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# Re-engineering the public enterprise through strategy implementation (A study of Delta state, Nigeria)

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### ABSTRACT

This research study investigates the possibilities of "Re-engineering the objective of this study therefore, was to find out the major causes of the problems of low performance of the public enterprises, seek for the possible means of re-engineering the system and to determine how the public enterprises can assume a "going concern" identity after the process. Questionnaire was designed for the collection of data and ANOVA statistical test was used for the analysis of data. It was observed that public enterprises were impoverished by the leadership style of management and bureaucratic tendencies and the culture of the people that gave rise to corruption, abuses, impunity, etc, that the only thing that can salvage the system is entrenching a new public- management (NPM) where the elements of private sector system are put in place to abolish the old bureaucratic public service system. It was however recommended that government should grant autonomy of funds and management to public enterprises with adequate supervision for control, checks and balances, reward performing officers and punish deviant ones.

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### Introduction

Public enterprises are establishments, organizations, businesses, etc that are solely owned and managed by governments either at the Federal, State and/or Local government levels. Its modus operandi and general characteristics is that of a conventional civil service, and it is controlled by the government in power in a way that is most suitable to them, irrespective of the costs (inputs) and results (outputs/benefits) contrary to global practices which are result oriented.

The concept of "Re-engineering" is the application of scientific knowledge or ideas in the re-building of structures that constitute the functional aims of an organization, with the view of getting new and desirable results that can keep the organization going for foreseeable future. This new idea is called "Strategy" which ultimately re-frames, redefines and repositions the organization under a new framework called structure which is the road map of the organizational authority and responsibilities.

Tubey, et al (2015) lamented that Africa (including Nigeria) has been plagued by the "Crisis of governance" right from independence through the "lost decades" of the 70's and 80's calling for a radical rethinking and paradigm shift to a new management ethos. This paradigm shift included the redefinition of the role of the state in development initiatives, re-engineering of governance structures and management culture in public organizations.

Ocheni, et al (2012) in their own opinion expressed their view on how to achieve organizational success by means of re-engineering processes focused their attention on the "Leadership style, quality and ability of those who drive the force of management as the pivotal machinery that steer the ship of production activities through strategic ideas.

Shuaibu (2008) quoted Dracker (1974) in the definition of strategic planning as the continuous process of making present

entrepreneurial (risk taking) decisions systematically and with the greatest knowledge of futurity, organizing systematically the efforts needed to carryout these decisions, and measuring results of these decisions against expectations through organized systematic feedback". It means decisions for continuity, survival and profitable going-concern.

The above definition of strategic planning as it concerns re-engineering of public enterprise means planning in a systematic way using strategic ideologies to chart a new course for the organization to ensure adequate productivity, positive result oriented programmes, sustainability of goals through organized and well built institutions that brings in foresight and management expertise to bare, and renewing facilities through self generated resources and or funds thereby creating or establishing going concern ethics, norms, or culture that pervades the entire system which is different from the traditional civil service culture that characterized the public enterprise.

#### 1.1 Statement of the Problem

The nature and pattern of public enterprise in the time past, especially the last century and in the current situation has been that of an revolutionized public administration which tries to develop some ideas to cope with the nee dynamic and complex external environments and internal differentiations within and amongst agencies through the development of adequate internal public administrative interfaces. These efforts however, have not yielded the required result because of lack of proper structural and cultural integrations that ought to emanate from redefined ideological framework called strategic planning which brings about positive change.

According to Agabi and Orokpo (2014), inefficiency of public enterprises is epitomized by epileptic services they render to the public. Also, Olaued (2007) succinctly explained that public enterprises create economic inefficiencies, incur huge financial losses, and absorb disproportionate share of

credit, especially in the form of foreign loans. The study therefore seeks to investigate the re-engineering of public enterprises through strategic planning.

Musa (2005), Omeleke and Adesepo, (2005) posit that the performance of public enterprises in the early 70s and 80s has been impressive, but unfortunately, in the beginning of 90s, their performance started declining, and failed to meet the aspirations of the targeted socio economic development.

### 1.2 Objectives of the Study

The general objective of this study is the "Re-engineering of the public enterprise through strategic planning while the specific objectives are as stated below:

1. To ascertain whether a fit between organization structure and planning needs is sought in the process of strategy implementation.

