Mathematical Pattern for Predicting Productivity of Managers Based on Organizational Climate

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Abstract

The purpose of the present research is to investigate the relationship between organizational climate and the productivity of managers to present a suitable management pattern for productivity based on organizational climate. Out of the population of the research, 1208 managers were randomly selected consisting of managers who work in high schools (N=245), Municipality (N=52), National Company Petrochemical Industries (N=349), Islamic Azad University, Zone 8 (N=200), Tax offices (N=208), and Charity organizations (N=154) in Tehran Province. The research instruments were the questionnaires of organizational climate (Litwin & Stringer, 1968) and productivity (Smith, McCall, & Stoll, 1998). To this end, questionnaires were given to three clerks under each manager's supervision. The results of applying the analysis of multi-variation regression indicated that: 1) there was a relationship between the organizational climate and the productivity of the managers and 2) the math pattern for the productivity of the managers in educational, public services, industrial, higher education, tax, and charity organizations based on organizational climate were as follows:

1) Productivity = 0.64 × organizational climate + (-22.62)
2) Productivity = 0.73 × organizational climate + (-15.825)
3) Productivity = 0.65 × organizational climate + (-29.19)
4) Productivity = 0.85 × organizational climate + (-11.219)
5) Productivity = 0.66 × organizational climate + (-10.04)
6) Productivity = 0.63 × organizational climate + (-15.74)

Keywords: pattern, productivity, organizational climate

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Introduction

Tendency toward completeness is one of the human being's characteristics, and it has been considered as the most important factor which has made him progress in the history of his lifetime. Productivity is also one of the indexes of achieving completeness in manmade systems and human being's intentional activities. From the very beginning, the origin of attempt to promote productivity has been the human being's nature which has tendency toward completeness, and nowadays, regarding the increasing shortage of resources as well as increasing competitiveness in world economy, it is necessary to promote productivity in all aspects of life. Different countries try continuously to increase their national, industrial, commercial, and educational productivity levels. They make attempt to promote their productivity by applying different management methods. Managers have an important role in increasing productivity.

Drucker (1954) believes that managers are the most valuable as well as the rarest resource of any organization. They are the main and determinant factors in each society who have vital and fundamental role in flourishing of that society. Using their internal capabilities, specialized knowledge, and professional experiences, the qualified, aware managers are able to achieve the organization goals while they apply the minimum amount of resources and increase the organization efficiency and effectiveness. Doubtlessly, management is an important factor in flourishing and the key to prosperity, welfare, and independence of nations; nevertheless, prosperity depends on organizational, group activities, and in turn, achieving the organizational, group activities require effective management. In the world of competition and the increasing complexity of skills, the success of

organizations may see impossible if they do not apply favorite methods of management. Hersey and Blanchard (1988) believe that the role of the manager or leader of an organization is significant because he confronts all environmental variables which are around him. Managers should enjoy eminent characteristics and utilize studies and research findings related to management in order to apply suitable methods regarding the organization situation. They should also provide a favorite organizational climate in order to pave the way for achieve the organization goals.

Literature Review

According to French, Kast, and Rosenzwieg (1985) the organizational climate of a collection has a direct and steady relation with the perception of the organization members about its cultural features. This perception affects the people's feeling, attitude, and behavior in their workplace. Boulden (1992) also believes that the organizational climate is an environment in which people work and it is a reflection of staff attitude and the style of organization management. The organizational climate consists of a system of value which defines what the method of doing something is and which behaviors are acceptable. According to Schneider (1990) the organizational climate has been broadly defined as the common perception of policies, activities, and organizational procedures either formal or informal which members can observe them. According to Owens (1991) the concepts of both organizational culture and organizational climate are structures which deal with the same fact, and the people's behavior in organizations is not the result of interaction with the direct and tangible event, but it is the result of interaction with the intangible powers in the environment.

Boone and Kurtz (1991) believe that organizational culture relates to nature, beliefs, and expectations of organizational life, while organizational climate is an index for defining and achieving these beliefs and expectations. Chandan (1995) states that organizational climate reflects the people's attitude toward the organization that they are interested in, and it is a collection of features and factors considered as the main force that is effective in defining the staff's behavior. Koene (1996) believes that organizational climate mostly depends on the description of work atmosphere as the members of the organizations understand it. The work atmosphere measures can be considered as environment assessment by the staff. On the other hand, organizational culture is considered as the description of the staff's behavioral preferences. In other words, the researcher who work in the field of organizational culture are not interested in what the people think about, but they look for devices which affect the perception, motivation and performance of the whole members of the organization. As examples, power distance (an aspect of organizational culture), and aloofness (an aspect of organizational climate) can be mentioned. The first one illustrates the tendency and normalities of a person toward the acceptance of misbalance of power, and the second one refers to the staff's perception of a boss who is aloof. Denison (1996) believes that organizational climate has two distinct concepts; one is the people's common reflection or perception of a situation. Therefore, it may pose the atmosphere of satisfaction, resistance, conflict, or... The other one is the whole condition which affects the people's behavior. The objective features of a social system are along with its reflections which are consistent with those features.

