

Organizational Structure and Accuracy of Performance Forecasting in Large Manufacturing Firms, In Kenya

¹E. W. Chindia, ²G. P. Pokhariyal

¹Graduate, School of Business, ²Prof, School of Mathematics
University of Nairobi, Kenya
ewc2811@gmail.com

Abstract: *This paper presents an integrative framework for understanding accuracy of performance forecasting (APF) developed from the roles of managers and their forecasting staff. The paper offers taxonomy of principal components in relation to organizational structure in the decision-making process for APF in large manufacturing firms (LMFs), in Kenya. Principal components extracted are identified, categorized and prioritized. The objective was to categorize and prioritize principal components of any type of organizational structure for management to focus on. APF is an aspect of operations management that is seldom derived correctly in many LMFs. Management can categorize and prioritize components of an organizational structure in order to ameliorate shortcomings brought about by the many structural elements, hence manage operations effectively for APF. The study identified the multiple dimensions of organizational structure in LMFs and by using factor analysis categorized them into smaller groups and prioritized same. Factor analysis was done after collecting data using a structured questionnaire administered among randomly selected LMFs. Results of the analysis indicated that dimensions of organizational structure can be condensed into three basic groups where the most important structural practices were: that tasks in LMFs' planning units were repetitive, specialists were employed and that lines of communication were clear. The second category of structural principal components indicated that jobs were highly standardized, power and decision-making decentralized and rules and procedures governed decisions. The third component showed that decisions were made by top managers, LMFs were effective in non-complex environments and there were few innovative ideas.*

Keywords: *Organizational Structure, Accuracy of Performance Forecasting, Operations Management, Large Manufacturing Firms.*

1. INTRODUCTION

An organization is a collection of selected people that is structured and managed to accomplish a need or to pursue a collective objective and is linked to an external environment, for example, a market or a habitat in the case of wildlife. While the management of an organization can be structured in many different ways depending on desired objectives, such as, line, staff or functional, line and staff, committee, divisional, project, matrix and hybrid organizational structures, each structure determines the modes in which the firm operates and performs. For example, a vertical structure typically has a hierarchical arrangement of lines of authority, communications, rights and duties of the organization. On the other hand, a flat organizational structure is one that has few or no levels of middle managers. This type of structure is typically found where employees are on an Employee Share Ownership Plan (ESOP) – these workers pretty much manage themselves through defined process steps.

In general, an organizational structure will depend on the organization's objectives, aspirations and strategy. In a centralized structure, the top layer of management will have most of the decision-making power and will have tight control over departments and divisions. In a decentralized structure, the decision making power is distributed and the departments and divisions may have different degrees of independence depending on the quality of management in those departments and divisions. Companies such as Kenya Breweries Ltd., Unilever Kenya, Cadbury's Kenya Ltd., et cetera, which sell multiple products may organize their structure for sales and marketing so that groups are divided according to each product and depending on geographical area as well. An organizational chart, which evolves from such an arrangement, illustrates the organizational structure. Depending on the complexity of the organization and competence of its managers, an organization can also have a combination of centralized and flat structures. The authors opine that an organizational structure is a systematic arrangement of interrelated and interdependent lines of authority with a fair share of

functions and authority for each individual manager within the structure. An organizational structure is also influenced by the culture and strategy of the organization and its skill base.

An organizational structure can therefore, be viewed as the lens or perspective through which employees see their organization and its environment. The structure defines how activities such as task allocation, coordination and supervision are directed towards the attainment of organizational goals and objectives. It determines how the roles, power and responsibilities are assigned, controlled, and coordinated, and how information flows between the different levels of management. The structure allows the expected allocation of responsibilities for different functions and processes to different entities such as the branch or division.