2. To determine how the feedback system is integrated in strategy implementation.

### 1.3 Research Questions

The relevant questions that could be of help to this exercise are as follows:

1. To what extent does a fit between organizational structure and planning needs influence strategy implementation?

2. How is the feedback system integrated in strategy implementation?

### 1.4 Hypotheses

1. A fit between organization structure and planning needs has no influence on strategy implementation.

2. The feedback system is not integrated in strategy implementation.

## 2.0 Review of Related Literature

This aspect of the report refers to the acknowledgement of previous authors who had worked on the subjects that are related to this study with a view to ascertaining their findings, methodology, submissions, etc.

### 2.1 Conceptual Framework

According to Tubey, et al (2015) who referred to the observations of (Boston, 2000; Barzelay; Khaleghian and Gupta, 2005) and their conception that there is an implicit agreement in the public management literature, that the two decades spanning 1975-19995 witnessed a new universal re-definition of the relative roles of government, business and the market in both developed and developing countries. Evidence from the United States, the United Kingdom and Europe, as well as Australia and New Zealand, suggests that the new public management (NPM) is, but the contemporary response to the on-going process of change in public administration and governance since the late 18<sup>th</sup> century.

Ferlie, et al (1996), quoted by (Tubey, et al, 2015) maintains that New Public Management (NPM) has come to be regarded as a collective term for a bundle of particular management approaches and techniques, many of which are borrowed from the private-for-profit sector. It is a rising body of managerial thought. Some (e.g. Pollitt, 1990) have even characterized it as an ideological thought system based on ideas generated in the private sector and imported into public sector organizations.

According to Robert Anthony (1976), strategic planning is the process of deciding on the objectives of the organization, on changes in these objectives, on the resources used to attain these objectives and on the policies that go to govern the acquisition, use and disposition of these resources. Mathur and Reeta (2009) stated that India for the past four decades was pursuing a path of development in which the public sector was expected to be the engine of growth. It was

the result of the policy of providing favourable environment to the growth and development of the public sector that the nation achieved self-sufficiency in sector more than one in the economy. According to them, the public sector had overgrown itself and their shortcomings manifesting in the shape of low capacity utilization and low efficiency due to over manning and low work ethics, over capitalization due to substantial time and cost over runs, inability to innovate, take quick and timely decisions, large interference in decision making process etc,

Ocheni, et al (2012) focused their work on the concept of organizational leadership. In their own view concerning re-engineering the organization for success, they believe that leadership style and abilities can turn around, confine the fortunes of organization for enduring legacies that can stand the test of time. In this regard, they stated that the issue of leadership is primary in the discussion of modern organisations, be it governmental, individual, or jointly owned business concern.

Furthermore, they emphasized that the impact of leadership style on the progress of any organization becomes manifest through the performance of the workforce shown through the productivity level of the outfit towards the attainment of its corporate objectives.

Finally on this note, they remarked that the "Leadership of an organization should not only be able to influence the members to act willingly towards achieving organizational goals, but should also structure the activities of the organisation in such a way that members, in the process of achieving the overall organizational goal, will equally achieve their personal goals. The leadership should ensure job satisfaction of the members of the organization, their job security, their acquaintance with organizational policy and their direct or indirect participation of policy decisions. These roles they say, required of a leader is embedded in democratic leadership style against the autocratic style.

### 2.2 Theoretical Framework

This study was based on the Gluek (1982) theory of "Grand Strategies" and that of Porter (1985) theory of "Generic Strategies" to expatiate the need of change that an enterprise requires which can be applied to public enterprises through strategic planning for success and continuity.

Gluek (1982), quoted by Okafor (2008) proposed "Grand Strategies that are foremost for organisations to adopt in order to achieve success. According to him, there are four strategy alternatives available to an organization. These strategy options are; stability strategies, expansion, strategies, retrenchment strategies and combination strategies. According to him, there are two bases for classifying these strategies: the level of effort exerted by management in pursuing these strategies and the objective of the effort which is based on the purpose desired to be achieved by the strategy. For instance .the aim of expansion strategy is to ensure rapid growth of an enterprise.

Porter (1985) quoted by Okafor (2008) identified and proposed "Generic strategies" that organisations can develop and adopt a market orientation that creates for it some competitive advantages and competitive scope. Generic strategy is a business level strategy that tends to position the business on a strong footing in a hyper-competitive environment (quoted by Okafor 2008; from the works of Hill and Jones, 1995; Kazimi, 2002). According to him, there are three (3) dimensions of generic strategy; cost leadership strategy, differentiation strategy and focus strategy. There are

benefits associated to cost leadership strategy which can be articulated using Porter's (1985) five forces model of threats from: competition, powerful suppliers, powerful buyers, substitute products, and new entrants. An example of cost leadership benefits is that the cost leader is protected from competition in the industry because of its lower costs.

