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## A Study of Fayol's Principles: Applicability in Today's Organization

Rinku Mahindru,<sup>1</sup> Abhilasha Sharma,<sup>2</sup> Suruchi Chopra<sup>3</sup> and Shruti Bhatia<sup>4</sup>

<sup>1</sup>Assistant Professor, <sup>2,3,4</sup>M.Com. Students, Department of Commerce, Faculty of Commerce and Business, Delhi School of Economics, University of Delhi, India. [rinkuwadhawan@gmail.com](mailto:rinkuwadhawan@gmail.com)

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### ABSTRACT

In contrast to the other management theories postulated around the same time, the Fayol model still closely resembles the cotemporary management thinking and practices. Many researchers believe that Fayol principles have stood the test of time owing to the inherent adaptability and flexibility. Brodie (1967) argued that the word "principles" should not be interpreted too restrictively. "It is a case of setting it going, starting a general discussion-that is what I am trying to do by publishing this survey, and I hope that a theory will emanate from it." (Fayol, 1949). Fayol intended to start a debate, which he hoped will converge into a concrete theory of management sometime in the future. He also emphasized that the number of principles accentuated in his study were arbitrary and non-exhaustive. (Brodie, 1967, Fayol, 1949). Thus, it is considered appropriate to use his observations for further exploration and research with respect to contemporary organizations. Basing our study on the fourteen principles of management propounded by Henry Fayol, we aim to test the degree of their applicability in today's organizations. A sample of 179 people was taken cutting across different sectors. A Likert scale was used wherein the employees were asked to rank their perceived degree of application of each principle. Further, we performed an exploratory factor analysis to test for the presence of latent factors in the observed variables. The three resultant factors were identified as 'Operations', 'Human Resource' and 'Line and Extent of Authority'. The analysis was subsequently utilized to test for any significant differences in the perceived applicability of variables loaded on each factor based on gender, sector and industry. The testing of hypothesis was done using parametric tests such as Independent T test and ANOVA.

### Introduction

Henry Fayol (1841–1925), considered as the Father of Administrative Management, postulated a general theory of management to guide managers of all times. Fayol (1949) classified the different activities of an undertaking into six categories, namely, technical, commercial, financial, security,

accounting and managerial. His work, Administration Industrielle Et Générale (1916), translated to General and Industrial Management in 1949, is primarily based on the last category of activity, that is, managerial activities or management. He believed that management is a pre-requisite for the success of all types of organizations, be it commerce, industry, army or any other (Daniel A. Wren, 1995). Therefore, Fayol brought forward fourteen principles of management which were most frequently used by the organizations while performing managerial activities.

Many authors interpret these principles as a set of rigid norms to be applied irrespective of circumstances (Crainer, 1996; Davidson and Griffin, 2000; George, 1972; Holt, 1993). However, Fayol did not intend to use the word 'principles' in a

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strict sense. He proposed some general guidelines, flexible enough to be moulded according to the situation.

According to him, management practices are not rigid and absolute, but are subject to vary in proportion on the basis of the situation. The applicability of principles is contingent to the situations prevailing at that time. This makes principles flexible in nature, leaving managers with the task of acquiring the relevant experience, knowledge, and skills to interpret different situations and accordingly make inferences about applicability of different principles. Brodie (1967) also emphasized that the principles should not be interpreted in a restrictive sense.

Moreover, Fayol accentuates that the principles of management are not finite in number, any managerial norm which has the capability of strengthening the position of an enterprise, is worth calling principle.

Various authors and researchers have varied views about the applicability of Fayol's Principles of Management in the contemporary world.

Michael J. Fells (2000) believes that Fayol's Model holds certain degree of relevancy and appropriateness in the contemporary management. But at the same time, he is of the opinion that Fayol's work is seldom believed to be superseded by observational findings and fails at certain parameters due to its age.

Hales (1986) noticed that there exists a "striking parallel" between contemporary models and 'classical principles of management'.

Archer (1990) highlights that during the 1930s and 1960s, the US productivity and standard of living rose. This was when the principles advocated by Fayol were popular. So, he suggests that America should go back to the principles. Archer also attributed much of Japanese success to Fayol's principles of management. He states that Fayol's principles are incorporated in various Japanese techniques, like the principle of "order" has been embodied in Just in Time (JIT).