2. LITERATURE REVIEW

Organizational structure has been defined in various ways by different researchers. According to Thompson (1967), an organizational structure refers to an organization's internal pattern of relationships, authority, and communication. Child (1974), Ford and Slocum (1977) and Fry (1982) posit that the hierarchical dimensions of structure such as complexity, formalization and centralization have received more attention than any others. They observe that each of these dimensions is also the dominant characteristic of a well-known structural type. On his part, Robbins (2004) states that formalization refers to an organization where there are explicit job descriptions, lots of organizational rules, and clearly defined procedures covering work processes. On the other hand, Fredrickson (1986) noted that formalization has significant consequences for organizational members because it specifies how, where, and by whom tasks are to be performed. He also added that a high level of formalization has the benefit of eliminating role ambiguity, but it also limits members' decision-making discretion. Authors contend that formalization has the potential to impede open-mindedness, cross-fertilization and innovation as the organizational structure tends to be highly bureaucratic.

Complexity refers to the degree of differentiation that exists within an organization. Hall (1977) suggested that there are three potential sources of complexity - horizontal and vertical differentiation and spatial dispersion. Organizations with numerous levels, broad spans of control, and multiple geographic locations would be considered highly complex. While such a structure is often considered appropriate for firms that compete in highly differentiated environments, Lawrence and Lorsh (1967) contend that it is important to recognize that a high level of complexity makes it difficult to coordinate and control decision activities.

Centralization refers to the degree to which the right to make decisions and evaluate activities is concentrated (Fry and Slocum, 1984; Hall, 1977). A high level of centralization is considered the most obvious way to coordinate organization decision making, but it places significant cognitive demands on those managers who retain authority. In their study, Pugh et al (1968) concluded that there existed a negative relationship between an organization's size and its degree of centralization. On his part, Mintzberg (1979) noted that an individual does not have the cognitive capacity or information that is needed to understand all the decisions that face a complex organization. The results of these two studies inform the view of our study that organizational structures tend to get more complex, with more variables to consider, as organizations grow bigger, complex and more diversified.

Hall (1972) observes that organizational structure also manifests the strategic choices and institutional models of structure chosen by the organization. He adds that the structure of the organization also relates to the context in which it operates, such as organizational size, technology, internal culture and climate, the general business environment, and national cultural factors. Several studies conducted in the 1960s and 1970s mainly used empirical data from large organizations. These studies include: Pugh et al (1968) and Child (1972) all of whom focused on organizations with more than 1000 employees as the mean value. Hall (1972) focused on the structure of 75 organizations in different size classes (less than 100, 100-999, 1000 and more employees). The general conclusion from the studies was that larger organizations tended to be more complex and more formalized than smaller organizations, but this relationship proved only to be strong for a few variables namely, specialists are employed, rules and procedures govern decisions and decisions are made by top managers.

Structurally, division of work causes a decrease in the proportion of superiors when the firm size reaches a certain level. When this level is reached, another way to co-ordinate and control activities/functions may be needed. The way structural factors relate to firm size seems to be less clear

for small firms than for large firms. However, the conclusion that there is a positive relationship between size and complexity seems to hold true for both small and large firms (Barth, 1999). As mentioned earlier, organizational structure also relates to internal and external technological factors. In his study, Galbraith (1982) noted that innovative small firms risk more failure than those functional-based as their task is more uncertain. He concludes that organizations that perform innovative tasks need different structures from those organizations with little innovation. The researcher posits that, to be a consistently innovative firm, there must be both innovative and operational parts within the firm and the organizational structure must facilitate the transfer of ideas between the two parts.

According to Zahra (1993) entrepreneurial activities focusing on organizational structure are less visible to the competition, thus providing sustainable competitive advantage to the firm. He also points out that organizational innovation should be examined as an indicator of entrepreneurship. In their research, Miller and Toulouse (1986) concluded that a proper innovation-oriented organization should delegate authority for decision-making and hire professional managers. Since delegation of authority creates different goals among managers, these authors also observe that interdepartmental relations should be enhanced within the organizational structure. This recommendation is specially addressed to small firms because the needs mentioned above are higher in growing firms with swift structural changes. Empirical data provided by Miller and Toulouse (1986) support these statements. Economic performance measures were better among firms that followed their postulates. Although the classic bureaucratic structure may be the form of choice in a stable environment with low complexity, research has shown that rapid change and increased complexity require greater lateral mechanisms and a more organic form (Galbraith 1973, 1994; Burns and Stalker 1961; Hall 1962). In all these studies, researchers have not demonstrated the impact of the different structural modes on APF.