### 2.3 Empirical Review

Tubey, et al (2005) in their report focused their attention on the change process that was required in public administration. Ferlie, et al (1996) based their work on the New Public Management (NPM) which is a private sector element technique that is transferred to the public sector for efficiency and result oriented plan while Marthur and Reeta (2009) emphasized so much on the reasons public service failed as a result of its bureaucratic nature and interferences.

Robert (1996) perspective was purely on strategic planning, decision making on the acquisition, use and disposition of resources while the work of Gluek (1982) and Porter (1985) centred on the basic strategies to be adopted in order to formulate a good policy, objective and the required effort to achieve those identified objectives for effective results (Grand Strategies) and the Porters five forces to withstand competitions in the global dynamic economy, withstand the powerful suppliers, buyers, substitute products and possible new entrants from the key policy dimensions of cost leadership, differentiation and focus strategy (Generic Strategy). After the comparative diligence above, of the various authors, it was observed that the actual framework for public enterprise from the re-generational process was not fully addressed and enunciated, hence, this study was designed to fill the gap.

Tubey, et al (2015) expressed their view on the reform process and stated that "The thematic focus of New Public Management as a tool for re-engineering the public sector is based on the assumption that the approach is a contemporary political economy agenda that goes far beyond the house keeping functions of government to question the basis of the "Public Interests" approach. The rational assumption is that government had overgrown too big and it ought to shed activities that other institutions could perform. Government should be brought closer to citizens, and should consider things from their points of view, not just from its own superior vantage point. These lines of views are further pursued in the following section.

#### 2.3.1 Re-inventing Government

This implies changing the political system or restricting the system to make it more efficient. It may also mean downsizing the government or embracing the policy of privatization. Some authors look at it as a way of reducing waste, fraud and abuse or impunity.

But Ogbone & Gaebler (1992) as quoted by Tubey (2015) contend that "Reinvention is about replacing bureaucratic organisations and behavior. It is about creating public organisations and systems that habitually innovate, that continually improve their quality without having to be pursued from outside.

Reinvention in public institutions in developed democracies has led to the emergence of entrepreneurial governments and has taken place in many developed countries like U.S.A. Canada, U.K. Ireland, Australia, New Zealand, Singapore, Sweden, Norway, Netherlands, Germany, etc. Some developing countries like, Chile, Argentina, Brazil, South Africa, South Korea, Malaysia, etc have also taken initiatives.

#### 2.3.2 The Need for Entrepreneurial Behaviour

In this area of our discussion, it must be mentioned that it is all about criticisms to ancient bureaucratic norms which were based on the hierarchy and stringent rules and/or standards which must be followed to the letter even in times of emergency. This system does not fit properly to today's dynamic economic system where the world's activities is going with the light speed changing simultaneously with every little bit of information, outsmarting each other with the high quality syndrome which is characterized of the modern age business and market societies.

#### 2.3.3 Entrepreneurial Government

The entrepreneurial government initiates more efficient and effective ways of managing systems and organisations. It is a government that moves with the time and age of the society that emulates world's dynamic changes and innovations and recognizes the need to abandon old and irrelevant programmes and methods. It encourages taking timely and necessary action. It is business orientation that goes for efficient result and not just the attitude of maintaining status quo - protecting their own position, resisting change for selfish reasons, etc.

Frankly speaking, entrepreneurial governments support competition between service providers, and measures performance of their agencies on the basis of outputs rather than inputs expended. They are highly market-oriented and shun bureaucracy in all forms.

#### 2.3.4 New Public Management

The New Public Management (NPM) which has earlier been mentioned, is a new system of administration that involves systematic and innovative management techniques that borrows its ideology from the private-for-profit sector that is aimed at improving public services for efficient results. It is not a homogenous whole, but consists of varieties of practices and techniques. It involves; breaking up huge bureaucracies by disaggregating separable functions into separate agencies; replacing traditional "tall hierarchies" with flatter, flexible and more responsive structures formed and reformed around specific processes (e.g. issuing licenses, paying of benefit(s), separation between funding, purchasing and provision of services, decentralising management authority within public agencies, etc.