The organization size is among the effective structural factors which affect organizational climate. The results of a study show that in smaller organizations,

there is a more open and truthful environment as well as a friendly organizational climate. In addition, the professional status of an individual in the organizational hierarchy can affect his perception of organizational climate (e.g. Steers, 1977; Sofianos, 2005; Erbisch, 2004; Fouts, 2004). The study carried out by Burns and Stalker (1961) shows that the repetitive technology like production line causes a kind of organizational climate which is inflexible rule based; therefore, the staff innovation noticeably decreases. There is little information about the effect of the organization external environment on its internal environment. Nevertheless, the environmental changes can affect organizational climate. For example, in economical conditions, the organizations may have to fire some of the staff, and this makes the staff feel that the organizational climate is threatening and not supportive (Ekrami, 2005). There are a lot of studies (Seraj, 2005; Karami, 2005; Wilson, 2005; Durcikova, Galletta & Butler, 2004; Lambert, 2004; Fouts, 2004; DeMeritt, 2005; Jackson-Malik, 2005) which confirm the effect of management policies and activities on organizational climate. For instance, it has been known that the following factors cause staff to take responsibility in achieving the group and organization goals: presenting feedback to the staff, individual independence, job identification, paying attention to environmental changes in the work place, fixing staff in suitable posts, salary, relation, reward, and encouragement.

Cherrington (1989) believes that the factors affecting organizational climate include management values, leadership style, economical situation, organizational structure, staff characteristics, forming unions, organization size, and work nature. According to French et al. (1985) available theories and the results of studies which have been done, are not enough for introducing the best organizational climate.

Litwin and Stringer (1968) stated that it is meaningless to tell the manager how to manage things. The manager chooses a climate that is necessary for highly favorable performance. The manager first gathers the related information (about the gap between the favorable climate and the present climate in his unit), then he chooses the programs and operations needed for reaching such a climate. Steers (1977) believes that if the organization goal is to achieve favorable feedback and performance, the climate that is tending toward success will be more suitable; while if the organization wants to satisfy its staff, a friendly climate will mostly suit it. The results of a study done by Timm and Peterson (1986) shows that there are factors like trust, shared decision making, listening to the reports made by high level people, and attending to the high performance goals in a strong organizational climate .

In a study, Halpin and Croft (1963) identified six kinds of organizational climate which are on a continuum. Moran and Volkwein (1992) quotes these as follows: open, closed, autonomous, controlled, paternal, and familiar. In the field of searching and investigating organizational climate, Likert also has presented the diagram of organizational characteristics called "profile of organizational characteristics" (POC) which contains eight dimensions of the fundamental characteristics of an organization. Regarding his theory of the four management systems, these dimensions consist of leadership process, motivating forces, relation process, and penetration-interaction process, decision making process, the order of goals, the process of supervision and achieving educational goals (Gibson, Ivancevich, and Donnelly, 1973). In addition, Stern and Steinhoff have presented another formulation of organizational climate (Steers & Porter, 1979). Stern like Halpin believed that the human personality can be compared to the personality of an

organization. He, based on the studies of Henry A. Murray, a psychologist, took the concept of "need-press" as a factor which forms the human personality. Murray believed that the personality is the result of dynamic interaction between (internal) need and press (Owens, 1991).

After carrying out a lot researches in the field of organizational climate, Litwin and Stringer (1968) compiled a fifty-item questionnaire which contain dimensions like structure, responsibility, reward, risk taking, warmth, support, conflict, standard, and identity. Litwin and Stringer have showed that the leadership style is among the factors that affect organizational climate. In addition to this, there are stable evidences of the relationship between organizational climate and other factors like emotional intelligence (Rogers, 2005), organizational learning (Jimenez, 2004), and job satisfaction (Stevens, 2005). Therefore, in order to fully achieve the organizational goals, the managers should supervise the organizational climate and create a suitable work environment to increase the productivity of the organizations.