3. HYPOTHESIS

In this study, the hypothesis tested was that dimensions of organizational structure in large manufacturing firms, in Kenya, can be categorized and prioritized, using factor analysis, to a few principal components in order to achieve accuracy of performance forecasting.

4. PROBLEM OF RESEARCH

Forecasting in large manufacturing firms is the establishment of future expectations by the formation of opinions or use of past data. While forecasting has become a challenging concept in the study of enterprises, Ansoff (1987), Vorhies and Morgan (2005) state that since the environment is constantly changing, it is imperative for organizations to continually adapt their activities in order to succeed. With rapid and often unpredictable changes in economic and market conditions, managers make decisions without knowing what will exactly happen in future. The various dimensions of organizational structure can either enhance or reduce effective organizational performance resulting in either accuracy of performance forecasting or deviations between forecasts and actual outcomes. This study therefore, addressed the question: Can the multiple dimensions of organizational structure in LMFs, in Kenya, be categorized and prioritized in order to yield accuracy of performance forecasting?

5. METHODOLOGY OF RESEARCH

The study was a descriptive cross-sectional survey using the positivist research philosophy.

5.1. Sample of Research

The sample frame comprised 487 large - with at least 100 employees each (Gray et al., 1997) - manufacturing firms, in Kenya, Sample size was calculated using a table by Krejcie et al. (1970) which resulted in 217 firms to be surveyed having been selected using a proportionate stratified random sampling (PSRS) technique. Each target firm in a sector and geographical location was selected using a simple random sampling (SRS) technique (Sekaran, 1992).

5.2. Instrument and Procedures

The study used both primary and secondary data obtained from the target sample through a structured questionnaire that was hand-delivered to the selected teams of managers within the 217 respondent firms. Responses were received from 176 LMFs, that is, 81 per cent response rate was achieved. Prior to administering the research instrument, the instrument had been piloted on ten LMFs to help in

identifying any ambiguous and unclear questions. Respondents were assured of a high degree of confidentiality and anonymity of the responses.

Data collection included respondents either completing the questionnaires on their own or in the presence of the researcher, in their respective locations. Primary data included elements of organizational structure practiced in the different LMFs and secondary data involved collecting existing performance data from published and unpublished reports over a period of one year. These metrics addressed the objective of the study.

5.3. Data Analysis

The data was subjected to Factor analysis, which was used to reduce a set of variables on organizational structure to a smaller number of factors which were categorized and prioritized and could be easily interpreted and used across LMFs. To achieve this, a linear transformation on the factor solution – orthogonal rotation – was done resulting in fewer uncorrelated components.

6. RESULTS

Literature review indicated that organizational structure referred to an organization’s internal pattern of relationships, authority, and communication. In examining the role of organizational structure as a factor in forecasting in LMFs the analysis provided findings, where the Kaiser-Meyer-Olkin (KMO) measure of sampling accuracy value was statistically significant with a p-value of 0.000, where the theoretical p-value is less than 0.05, see Table 1.

Table1. Organizational Structure - Kaiser-Mayer-Olkin and Bartlett’s Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.509
Bartlett's Test of Sphericity	Approx. Chi-Square	197.424
	Df	36
	Sig.	0.000

Table 2 below illustrated that the principal components extracted in relation to organizational structure were in three categories. In category one, the most important structural variables were that tasks in LMFs planning units were repetitive, specialists were employed and that lines of communication were clear - with a factor loading of 2.064. The second category of principal components extracted indicated that within LMFs jobs were highly standardized, power and decision making decentralized and rules and procedures governed decisions - with a total factor loading of 2.086. The third component showed that decisions were made by top managers, LMFs were effective in non-complex environments and there were few innovative ideas - with a total factor loading of 1.911.

Table2. Organizational Structure - Factor Reduction

Component	Factor Description	Factor Loadings	Priority
1	(i) Specialists are employed	0.801	1
	(ii) Lines of communication are clear	0.759	2
	(iii) Tasks are repetitive	0.504	3
2	(i) Jobs are highly standardized	0.813	1
	(ii) Power and decision making are decentralized	0.672	2
	(iii) Rules and procedures govern decisions	0.601	3
3	(i) There are few innovative ideas	0.831	1
	(ii) Decisions are made by top managers	0.664	2
	(iii) LMFs are effective in non-complex environment	0.416	3
a. Extraction Method: Principal Component Analysis.			
b. Rotation Method: Varimax with Kaiser Normalization.			
c. Rotation converged in 4 iterations.			

