterprises had to be surveyed because of their relevant role in the organization.

Instruments

Two instruments were elaborated according to Duncan (Daft, 2005), both with a Likert scale: one for verifying the perception about structure performance (20 items), and another for the perception respecting both the stability (10 items) and complexity (10 items). Both were made considering the concepts in the supportive literature and are presented in the appendix at the end of this work. Validity was obtained by the judgment of three experts, and for reliability there was a pilot test with 10 executive managers, 10 area managers and 10 operative workers, obtaining the

following Cronbach's Alpha coefficients, which made the instrument be considered as reliable:

Table 2: Cronbach's Alpha for each instrument

Alpha	Structure	Stability	Complexity
Executive Managers	0.81	0.88	0.80
Area Managers	0.85	0.93	0.89
Operative workers	0.85	0.83	0.81

The first instrument was divided in two sections: the first 8 items referred to the basic structural elements cited by Robbins (2004) in the supportive literature: work specialization (1 item); departmentalization (1 item); chain of command (1 item); span of control (1 item); centralization-decentralization (2 items), and formalization (2 items). The 12 remaining items referred to aspects related to structure performance based on the horizontal coordination concept of Daft (2005): communication (1 items); labor environment (2 items); equity (1 item); motivation and reinforcement (2 items); human resource management (2 items); customer orientation (2 items), and planning (2 items). In instrument 1, the higher the score (5 is the maximum), the better the organizational structure is performing; in instrument 2, for the stability section, the higher the score, the more unstable (dynamic), and for complexity, a higher score (5 is maximum) denotes a more complex environment in the surveyed participants' perception.

Procedure

The surveys were held in the participants' business units, after explaining the academic purposes and granting confidentiality. Executive managers and area managers filled in their questionnaires themselves, but for operatives they were filled by the researcher when talking to them, as in an interview.

For Pearson’s correlation, Excel and SPSS, version 12.0 were used. The results were organized for a general view, then by position (executive managers, area managers and operative workers) and by activity (manufacturing, commerce and service). Finally, only executive managers’ perception, then area managers’, finishing with the operative workers’, to find differences among the groups. A correlation coefficient equal or above 0.8 is considered “strong”.

RESULTS

The highest perception regarding structural performance was for the manufacturers executive managers (4.18, table 5), followed by the area managers of service enterprises (4.16) and the executive managers of those enterprises (4.11, table 6). In fact, service enterprises got the best scores for structure performance (4.03, table 4). This could be due to the horizontal interaction (Wheelen and Hunger, 2007) and the contact with customers in general.

In the tables, (*) means “significant at the 0.05 level”, and (**) means “significant to 0.01 at the level),

Table 3: General results by position (Executive Manager, Area Manager and Operative Workers) regardless the activity.

Position	Correlations		Average according to the position		
	Stability	Complexity	Structure	Stability	Complexity
Executive managers	0.198	0.464*	4.03	3.78	3.76
Area manager	0.626*	0.612*	3.93	3.59	3.44
Operative workers	0.527*	0.506*	3.75	3.5	3.5
Average			3.91	3.62	3.56

Table 4: General results by activity, regardless the position

Activity	Correlations		Average according to the activity		
	Stability	Complexity	Structure	Stability	Complexity
Manufacturing	0.279	0.412	3.98	3.17	3.48
Commerce	0.578*	0.728**	3.79	3.34	3.46
Service	0.486*	0.303	4.03	3.89	3.74
Average			3.93	3.47	3.56

However, executive managers of service enterprises perceive a more unstable (dynamic) environment (4.14, table 5). Those who perceive a more stable one are the area managers of commercial enterprises (3.25, table 6) due to the seasons and the standardization of the products they sell.

Table 5: Executive Managers' perceptions

Executive managers	Correlations		Average: Executive Managers' perceptions		
	Stability	Complexity	Structure	Stability	Complexity
Manufacturing	0.044	0.566	4.18	3.76	3.39
Commerce	0.242	0.686	3.89	3.57	3.73
Service	0.015	0.217	4.11	4.14	4.01
Average			4.06	3.82	3.71

Table 6: Area Managers' perceptions

Area Manager	Correlations		Average: Area Managers' perceptions		
	Stability	Complexity	Structure	Stability	Complexity
Manufacturing	0.502	0.52	3.91	3.7	3.34
Commerce	0.646**	0.807**	3.79	3.25	3.42
Service	0.567	0.145	4.16	3.9	3.66
Average			3.95	3.62	3.47

Table 7: Operative workers' perception.