The word "productivity" was posed by Quesnay for the first time in 1776 (Sumanth, 1998). In 1776, Adam Smith mentioned his ideas about work productivity, assigning of work tasks and specialty for profit rise, reducing tiredness, growing use of technology (Nayudamma, 1980). Regarding the concept of productivity, Smith refers to efficiency and specialty and believes that work should be assigned based on the people's efficiency and productivity. Economists like Sinver defined productivity based on the worker's physical, mental, rational and intelligent quality as well as his physical and mental power and skill. But the revolution in productivity has been done by Taylor from 1881 which can be considered as the history of formal and scientific studies about the productivity

management (Taylor, 1947). In 19th century, Litter defined productivity as the power of production (Sumanth, 1998). Mahoney (1988) believes that productivity includes efficiency, effectiveness, and change. In addition, scientists like Mescon, Albert, and Khedouri (1986), Boone and Kurtz (1991), Monga (1997), Robbins (1991), Ranftl (1989), Koontz, O'Donnell, and Weihrich (1986), Stoner and Freeman (1992), Schermerhorn (1989), and Landel (1986) believe that productivity includes efficiency and effectiveness of performance, and increase in the productivity level in an organization is the result of the efficiency of management which equals good management.

The main goal of management is to increase productivity and keep its growth. In fact, the basis of productivity management is to create a suitable condition for higher level of performance. The process of productivity management indicates the existence of change, and change does not occur easily. You can not order for some change. In the process of change, you should provide organization with necessary background. You should also identify the obstacles which confront the change, and do the necessary things to overcome them. Finally, you should fully identify what you are looking for, and vigorously supervise and handle the change continually (Belcher, 1987).

Wright (1989) summarizes the obstacle which exists in the route of reaching productivity as follows: lack of direction, weak organizational structures, the systems of payment and management. In other words, the management of productivity is the programming process, coordinating and monitoring the productivity program in the organization. A productive manager is a person who takes responsibility for doing important tasks (Lam & Ngee, 1987). Kopelman

(1986) considers environment, the features of the organization, work characteristics, and individual characteristics as the four main factors which affect productivity.

Studies show that productivity has meaningful relationship with the factors that follow: the styles of leadership and supervision (Foroutan, 2005; Akbari, 2005; Engle, 2004; Poxes, 2004), the quality of work life (Karimvand, 2004), managers' education (Zamani, 2004), observing the principles of human relations (Chenari, 2004), emphasizing on team work (Chiu, 2005), managers' thought styles (analytic) (Rahmati, 2005), organizational climate (Barari, 2005), managers' entrepreneurship (Hosseinzadeh, 2005).

Ross (1977) also believes that the productivity of an organization depends on resources, and management duties. He also states that making the staff to apply their abilities and capabilities leads to a higher level of organizational productivity and in turn to job satisfaction. Managing human resources and management performances related to job designing, job enrichment and flourishing, job circulation and shifting affect the staff's level of productivity. French (1986) believes that the success and survival of organizations depend on the managers' attention to the internal (organizational) and external environments and outcome (results). These factors affect each other. For instance, when the organization management strengthens and supports educational programs (an internal factor), it affects the legal disciplines of employment (an external factor). As another example, the effectiveness of the organization (outcome) affects the quality and reasonable price of its products, and increases the demand for that product (an external factor). "The International Organization of Work" has divided the factors which affect the organization productivity into two main groups:

A. External factors (uncontrollable): Those factors which affect the organization from outside and they are not under the control of people or managers of that organization. In order to improve the performance of the organization, the external factors affecting the organization management and efficiency should be pinpointed and the organization should adapt itself to the changes of these external changes. These factors include financial rules and regulations, international politics, tax rules and statements, political, economical and social relations and factors.

B. Internal factors (controllable): These factors are under the control of people and managers of the organization. They can be used to promote the productivity of the organization if the contemplative managers apply them correctly (Prokopenko, 1992).

In his investigations, Sumanth (1998) has found seventy different ways by which managers can promote the productivity of organization. These ways have been classified as five main groups based on technology, human resources, product, work (process), and material. This classification includes all ways based on the engineering of traditional industry, market (buying and selling), controlling systems, research on operation, computer engineering, management, psychology, behavioral sciences, and so on.

The purpose of the present study is to find whether there is a significant relationship between the organizational climate and the managers' productivity. The second concern of the study is to find whether there is a mathematical pattern for predicting the managers' productivity in educational, public service industrial, higher education, tax and charity organizations based on the organizational climate.

Methodology

Participants

The population of the study includes headmasters of all high schools in 20 Zones of Tehran city, the managers of different official departments in municipalities of eastern Tehran province (including 5 towns), the managers of National Company of Petrochemical Industries (including 14 companies), the Management of Development, managers of different sectors in Islamic Azad University, Zone 8 (including 19 branches), Tax managers of Tehran province (including 24 towns), Charity managers of Tehran province (including 10 towns). Based on the nature of research, it is necessary to ask for each manager's three staffs or teachers should give their comments about the organizational climate and the productivity of the managers' services.