Principal components analysis revealed the presence of three components with eigenvalues exceeding 1, explaining 18 percent, 17 percent and 14 percent of the variance respectively. The three principal components therefore, explain 49 percent of the variance. The remaining 51 percent of the variance could, possibly, be due to factors outside the scope of this research. The factor descriptions within each of the three principal components are also categorized and prioritized, where in principal component one employing specialists is considered most important in ensuring accuracy of performance forecasting.

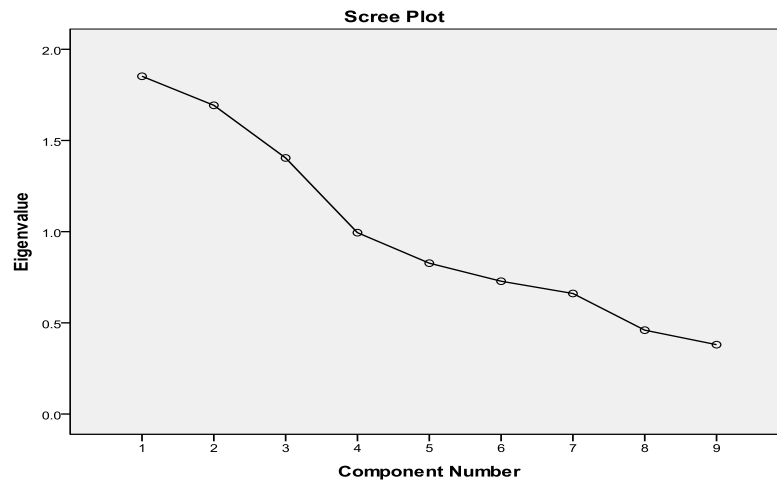


Fig1. Organizational Structure - Principal Components Analysis

7. DISCUSSION

According to Mintzberg (1979), most organizations can be divided into 5 basic parts: Apex, middle line, operating core, techno-structure and support staff. The apex, middle line and operating core form the line positions. Techno-structure consists of analysts who take the job of figuring out what the company's procedures should be and the mission of this structure is to effect coordination through standardization. On the other hand, support staff forms the administration units that provide services to the company, such as cafeteria, mailroom, legal, public relations, among others. Mintzberg concludes that as the company grows even larger, one manager cannot handle all the workers, and so there are multiple managers of workers, plus a manager to manage the managers. This creates a middle line which transmits authority from the top to the bottom.

Studies by Pugh et al (1968), Child (1972), Hall (1972) and Mintzberg (1979) were conducted in developed economies and consistently depicted Mintzberg's organizational structure, specifically where specialists were employed, rules and procedures governed decisions and decisions were made by top managers. The studies had smaller sample sizes of varying employee numbers - less than 100 to over 1000 employees. Our study, conducted in a developing economy, had a sample size of 217 firms with 100 or more employees. In this study, several other variables were introduced and merged with those of prior studies, see Table 2. Our study supports the view that, as organizations grow bigger and more complex, the level of organizational structure changes in tandem. We also opine that the complexity and reach of organizations through expansions into other non-traditional markets/regions with different cultural practices and strategies - both culture and strategy tend to influence organizational structure – organizational structures change concomitantly from Mintzberg's model. Further, the current practice of outsourcing certain services offered by the techno-structure, support staff and, to some extent, middle line staff, and the clamor for multi-tasking, must change the structural arrangement of several large firms from the Mintzberg model.

For future research, it would be interesting to review Mintzberg's organizational structure for small, medium and large organizations that have ventured beyond their traditional markets and provide structural models for present-day organizations in view of the changed dynamics in managing organizations, taking into account multi-tasking, outsourcing practices and the different cultures and strategies in existence in emerging markets to discern any improvements or otherwise in accuracy of performance forecasting.

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