The fourteen principles propounded by Henry Fayol are enlisted as follows:

1. Division of work
2. Authority and Responsibility
3. Discipline
4. Unity of Command
5. Unity of Direction
6. Subordination of individual interest to general interest
7. Remuneration of Personnel
8. Centralization
9. Scalar chain
10. Order
11. Equity
12. Stability of tenure of personnel
13. Initiative
14. Esprit de corps

**Objectives and Hypothesis of the Study**

1. To identify the presence of latent factors in the variables drawn on the basis of fourteen principles propounded by Henry Fayol.

2. To substantiate the existence of any significant difference in the perceived applicability of principles loaded on the identified factors based on gender.

Ho: There is no significant difference in the mean factor scores based on gender.

Ha: There is significant difference in the mean factor scores based on gender.

3. To substantiate the existence of any significant difference in the perceived applicability of principles loaded on the identified factors based on sector.

Ho: There is no significant difference in the mean factor scores based on sector.

Ha: There is significant difference in the mean factor scores based on sector

4. To substantiate the existence of any significant difference in the perceived applicability of principles loaded on the identified factors based on industry.

Ho: The mean factor scores don't significantly vary based on industry.

Ha: The mean factor scores vary significantly based on industry.

**Research Methodology**

A survey was conducted to collect information from working professionals cutting across sectors. Using convenience sampling method, 179 responses were solicited from people working in different industries. The survey responses were elicited through a questionnaire on a five point Likert Scale, comprised of fifteen questions based on principles advocated by Henry Fayol. **Multivariate, descriptive and inferential statistical tools including Cronbach's Alpha, KMO and Bartlett's Test, Factor analysis, independent t-test and ANOVA have been applied in order to test various hypotheses.**

Along with the primary survey various management journals, magazines, reports and websites were also referred.

This research will analyze the applicability of principles of Fayol in modern day organizations. Statistical tools through SPSS software and Excel have been applied.

**Demographics**

S. No.	Age Group	Per Cent
1	20-30	26
2	30-40	18
3	40-50	25
4	50 And Above	31
S. No.	Gender	Per Cent

1	Male	52
2	Female	48
<b>S. No.</b>	<b>Sector</b>	<b>Per Cent</b>
1	Private	39
2	Public	61
<b>S. No.</b>	<b>Age Group</b>	<b>Per Cent</b>
1	Services [banking]	22
2	Services [others]	58
3	Manufacturing	20

**Table A: Survey Instrument**

S. No.	Statements
Q1.	There is proper division of work among the employees in my organization/department.
Q2.	I have adequate authority to render my job responsibilities effectively.
Q3.	My organization follows proper code of conduct, non-adherence to which leads to penalties and sanctions.
Q4.	The assignment of work and reporting thereof is done only to one superior or boss.
Q5.	There is one plan headed by one superior/boss for activities with similar objectives.
Q6.	Given a situation of conflict between the organizational goals and my goals, the organizational goals are given a priority.
Q7.	My organization follows fair remuneration norm.
Q8.	So far as key decisions are concerned, the authority is centralized.
Q9.	The authority is decentralized for routine decisions.
Q10.	I can only contact my immediate superior/boss for work related problems.
Q11.	There is material order (proper place for physical resources) and social order (proper place for human resources) in my organisation.
Q12.	There is an unbiased system and attitude of equality towards every employee.
Q13.	The management strives to minimize employee turnover by assuring stability of our tenure in the organisation.
Q14.	We are encouraged to suggest new idea and organisation often accepts and acts upon suggestions.
Q15.	Staff connect activities (such as birthday parties, competitions, etc.) are often organized.

A questionnaire was designed to measure the variables under study. The respondents were subjected to fifteen questions on a five point Likert scale. The Likert responses were: 1. Strongly Agree, 2. Agree, 3. Neither Agree nor Disagree, 4. Disagree and 5. Strongly Disagree.

Although each principle was assigned one question, the principle of Centralization was split into two separate variables so that the extent of centralization as well as decentralization

could be known with precision. The questions asked in the survey are presented in Table A.

**Data Analysis**

**1. Factor Analysis**

Factor analysis is a widely recognized as a statistical technique used in multivariate analysis. Its use is rapidly proliferating the literatures of various disciplines such as economics, management and other social sciences. The rationale behind the use of this technique in the given study is to explore and identify the presence of latent factors in the hitherto manifest variables drawn on the basis of fourteen principles propounded by Henry Fayol. The process is subjective in its approach as the research intends to use the principles as a mere basis to study the perceived interrelationships in the variables.