Out of these, 245 high school headmasters, 52 managers of municipalities, 349 managers of National Company of Petrochemical Industries, 200 managers of Islamic Azad University, 208 managers of tax organizations and 154 managers of charity organizations were randomly selected and calculated using the following formula: n=$\dfrac{z^2(\delta^2)}{d^2}$. The research sample was based on the managers' population, but since three employees under each manager's supervision were supposed to answer the questionnaires, the total number of sample group amounted to 3624. In other words, the whole sample was as follows: [(245+ 52 + 349 + 200+208+154) ×3] =3624

Instrument

The questionnaire of organizational climate designed by Litwin and Stringer which includes 50 items with four options [the questionnaire has nine dimensions: structure, responsibility, reward, support, risk taking, warmth, standard, conflict, and identity], and the questionnaire of the productivity of managers' services designed by Smith, Stole, and McCall which includes 17 items with 5 options (all items assess the productivity factor and refer to the efficiency and effectiveness of the managers' performance). To remove the probable ambiguities and problems, the questionnaires were distributed randomly among some members of the sample group. The coefficients of Cronbach's Alpha were 0.76, 0.97, 0.89, 0.71, 0.77 and 0.77 respectively among the educational, public services, industrial, higher education, tax, and charity organizations for organizational climate. The indexes for productivity of managers' services were 0.95, 0.88, 0.94, 0.88, 0.81 and 0.89.

Design and Procedure

The study is a descriptive research and a correlational type in nature since it seeks to investigate the likely relationship between organizational climate and the productivity of managers to introduce a suitable management pattern for productivity based on organizational climate.

To collect data, two questionnaires of organizational climate and productivity of managers' services were administered to 3624 employees in different public and private sector organizations. Then, the collected data were classified and tabulated and finally analyzed using SPSS software.

Results

In the present study, to answer the research questions, the Pearson's Correlation Coefficient, and Linear Multi-Variation Regression have been applied.

The standardized coefficients (β_i) obtained from applying Linear Multi-Variation Regression to show the effect of the nine factors of organizational climate in the productivity of the managers' services in Educational, Industrial, Public Services, Higher Education, Tax and Charity Organizations are shown in Table 1.

Table 1
Standardized Indexes (β_i) in Educational, Public Services, Industrial, Higher Education, Tax and Charity Organizations

Educational Organizations		Public Services Organizations		Industrial Organizations		H. E. Organizations		Tax Organizations		Charity Organization	
Dimen.	(β_i) (%)	Dimen.	(β_i) (%)	Dimen.	(β_i) (%)	Dimen.	(β_i) (%)	Dimen.	(β_i) (%)	Dimen.	(β_i) (%)
warmth	21	structure	23	support	21	structure	38	reward	23	structure	13
reward	22	risk taking	13	reward	17	reward	21	risk taking	14	risk taking	16
identity	28	conflict	30	warmth	16.7	warmth	21	warmth	11	warmth	26
conflict	18	responsibility	11	Identity	15	standard	19	support	20	identity	17
risk taking	12			standards	14.7			standards	15		
support	12			conflict	6			conflict	11		
				risk taking	5.1			identity	11		
				responsibility	3.7						
				structure	0.8						

The followings are the results of applying some tests and data analysis:

There is a significant relationship between the organizational climate and the productivity of the managers' services.

In the proposed pattern, the dimensions of identity, reward, warmth, conflict, support, and risk taking in Educational Organizations, the dimensions of structure, risk taking, conflict, and responsibility in the Public Services Organizations, the dimensions of support, reward, warmth, identity, standard, conflict, risk taking, responsibility, and structure in the Industrial Organizations, the dimensions of structure, reward, warmth and standards in the Higher Education Institutions, the

dimensions of reward, risk taking, warmth, support, standards, conflict and identity in the Tax Organizations and the dimensions of structure, risk taking, warmth and identity in the Charity Organizations are factors which are effective in increasing the productivity of the managers' services.