#### 2.4 Re-Engineering the Public Enterprise

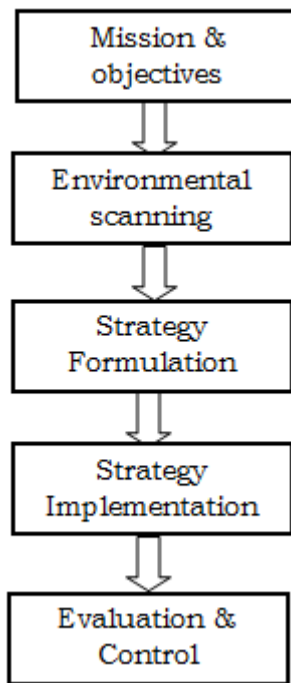
We have discussed the reasons public service needs to be reformed. It is pertinent for us to go ahead and prescribe the possible means of re-engineering the process which is referred here as the strategic planning process.

In today's highly competitive business environment, budget-oriented planning or forecast-based planning methods are insufficient for a large corporation to survive and prosper. The firm which is the public enterprise in this case must engage in strategic planning that clearly defines objectives and assesses both the internal and external situation to formulate strategy, implement the strategy, evaluate the progress, and make adjustments as necessary to stay on track.

A simplified view of the strategic planning process is shown on the diagram below.

#### The Strategic Planning Process

The comprehensive analysis of each stage of the processes cannot be expatiated in this context, but an implantation of this process and systematical substituted into the public enterprise can give us the change we deserve in our public enterprise system.



### 3.1 Methodology

In this study, we carried out our investigations on the agencies in Delta State of Nigeria. Out of twenty (20) agencies, five were considered necessary for the study.

The research population from these five (5) agencies was 600 staff, out of which 100 (20 from each) were randomly selected.

Questionnaire was designed for the study, and copies of same were distributed accordingly to the 100 selected staff from the various agencies. 85 respondents returned their questionnaire as a result of dogged effort to locate and get responses from the respondents. Fifteen copies were not retrieved.

The agencies selected were: Agricultural Development Programme (ADP), Delta Transport Services (Delta Line & Delta Boat Yard), Pointer Newspaper, Oil Palm research centre, Nsukwa, Delta State and Songai Delta, Amukpe (Sapele), Delta State.

It was considered that the proportion of the questionnaire used adequately represented the entire population of the study in order to permit undistorted findings, valid conclusion and bias generalization of findings. The analysis of variance (ANOVA) was used for data analysis.

### 3.2 Presentation of Data and Analysis

The information received from the respondents through the questionnaires and interviews plus the literatures reviewed is hereby presented and analysed for better understanding.

**Table 1. Major Problems of Public Enterprises**

Details	Frequency	%
Corruption	20	24
Poor strategy implementation	50	59
Culture	15	17
Total	85	100

Source: Field Survey, 2015.

Table 1 revealed that the major causes of the problems of public enterprises are corruption, strategy implementation and culture. The respondents voted for 24%, 59% and 17% respectively.

Table 2 is the distribution showing the possible means of effecting the change in the public enterprises system through fitting structure to plans.

**Table 2. Possible Means of Change Via Strategy Implementation (fitting structure to plans)**

Details	Frequency	%
Strongly agree	18	21
Agree	16	19
Undecided	18	21
Disagree	14	17
Strongly disagree	19	22
Total	85	100

Source: Field Survey, 2015.

The ANOVA led in (Appendix "A") shows that the critical value of F at 5% significance level is 2.87. Thus, since 3,97 is greater than 2.87, we reject the statement that public enterprises cannot be re-engineered through fitting organizational structure with planning needs (an aspect of strategy implementation).

### Test on the Prospect of a Re-Engineered

**Table 3. Public Enterprises to Become a Going Concern**

Details	Frequency	%
Optimistic	65	76
Indifferent	12	14
Pessimistic	8	10
Total	100	100

Source: Field Survey, 2015.

Table 3 is all about the prospect of a re-engineered public enterprise and how it can become a going concern. 75% of the respondents were optimistic that if properly handled and maintained according it must surely be achieved, 14% were optimistic, while 10% felt pessimistic.

**Table 4. feasibility of Public Enterprise Transformation Via Integration**

Details	Frequency	%
Strongly agree	19	22
Agree	14	16
Undecided	21	25
Disagree	13	15
Strong disagree	18	22
Total	85	100

Source: Field Survey, 2015.