**a. Test of Reliability**

The Cronbach’s Alpha was tested in order to find the reliability of the questionnaire used. The reliability co-efficient was found to be satisfactory, with a value of 0.817, which indicates a high level of internal consistency for our scale. (Table 1)

**Table-1: Reliability Statistics**

Cronbach's Alpha	.817
Cronbach's Alpha Based on Standardized Items	.823
N of Items	15

**b. Exploratory Factor Analysis**

An exploratory factor analysis was conducted to enable the reduction of the number of variables and exploration of the hidden dimensions in the stated observations. EFA is also considered particularly appropriate for there is a little prior theoretical basis for conducting a confirmatory analysis. The use of principal component analysis is unjustifiable in this case for the objective of the study surpasses mere reduction of data and encompasses drawing out latent dimensions from the observed variables.

**c. Criteria to be Met for Factor Analysis**

The suitability of the data for factor analysis was determined on the basis of three measures. These three aspects include sample size, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity.

According to Asmus (1989), an adequate sample size for the conduct of factor analysis on the underlying data could be determined on the basis of the subject to variable ratio. Hatcher (1994) recommended that the sample should exceed five times the number of variables, or an absolute figure of 100. In the given study, we have 179 respondents and 15 variables which will be submitted for factor analysis. The consequent initial subject to variable ratio is 11.93:1, which is acceptable according to most subject to variable ratio recommendations.

Hair et al. (2010) suggested an absolute sample size of 100 or more.

The value of the determinant is .015 which is greater than the necessary value of 0.00001. As the questions correlate fairly well and none of the coefficients is predominantly large, no question needs to be eliminated at this stage. The Kaiser-Meyer-Olkin measure of sampling adequacy (Table 2) of .852 indicates a more than adequate sampling and the suitability of the data for factor analysis. Further, the value of significance obtained from the Bartlett’s Test of Sphericity is less than 0.05 which confirms the appropriateness of the technique for the data. Hair et al., (2010); Tabachnick & Fidell, (2007) suggested that Kaiser-Meyer-Olkin (KMO) is greater than 0.6 and Bartlett’s Test of Sphericity (BTS) must be significant at  $\alpha < .05$ . Moreover, the anti-image correlation matrix showed the partial correlation coefficients close to 0, which indicates factorability among the variables. (Hair et al., 2010).

**Table 2: KMO and Bartlett's Test**

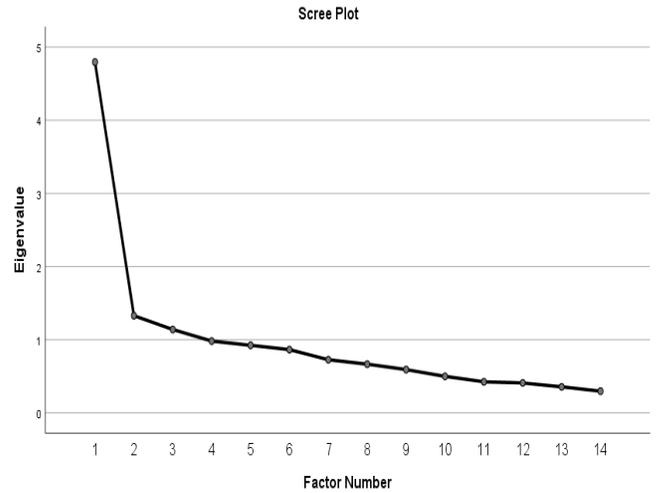
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.852
Bartlett's Test of Sphericity	Approx. Chi-Square	725.978
	Df	91
	Sig.	.000

**d. Factor Extraction and Retention**

Principal Axis Factoring was used for the extraction of factors. It enabled us to seek the minimum number of factors that can be used to define the underlying common variance in the set of variables. Principal Axis Factoring is known to give sufficiently accurate results as compared to the other methods of factor extraction.