Correlations			Average: Operative workers' perceptions			
Operative workers	Stability	Comple xity	Struc ture	Stab ility	Comple xity	
Manufacturing	0.06	0.011	3.91	3.95	3.91	
Commerce	0.734**	0.742**	3.71	3.27	3.29	
Service	0.451	0.455	3.71	3.59	3.57	
			Avera ge	3.78	3.60	3.59

Environment was perceived as more complex by the executive managers of service enterprises (4.01, table 5), and less complex for operatives of commercial ones (3.29, table 7) because of the standardization of products and processes for selling. What is interesting is that operatives of manufacturing enterprises perceive the environment as more complex than what their executive managers and area managers do, which could be because the staff members are dedicated only to external aspects (imports, exports, purchasing and contact with authorities) and are far from the workers, who are affected by demographical and cultural affairs.

In general, for executive managers, structure-stability and structure-complexity correlations were low because they apparently assigned higher scores to structure performance, which means that, in their perception, their organizations are working very well, which does not necessarily corresponds to reality. However, they identified their environment as stable and complex. Apparently, they are not in direct contact with environmental changes. It was expected that, because of the nature of their position and orientation to strategic planning, the relation between the variables was stronger. Area managers showed a stronger correlation between variables than their executive managers (table 3), in special in

commercial enterprises (table 6), which could be due to the contact with customers and workers, being in contact with environmental changes.

For operatives in manufacturing and in service units, structure and environment do not fit, which led to a low correlation. For commercial operatives the correlation was almost strong (0.734 for stability and 0.742 for complexity, table 7).

In general, the correlation coefficients were higher for structure-complexity (0.544, table 8, with the maximum for commercial managers: 0.807, table 6, significant at the 0.01 level) than for structure-stability (0.507, table 8, with the maximum for commercial operatives: 0.734, table 7, significant at the 0.01 level).

Table 8: General results: all participants' perception regardless position or activity.

	Correlations		General average		
	Stability	Complexity	Structure	Stability	Complexity
Structure performance	0.507*	0.544*	3.91	3.62	3.55

CONCLUSIONS

From the correlation analysis, it is seen that for structure designing, the general environment perceived is unstable-complex (table 8), and even though the score is higher for stability (which really means “more unstable”) than for complexity, participants' perceptions resulted in a stronger correlation between structural performance and complexity, than between performance and stability. This results in larger structures but unable to respond quickly to meet market changes, product life cycles and customer expectations (Daft, 2005; Hall, 1983), constituting the answer to hypothesis H1. Enterprises are considering management

more than leadership, showing they are better prepared for complexity than for effective adaptation to the environment, matching what Kotter (2005) said about management vs. change facing. This means that executive managers must take in mind the effects of both stability and complexity in their strategic planning and operations according to the results presented, so their organizations could work in a more organic than mechanistic way.

For the answer to hypothesis H2, according to Wheelen and Hunger (2007), it is expected that for a better structural performance, there is a better organizational performance. The Pearson's coefficient between both parts of instrument 1 was 0.81 for executive managers, 0.9 for managers and 0.95 for operatives, which corresponds to what those authors stated because the correlations were strong.

Contact with customers, as it was seen in commercial and service enterprises, enhances a better correlation between structure and environment (Ohmae, 1988; Wheelen and Hunger, 2007), and those with less contact with their customers and staff (executive managers) had lower structure-environmental variable correlation. So, the more contact there is with final clients or customers, the better correlation results between structure performance and environmental dimensions, answering hypothesis H3.

Suggestions

It is suggested for all participants in an organization, from the executive managers to the operative workers, to be more in contact with customers, suppliers and authorities for being aware of environmental changes, and periodically revise their structure to be sure it corresponds to external influence. There must also be more interaction among the staff in general through meetings and working committees. An efficient use of informal communication existing in the organization must be achieved.

Training is also a good way for helping the staff update their knowledge about what is happening outside and inside the organization. Periodical evaluation for all positions is also a good way for feedback, allowing executive managers verify structure performance. A socio-economic approach would be useful because of the interaction among all participants in an organization and the win-win negotiation it enhances.