Table 4 shows the distribution of the feasibility of public enterprises transformation and from the opinion of the respondents, 22% strongly agreed, 16% disagreed, 25% were indifferent, 15% disagreed and 22% strongly disagreed. As shown in Appendix I, this was tested with the ANOVA at 5% significance level.

**Table 5. justification of the Re-Engineering Programme**

Details	Frequency	%
Highly necessary	60	70
Necessary	15	18
Neutral	5	6
Not necessary	5	6
Total	85	100

Source: Field Survey, 2015.

Table 5 is about whether the re-engineering programme of the public enterprise is justifiable enough or not, and the respondents' view on it shows that 70% feel it is highly necessary to curb the excesses of the not my father's business' syndrome and looting of the treasury. While 18% say it is necessary, 6% are neutral on the issue, while 6% feel it is not necessary, that after all, some people who may take over the enterprises may squander the whole resources accumulated after it has been revived and nothing will happen to them.

### Findings and Discussions

It was observed that public enterprises are being impoverished by the leaders or management as a result of poor strategy implementation and the culture otherwise known as

the orientation they have before now on public funds, assets, etc, and that gave rise to the massive corruption that engulfed the system. This view is in agreement with the views of Tubey, et al (2015) who quoted (Boston, 2000; Barcelay; Khaleghian and Gupta, 2005).

It was observed that unless the public enterprises are changed and made to run like the private sector profit-oriented outfits that depends on their own fund and take decision at will to cope with the competitive environment, they will continue to witness poor performance. The need for a new public management (NPM) was advocated, and it is in line with the advocacy of Ferlie, et al(1996).

It was further observed that the leadership quality and style needs to be overhauled as they have a key role to play and act proactively like modern managers all over the world to effect the change desired. This is in agreement with the views of Ocheni et al (2012).

Finally, it was observed that there is the need for management to undertake strategic planning initiatives in re-defining, deciding good objectives that bring good result to the organization about the acquisition, use and disposal of public assets and resources. This is in line with the opinion of Robert (1976).

### Conclusion

The study was on the re-engineering the public enterprise through strategic planning to give a new life to the system and curb the excesses and impunity of public service administrators as a result of the bureaucratic system, culture in place that gave room for massive looting of public treasury, assets and resources. The survey method of investigation through the use of questionnaire was adopted.

It was observed that there is the need to undertake the transformational change and through the use of strategic planning and government commitment, better results will be achieved, and it will assumed the nature of a going concern where funds are generated on their own and profits are used to maintain the facilities and provide adequate services to the people.

### Recommendations

Given the present situation of our economy and the dynamic nature of global environment, no meaningful nation will sit back and watch its resources and assets go down the drain, without seeking for a proper solution. Against this background, it is hereby recommended that the government should accelerate all the efforts put in place to revive all the agencies especially the NNPC, Textile industries, Mines, Steel industries and all the Agro allied industries now that the diversification of our economy is in the fore front now.

- Government should take proper step in making sure that technocrats and experts occupy the economic team to steer the ship of re-engineering all the government agencies to take the shape of private sector outfit.

- Generation of fund and autonomy to operate without waiting for budget implementation of the Federal, State and Local Government should be adopted, and adequate supervision from genuine established government officials must be put in place. Special control, checks and balances must be installed in the system to curb or totally eliminate fraud, abuses and corruption from the system.

- Finally, performance measures should be established to punish deviant managers or officers and reward honest and hardworking staff who boost and ensure the efficiency of the system.

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### Hypothesis I

A fit between organization structure and planning needs has no influence on strategy implementation.

Strongly agree	2	4	3	4	5
Agree	2	3	4	4	3
Undecided	3	3	4	5	3
Disagree	3	3	2	4	2
Strongly disagree	5	7	2	3	2
	$x_1=15$ $\bar{x}_1 = 15/5 = 3$	$x_2=20$ $\bar{x}_2 = 20/5 = 4$	$x_3=15$ $\bar{x}_3 = 15/5 = 3$	$x_4=20$ $\bar{x}_4 = 20/5 = 4$	$X_5=15$ $\bar{x}_5 = 15/5 = 3$

Within group degrees of freedom =  $(n_1-1) + (n_2-1) + (n_3-1) + (n_4-1) + (n_5-1)$   
 $= (5-1) + (5-1) + (5-1) + (5-1) + (5-1) = 20$