The items with a loading of 0.4 or more on the factors were retained. Also, cross loadings below 0.4 are not considered significant. It was found that the variable ‘Q6’ was inconclusively and inadequately loaded i.e. the loading of the

variable on the factor was less than the threshold of 0.4. Hence, the variable was subsequently deleted from the analysis. The exploratory factor analysis was conducted with 14 variables and 179 subjects. The Eigen value greater than one rule or the K1 criteria retained three factors. The Cattell’s (1966) scree test was also examined to reduce the possibility of under or over extraction. (Figure 1). The break point in the graph occurs after the extraction of third factor.



**Figure-1: Scree Plot**

**e. Factor Rotation**

The orthogonal rotation method, Varimax was used to explore and identify a meaningful pattern within the factors. The rotated factor loadings are presented in Table 3. These loadings represent the correlations between the components and the factors.

The use of an orthogonal rotation was considered justified because a test conducted with an oblique rotation resulted in uncorrelated factors i.e. correlation coefficients less than 0.5.:

**Table-3: Rotated Factor Matrix<sup>a</sup>**

Statement	Factor		
	1	2	3
Q11	.764		
Q7	.576	.358	
Q1	.502	.310	
Q3	.483		
Q15		.707	
Q14		.700	
Q2	.310	.545	
Q12	.301	.501	
Q13	.323	.563	
Q5		.372	.655
Q10			.468
Q4			.413
Q9			.412
Q8			.402

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

#### f. Factors

Following factors were extracted

**Table-4: Constituents of Factors**

Q. No.	Constituents with respect to their respective question numbers	Factor loadings
<b>Factor 1 (Operations)</b>		
Q11	Order: There is material order (proper place for physical resources) and social order (proper place for human resources) in my organisation.	.764
Q7	Remuneration: My organization follows fair remuneration norm.	.576
Q1	Division of Work: There is proper division of work among the employees in my organization/department.	.502
Q3	Discipline: My organization follows proper code of conduct, non-adherence to which leads to penalties and sanctions.	.483
<b>Factor 2 (Human Resources)</b>		
Q15	Esprit De Corps: Staff connect activities (such as birthday parties, competitions, etc.) are often organized.	.707
Q14	Initiative: We are encouraged to suggest new idea and organisation often accepts and acts upon suggestions.	.700
Q2	Authority and Responsibility: I have adequate authority to render my job responsibilities effectively.	.545
Q12	Equity: There is an unbiased system and attitude of equality towards every employee.	.501
Q13	Stability of Personnel: The management strives to minimize employee turnover by assuring stability of our tenure in the organisation.	.563
<b>Factor 3 (Line and Extent of Authority)</b>		
Q5	Unity of Direction: There is one plan headed by one superior/boss for activities with similar objectives.	.655
Q10	Scalar Chain: I can only contact my immediate superior/boss for work related problems.	.468
Q4	Unity of Command: The assignment of work and reporting thereof is done only to one superior or boss.	.413
Q9	Decentralisation: The authority is decentralized for routine decisions.	.412
Q8	Centralisation: So far as key decisions are concerned, the authority is centralized.	.402

After detailed interpretation and analysis of the constituent components in each factor, the following titles were assigned to the factors:

Factor-1: Operations

Factor-2: Human Resource

Factor-3: Lines and extent of authority

#### **Factor-1: Operations**

The operations of an enterprise relate to its structure and functions. It is concerned with the technical aspect of the managerial work. A smooth and unrestricted functioning of any organization is ensured by the effectiveness and efficiency of its operations. This, in turn is determined by the best possible utilization of the material and human resources. The operational success of any organization can be achieved by minimization of cost in terms of the time, money and effort involved and maximization of subsequent returns on the resources employed. The management should constantly strive to build the competitive advantage by ensuring efficient arrangement of people and material, adherence to the rules and laws of

workplace, the clear distribution and direction of effort towards specific tasks and fairly rewarding well directed efforts as an incentive for more and better results.

The principle of order constitutes the highest loading on the factor, followed by remuneration, division of work and discipline. The order in an organization is practiced by ascertaining a right arrangement of material and people. This will result in an avoidance of loss of materials, saving of productive time and reduction of work related conflicts. Also, adherence to the implicit and explicit rules of the organization holds primary importance for the smooth running of operations. Fayol (1949) highlighted that discipline does not constitute employer made rules and regulations. Rather, it includes mutual agreements agreed upon by the employer and the employees or worker associations, which binds and satisfies both the parties. Such agreements, which drive the contemporary organizations, ensure healthy superior subordinate relationships and limited strikes by worker associations thus paving way for unrestricted and constant work. It is a known fact that an effort projected in a defined direction is bound to produce more and better results.