In order to predict the productivity of the managers' services, by considering the organizational climate of the work environments, using the Linear Multi-Variation Regression in Educational, Public Services, Industrial, Higher Education and Tax Organizations as well as Charity Organizations, the following formulas can be used:

1) Productivity = $0.64 \times$ organizational climate + (-22.62)

2) Productivity = $0.73 \times$ organizational climate + (-15.825)

3) Productivity = $0.65 \times$ organizational climate + (-29.19)

4) Productivity = $0.85 \times$ organizational climate + (-11.219)

5) Productivity = $0.66 \times$ organizational climate + (-10.04)

6) Productivity = $0.63 \times$ organizational climate + (-15.74)

In addition, the productivity of the managers' services can be calculated based on the effective variables on organizational climate for Educational, Public Services, Industrial, Higher, Tax and Charity Education Organizations using the following formulas respectively:

1) Productivity= $0.22 \times$ warmth + $0.23 \times$ reward + $0.28 \times$ identity + $0.18 \times$ conflict + $0.12 \times$ risk taking + $0.13 \times$ support + (-6. 345)

2) Productivity= $0.23 \times$ structure + $0.13 \times$ risk taking + $0. 30 \times$ conflict + $0.11 \times$ responsibility + (-19.91)

3) Productivity= $0.21 \times$ support + $0.17 \times$ reward + $0.17 \times$ warmth + $0.15 \times$ identity + $0.15 \times$ standard + $0.06 \times$ conflict + $0.05 \times$ risk taking + $0.04 \times$ responsibility + $0.008 \times$ structure+ (-18. 30)

4) Productivity = $0.38 \times$ structure + $0.21 \times$ reward + $0.21 \times$ warmth + $0.19 \times$ standard + (-4.784).

5) Productivity= $0.23 \times$ reward+ $0.14 \times$ risk taking + $0.11 \times$ warmth + $0.20 \times$ support + $0.15 \times$ standards + $0.11 \times$ conflict + $0.11 \times$ identity + (-2/95)

6) Productivity= $0.13 \times$ structure + $0.16 \times$ risk taking + $0.26 \times$ identity + $0.17 \times$ warmth + (-3/24)

Discussion and Conclusions

Promoting productivity and protecting its growth is one of the managements' main goals. In fact, the basis of the productivity management is to provide suitable condition for acquiring the highest performance. The process of productivity management basically contains change, and change can never be done easily. In order to achieve desired changes, the needed background should be provided, and the organization should experience some serious variations. In addition, the management ought to recognize and cope with the factors that are against these desired changes.

Regarding the subject under investigation, and the factor of organizational climate in explaining the managers' productivity, the obtained results show that there is a significant relationship between organizational climate and the productivity of the managers' services in different centers. As French et al. (1985), Boulden (1992), and Schneider (1990) show that organizational climate depends on

the organization members' perception of the characteristics of the organization culture and the staff's attitude toward it, and it can emphasize the effect of this important factor on the productivity promotion. However, the results of the studies done by Burns and Stalker (1961) show the effect of the organizational climate which has tendency toward rules and is not flexible on the reduction of innovation in the staff's performance. While, the existence of a friendly atmosphere (Steers, 1977) and the prominence of factors like trust, shared decision making, support, the willingness of top staff to have relationship with the staff under their supervision, listening to the reports from the high rank people, and considering the goals of high performance (Timm & Peterson, 1986) can lead to job satisfaction and improvement in the staff's performance which ultimately lead to productivity promotion. Therefore, the findings of the present study are in agreement with the results obtained from the aforementioned studies.

Furthermore, Findings of the present study are in agreement with other studies concerning the components of organizational climate and their effects on the level of productivity; the results of studies about the dimensions like leadership style (Seraj, 2005; DeMeritt, 2005); The dimensions of structure, risk taking, conflict, responsibility (Barari, 2005); trust, respect, and less worry about creating relationship (Erbisch, 2004); salary, reward and appreciation, assessing tools for performance, relationship, structure, and leadership style (Fouts, 2004; Poxes, 2004; Karimvand, 2004; Chenari, 2004; Akbari, 2005). On the whole, the results of the present study and other studies show that productivity has a high correlation with the factor of organizational climate and its related components.

Regarding the results of this study, and recognition of the factors which are related to productivity of the managers' services in educational and industrial centers as well as municipalities, it is concluded that the factors which can be effective in achieving the highest productivity are as follows: the existence of a suitable organizational climate in which there are cooperation and assistance among managers and other employees, their bilateral support, trust creation, helping employees do their tasks, offering suitable rewards based on the services provided, the appreciation of suitable jobs, ignoring the mistakes that employee do not make on purpose, creating a friendly relationship, acceptance of criticism, encouraging employees to express their ideas.

Additional to that, It can be suggested that, based on present research (Table 1) various Educational, Public Services, Industrial, Higher Education, Tax and Charity Organizations by application of various factors effecting organizational climate in ration of increasing productivity with identification of various other factors which will have a connection with productivity factors and it is for increasing better productivity.

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