Overall average,  $\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{5}$   
 $= \frac{3 + 4 + 3 + 4 + 3}{5} = 3.4$

Between Group Degree of Freedom = Number of groups minus  
 $1 = c - 1 = 5 - 1 = 4$

**Computation of Table sum of Squares, TSS**

X	F	F <sub>x</sub>	$\bar{x}$	Tv=TSS=f(x- $\bar{x}$ ) <sup>2</sup>
2	2	4	3.4	2(2-3.4) <sup>2</sup> = 3.92
3	2	6	3.4	2(3-3.4) <sup>2</sup> = 0.32
5	1	5	3.4	1(5-3.4) <sup>2</sup> = 2.56
3	3	9	3.4	3(3-3.4) <sup>2</sup> = 0.48
4	1	4	3.4	1(4-3.4) <sup>2</sup> = 0.36
7	1	7	3.4	1(7-3.4) <sup>2</sup> = 12.96
2	2	4	3.4	2(2-3.4) <sup>2</sup> = 3.92
3	1	3	3.4	1(3-3.4) <sup>2</sup> = 0.16
4	2	8	3.4	2(4-3.4) <sup>2</sup> = 0.72
3	1	3	3.4	1(3-3.4) <sup>2</sup> = 0.16
4	3	12	3.4	3(4-3.4) <sup>2</sup> = 1.08
5	1	6	3.4	1(5-3.4) <sup>2</sup> = 3.56
2	2	4	3.4	2(2-3.4) <sup>2</sup> = 3.92
3	2	6	3.4	2(3-3.4) <sup>2</sup> = 0.32
5	1	5	3.4	1(5-3.4) <sup>2</sup> = 2.56

$TSS = \sum f(x - \bar{x})^2$

Between Group Variation, BGV =  $\sum ni(\bar{x} - \bar{x})^2$

**Computation of within Group Variation**

x	$\bar{x}_1$	(x- $\bar{x}_1$ ) <sup>2</sup>	$\bar{x}_2$	(x- $\bar{x}_2$ ) <sup>2</sup>	$\bar{x}_3$	(x- $\bar{x}_3$ ) <sup>2</sup>	(x- $\bar{x}_4$ ) <sup>2</sup>	$\bar{x}_5$	(x- $\bar{x}_5$ ) <sup>2</sup>	
2	3	1								
2	3	1								
3	3	0								
3	3	0								
5	3	4								
4			4	0						
3			4	1						
3			4	1						
3			4	1						
7			4	9						
3					3	0				
4					3	1				
4					3	1				
2					3	1				
2					3	1				
4							4	0		
4							4	0		
5							4	1		
4							4	0		
3							4	1		
5									3	4
3									3	0
3									3	0
2									3	1
2									3	1

Within group variation

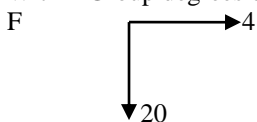
$(x_i - \bar{x}_i)^2 = 30$

Between Group Variation = 15

Between Group degrees of freedom = Number of groups minus

$1 = 5 - 1 = 4$

Within Group degrees of freedom = 20



$SB^2 = \frac{\text{Between Group Variation}}{\text{Between Group degree of freedom}}$   
 $= \frac{23.8}{4} = 5.95$

$SW^2 = \frac{\text{Within Group Variation}}{\text{Within Group degree of freedom}}$   
 $= \frac{30}{20} = 1.5$

$F = \frac{SB^2}{SW^2} = \frac{5.95}{1.5} = 3.97$

Statistical Decision: Since the computed value of F (3.97) is greater than the critical value (2.87), we reject H<sub>0</sub> and accept H<sub>1</sub>.

Conclusion: The organizations differ in their perception of re-engineering through fitting organizational structure with planning needs.