Division of work is recognized as the best means of making use of individuals and group of people (Fayol, 1949). The principle has relatively low loading on the factor. A probable implication could be derived that, although, specialization leads to effective utilization, however, it should be applied within a limit (Fayol, 1949). The productivity of men at work is also determined by the way they are rewarded for their efforts. A fair pay and reward would incentivize the process of work. Even a well set up, disciplined and orderly organization would not attract an employee to give his best if he is not satisfied with the returns to his endeavors.

**Factor-2: Human Resource**

Unlike his contemporaries, Henry Fayol emphasized upon the importance of personnel and their participation across the organizational spectrum. Not following an authoritarian approach, Fayol advocated a balance between worker autonomy and corporate efficiency (Litson, Philip A. and Parker Lee D., 2005). Thus, his principles propagate the need for harmony, equity, security and initiative in the working environment.

The principle of Espirit De Corps is highly loaded on the factor. Humans, unlike machines, are a part of social environment. They cannot function in isolation of each other. Every organization should strive to achieve harmony in relations and coordination in efforts for the attainment of its goals. A relationship founded on trust, loyalty and harmony would pave way for sharing of power between the superiors and the subordinates. The employees will be allowed to initiate and execute their ideas, as emphasized by the principle of initiative. A more formalized and concrete way of providing the employees a share in power is by giving the requisite authority and assignment of respective responsibility. This would lead to a satisfying and enriching experience at the workplace. For the employees to carry out these duties effectively, an organization should ensure equity and equality of treatment and the stability and security of their jobs. Equity and justice are the building blocks on which any organization stands. Also, an insecure employee is the most unproductive. He should be provided with sufficient time to improve and better his work. It should be noted that the principle of stability of tenure loads relatively low as compared to the other factors. An inference can be drawn that stability of jobs should be provided to an extent. It should not lead to an unproductive and laidback attitude on part of the

employees. Moreover, many organizations today, especially in the private sector, don't consider it important to provide stability of tenure. Employees who stay long, demand higher wages. Many companies, today, are also adopting downsizing strategies.

**Factor-3: Line and Extent of Authority**

The authority granted to employees and the extent of that authority essentially determines the efficiency of employees in fulfilling their obligations towards organization. The manner in which authority flows within an organization has serious implications for not only the success of organization, but also the precision and accuracy with which routine tasks are carried out. There is no one definite proportion in which the authority should be delegated; rather it is a relative phenomenon depending upon the situational variables. These variables range from the size of the organization to the skills and abilities of employees, and is not only limited to this, but can include any possible variable critical to the success of the organization. At the same time as soon as authority is exerted from more than one superior, over the same person or department frustration begins to arise among the employees, and if this condition persists, the efficiency of individuals as well as the quality of work starts declining. Generally, in an organization activities are categorized on the basis of objectives, and each one is headed by one individual. As soon as there is any variation in this practice, difficulty is bound to arise. The line of authority is the route followed i.e. all communications which start from and go to the ultimate authority. This line or the length of the route determines the speed with which decisions are taken and actions are carried out within an organization. The objective to pursue is the optimum utilization of resources at all levels.

**Hypothesis Testing**

Factor scores are the most useful outcomes of factor analysis (Tabachnick & Fidell, 2013). An independent sample t test was used to test the significance of difference between the mean factor scores based on gender and sector. A one way analysis of variance (one way ANOVA) was subsequently applied to test whether the mean scores of respondents from various industries significantly differ. The testing of hypothesis was done to substantiate the existence of any significant difference in the perceived applicability of principles loaded on each identified factor based on gender, sector and industry.

**Table-5: Independent Samples Test for Difference in Factor Scores of Male and Female Employees**

Factors		Levene's Test for Equality of Variances		T test for equality of means		
		F	Sig.	t	df	Sig. (2-Tailed)
Operations	Equal variances assumed	1.828	.178	.862	177	0.390
	Equal variances not assumed			.867	175.846	0.398
Human Resources	Equal variances assumed	.097	.755	.276	177	0.783
	Equal variances not assumed			.277	176.859	0.782
Line and Extent of Authority	Equal variances assumed	.739	.391	1.646	177	0.102
	Equal variances not assumed			1.656	176.129	0.100

Independent samples T-Test to compare the mean factor scores for males and females:

- There is no significant difference in ‘Operations’ scores for Males (M=0.0523025, SD=0.90584970) and Females (M=-0.0565597, SD=0.77174529), Conditions;  $t(177) = 0.826, p = 0.390$ .
- There is no significant difference in ‘Human Resource’ scores for Males (M=0.0166975, SD=0.86110814) and

Females (M=-0.0180566, SD=0.81870148), Conditions;  $t(177) = 0.276, p = 0.783$ .