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Los trabajadores conocen sus productos y servicios

Todos los puestos tienen una razón de existir

La empresa se orienta hacia la satisfacción del usuario

Las actividades se planifican

Puntuación:

Observaciones (anotarlas al reverso de esta hoja)

English version of the scale and items:

Scale:

TA= Totally agree or excellently

A= Agree or adequately

N= Neutral

D= Disagree or deficient

TD= Totally disagree or absent

Items

Functions are correctly defined

There is a function manual

People are specialist in their work

Departments are correctly defined

Personnel know who they depend from and who to report

The number of people managed by every boss is adequate

Personnel develop their corresponding functions

Decisions are delegated to employees

Workers labor with confidence

There is adequate communication in the enterprise

Labor climate is nice

Personnel turnover is low

Personnel are on time for work

Personnel attend to work

Workers' initiative is rewarded

People are equally treated

Workers know their products and services

There is a reason to exist for every position

The enterprise is oriented to customer satisfaction

Activities are planned

Instrument 2: Perception about stability and complexity

Cuestionario	Percepción sobre la estabilidad y la complejidad
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Por favor, marque con una "X" la casilla que corresponda a la opinión que le pedimos, con lo que indicará hacia dónde tiende su respuesta. Los datos aquí contenidos son confidenciales. ¡Muchas gracias por colaborar!

Escala

TA= Totalmente de acuerdo o excelentemente

A= De acuerdo o adecuadamente

N= Neutral

D= En desacuerdo o deficientemente

TD= Totalmente en desacuerdo o inexistente

Gir

o:

Puesto:

Fecha:

	TA	A	N	D	TD
a) Estabilidad	5	4	3	2	1

El mercado requiere que nuestros productos y/o servicios cambien rápidamente					
Las expectativas del cliente son diferentes cada año.					
Existe gran número de clientes nuevos cada año					
Lo que está bien hoy tiene que cambiarse mañana					
Las cosas se hacen con urgencia					
Deben tomarse decisiones con rapidez					
Reaccionamos a los cambios más rápidamente que nuestros competidores					
Los problemas son solucionados rápidamente					
Se buscan formas nuevas para resolver problemas					
La empresa cuenta con un programa de capacitación eficaz					
Se actúa con respecto a las sugerencias de los clientes					
Hay constantes cambios en el ambiente que rodea a la empresa					

Puntaje (subtotal)

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Observaciones:

Environmental Stability or Complexity for Structure Designing?

	TA	A	N	D	TD
b) Complejidad	5	4	3	2	1

El número de proveedores es elevado					
La empresa tiene elevado número de clientes					
El número de transacciones diarias es elevado					
La variedad de productos y/o servicios que ofrecemos es amplia					
La empresa tiene muchos competidores					
El nivel de competencia es alto					
La empresa tiene relación con sindicatos y/u otras organizaciones externas					
Se maneja un gran número de productos diferentes					
Los trabajadores son muy demandantes					
La empresa está expuesta a muchas oportunidades y/o riesgos					
La empresa enfrenta crisis constantemente					
Los problemas se solucionan					

Puntaje (subtotal)

Observaciones:

English version of the scale and items

Scale:

TA= Totally agree or excellently

A= Agree or adequately

N= Neutral

D= Disagree or deficient

TD= Totally disagree or absent

Items

a) Stability

The market requires our products or services to change rapidly

Customer expectations are different every year

There are a great number of new customers every year

What is good today has to be changed tomorrow

Things are done with urgency

Decisions must be made rapidly

We react to changes faster than our competitors

Problems are solved rapidly

We look for new ways to solve problems

The enterprise has an efficient training program

Actions are taken respecting the customers' suggestions

There are constant changes in the environment surrounding the enterprise

b) Complexity

The number of suppliers is high

The enterprise has a high number of customers

The number of daily transactions is high

There is a wide variety of products and/or services we offer

The enterprise has many competitors

The competition level is high

Environmental Stability or Complexity for Structure Designing?

The enterprise has relation with unions and/or other external organizations

We handle a great number of different products

Workers are very demanding

The enterprise is exposed to many opportunities and / or risks

The enterprise is facing constant crisis

Problems are solved