**Hypothesis 2**

Overall average;  $\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{5}$

$\bar{x} = \frac{4 + 3 + 3 + 4 + 3}{5} = 14/5 = 2.8$

Within group degrees of freedom =

$(n_1 - 1) + (n_2 - 1) + (n_3 - 1) + (n_4 - 1) + (n_5 - 1)$

$= (5 - 1) + (5 - 1) + (5 - 1) + (5 - 1) + (5 - 1) = 20$

Between Group Degree of Freedom = Number of groups minus

$1 = c - 1 = 5 - 1 = 4$

**Computation of Table sum of Squares, TSS**

X	F	F <sub>x</sub>	$\bar{x}$	Tv=TSS=f(x- $\bar{x}$ ) <sup>2</sup>
2	2	4	3.4	2(2-3.4) <sup>2</sup> = 3.92
4	2	8	3.4	2(4-3.4) <sup>2</sup> = 0.72
8	1	8	3.4	1(8-3.4) <sup>2</sup> = 21.16
2	2	4	3.4	2(2-3.4) <sup>2</sup> = 3.92
3	1	3	3.4	1(3-3.4) <sup>2</sup> = 0.16
4	2	8	3.4	1(4-3.4) <sup>2</sup> = 0.72
2	2	4	3.4	2(2-3.4) <sup>2</sup> = 3.92
3	1	3	3.4	1(3-3.4) <sup>2</sup> = 0.16
4	2	8	3.4	2(4-3.4) <sup>2</sup> = 0.72
2	1	3	3.4	1(3-3.4) <sup>2</sup> = 0.16
4	3	12	3.4	3(4-3.4) <sup>2</sup> = 1.08
6	1	6	3.4	1(5-3.4) <sup>2</sup> = 3.56
2	2	4	3.4	2(2-3.4) <sup>2</sup> = 3.92
3	2	6	3.4	2(3-3.4) <sup>2</sup> = 0.32
5	1	5	3.4	1(5-3.4) <sup>2</sup> = 2.56

$TSS = \sum f(x - \bar{x})^2 =$

Between Group Variation, BGV =  $\sum ni(\bar{x} - \bar{x})^2$

$5(4-3.4)^2 = 1.8$

$5(3-3.4)^2 = 0.8$

$5(3-3.4)^2 = 0.8$

$5(4-3.4)^2 = 1.8$

$5(3-3.4)^2 = 0.8$

BGV = 6.0

The feedback system is not integrated in strategy implementation.

Strongly agree	4	2	4	4	5
Agree	2	2	3	4	3
Undecided	4	4	4	6	3
Disagree	2	3	2	4	2
Strongly disagree	8	4	2	2	2
	$x_1=20$ $\bar{x}_1 = 20/5 = 4$	$x_2=15$ $\bar{x}_2 = 15/5 = 3$	$x_3=15$ $\bar{x}_3 = 15/5 = 3$	$x_4=20$ $\bar{x}_4 = 20/5 = 4$	$X_5=15$ $\bar{x}_5 = 15/5 = 3$

Computation of within Group Variation

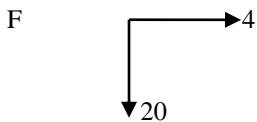
X	$\bar{x}_1$	$(x-\bar{x}_1)^2$	$\bar{x}_2$	$(x-\bar{x}_2)^2$	$\bar{x}_3$	$(x-\bar{x}_3)^2$	$(x-\bar{x}_4)$	$(x-\bar{x}_4)^2$	$\bar{x}_5$	$(x-\bar{x}_5)^2$
4	4	0								
2	4	4								
4	4	0								
2	4	4								
8	4	16								
2			3	1						
2			3	1						
4			3	1						
3			3	0						
4			3	1						
4					3	1				
3					3	0				
4					3	1				
2					3	1				
2					3	1				
4							4	0		
4							4	0		
6							4	4		
4							4	0		
2							4	4		
5									3	4
3									3	0
3									3	0
2									3	1
2									3	1

Within Group Variation =  $\Sigma(x_i - \bar{x}_i)^2 = 46$

Between Group Variation = 6.0

Between Group degrees of freedom = Number of groups minus 1 = 5 - 1 = 4

Within Group degrees of freedom = 20



$$B^2 = \frac{\text{Between Group Variation}}{\text{Between Group degree of freedom}}$$

$$= \frac{6}{4} = 1.5$$

$$SW^2 = \frac{\text{Within Group Variation}}{\text{Within Group degree of freedom}}$$

$$= \frac{46}{20} = 2.3$$

$$F = \frac{SB^2}{SW^2} = \frac{1.5}{2.3} = 0.65$$

Statistical Decision: Since the computed F- value (0.65) is less than the critical value (2.8), we reject H<sub>1</sub> and accept H<sub>0</sub>.

Conclusion: We conclude that the firms do not differ in their integration of the feedback system in strategy implementation