- There is no significant difference in ‘Line and Extent of Authority’ scores for Males (M=0.0901347, SD=0.81393053) and Females (M=-0.0974712, SD=0.70098835), Conditions;  $t(177) = 1.646, p = 0.102$ .

**Table-6: Independent Samples Test for Difference in Factor Scores of Employees in Private and Public Sectors**

Factors		Levene's Test for Equality of Variances		T test for equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Operations	Equal variances assumed	.190	.664	.058	177	.954
	Equal variances not assumed			.058	148.111	.954
Human Resources	Equal variances assumed	.064	.801	4.008	177	.000
	Equal variances not assumed			4.008	149.842	.000
Line and Extent of Authority	Equal variances assumed	9.691	.002	-2.754	177	.007
	Equal variances not assumed			-2.605	121.803	.010

Similarly an independent T-Test was conducted to compare the factor scores for employees working in private and public sector.

Independent samples T-Test to compare the mean factor scores for private and public sector shows that:

- There is no significant difference in ‘Operations’ scores for private sector employees (M=0.0045517, SD=0.85451403) and Public sector employees (M=-0.0029923, SD=0.84017445) Conditions;  $t(177) = 0.058, p = 0.954$ .

- There is a significant difference in ‘Human Resource’ scores for Private sector employees (M=0.2976094, SD=0.80572292) and Public sector employees (M=-0.1956506, SD=0.80523862), Conditions;  $t(177) = 4.008, p = 0.000$ .

- There is a significant difference in ‘Line and Extent of Authority’ scores for Private sector employees (M=-0.1908095, SD=0.87090133) and Public sector employees (M=0.1254396, SD=0.66213701), Conditions;  $t(177) = -2.754, p = 0.007$ .

**Table 7: ANOVA for Difference in Factor Scores of Employees Working in Different Industries**

Factors		Sum of Squares	Df	Mean Square	F	Sig.
Operations	Between Groups	.320	2	.160	.223	.800
	Within Groups	126.326	176	.718		
	Total	126.647	178			
Human Resources	Between Groups	1.259	2	.629	.893	.411
	Within Groups	123.987	176	.704		
	Total	125.246	178			
Line and Extent of Authority	Between Groups	1.130	2	.565	.964	.383
	Within Groups	103.15	176	.586		
	Total	104.289	178			

A one way ANOVA analyzes the effect of Industry on factor scores of employees: The data were collected for employees working in 3 different industries namely, Services (Banking), Services (Others), and Manufacturing.

An analysis of variance shows that:

- the effect of Industry on ‘Operations’ scores (F (2,176) =0.223, p=0.800),

- the effect of Industry on ‘Human Resources’ scores (F (2,176) =0.893, p=0.411), and
- the effect of Industry on ‘Line and Extent of Authority’ scores (F (2,176) =0.964, p=0.383) are not statistically significant

The factor scores are summarized in Table 7

## Conclusion

The primary motive of the study was the exploration and identification of a factor pattern in the manifest variables derived on the basis of fourteen principles of administrative management advocated by Henry Fayol. The findings of an exploratory factor analysis applied on the data discovered the existence of three factors namely: Operations, Human Resource and Line and Extent of Authority. The variables loaded on the factor 'Operations' relate to the technical aspect of managerial work i.e. putting resources to optimum use. 'Human Resource' included variables which imply an existence of social environment in an organization. The third factor 'Line and extent of authority' constituted questions which point towards the direction, flow and degree of authority designated in any organization. Further, parametric tests such as independent t test and one way ANOVA were used to study the significance of differences in mean factor scores bases on gender, sector and industry. No significant difference is found on the perceived applicability of variables loaded on each factor based on gender. However, mean scores significantly differed for public and private sectors for two factors; 'Human Resource' and 'Line and extent of authority'. The factor scores failed to significantly vary for all the factors based on industry.

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