BARRIERS IN IMPLEMENTING RADICAL/INCREMENTAL CHANGES IN MANUFACTURING – BASED GOVERNMENT ORGANIZATIONS

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ABSTRACT

The purpose of the study is to empirically examine the relationships between key sets of variables known to influence the successful implementation of change management necessitated due to implementation of incremental or radical changes in Government owned manufacturing organizations. The sets of variables are confined to management related barriers. Primary survey data has been collected from public sector companies, defense organizations, academicians, management consultants. The study examines the inter-correlations among the variables representing barriers to change; and identify underlying constructs by using factor analysis approach. This would provide a useful framework in developing strategies for an effective absorption of changes in Government organizations.

Keywords: *Change management, BPR principles, TQM principles, Management barriers, Organization culture, and Factor analysis, Public sector companies.*

1. INTRODUCTION

After WW II, the countries did not have the financial strength to invest in capital intensive projects. This led to opening up government owned high capital intensive manufacturing units – named as public sector units. India, whose economy, after independence, was very weak, relied more on public sector units in initiating industrialization process. The market was clearly dominated by manufacturer – seller. The main underlying principles were the division of labor, structuring organizations having clear differentiation between the activities of planning and execution, with separation of mental (managerial) and physical work (industrial workers), and the classical management model – which emerged out of the philosophy developed by F W Taylor. The Taylorist organization of production increased the productivity of labor. In private sector, ' Ford production system', which initiated the 'mass production system' fulfilled the need of the growing economy of USA and European industries. The emphasis was on the productivity of individuals who were tasked by engineers/managers. Eiji Toyota realized that this system of Taylor and Ford, was not only inflexible, but also was capital-intensive. It did not fulfill the economic and cultural requirements of the Japanese conditions which was having limited resources. Toyota's philosophy was to design lean organizational structures, policy programs – with emphasis on conscious planning' - (Vogel[35], 1979**).** It was termed as 'Toyota production system'. Figure 1 summarizes the evolution of manufacturing methodologies from 1911 to 2009. Corporate have undergone and continue to undergo fundamental changes. Changes were from classical approach to portfolio management to business processes to the contingency approach to dynamic engagement approach. The changes in operations management from a focus on local optimizations (e.g. linear programming, MRP scheduling) and a "mechanistic" linear cause-effect perspective (Johnson[16], 2007) to more systemic optimization efforts taking into account nonlinear complex cause-effect connections (living systems) became imperative to improve operational efficiencies in reducing cost, wastages, and improving quality. The impetus for this change comes both from reactively to competitive pressures to proactively to improve corporate performance. The corporate kept using 'change management' techniques for smooth transformation from a state to improved version of state of different ways of doing old things.

However, public sector organizations had only been seeking capacity (the ability to get things done), rather than changing (a different way of doing old and new things). The change management strategies and methods are often being resisted by managers (top as well as executive levels).

Leaders in government agencies operate under handicaps largely unknown in private sector. But the best of them have improved performance by adopting and adapting some goals and methods that have been proven in business world (Frank[7] 2006).

Change is imminent – either as planned changes, or imposed, or stimulated in other fashions such as by a crisis. The change focuses on organizational change management processes; and once the need and rationale for change has been established, it goes about suggesting good practice to affect change in public sector organizations.

In this research paper, we have addressed the question "What are the management barriers to change process in Government sector?" We have limited our research in understanding basic business processes of government owned manufacturing organizations, i.e., management processes - which set the organizational context and style of working; business processes - which are complex, comprise of activities like product design, order fulfillment and customer service; and work processes, which focus on how the work gets done. We have studied only those organizations which had either undergone for 'incremental changes' – TQM, or had undergone for 'radical changes' – BPR.

2. RESEARCH OBJECTIVE

The objective of the study is to empirically examine the barriers associated with managing the 'change transformation', and to establish a relationship among these barriers.

3. RESEARCH METHODOLOGY

Data for the study were collected through questionnaires which were mailed to 639 respondents from public sectors, defense organizations, academicians, and management consultants. The questionnaire comprised of two sections. The first section was related to collecting background information of the respondents – such as title of the respondent, type of organization, whether the organization was involved in incremental or radical changes. In the second section, the respondents were asked to give their opinion by grading the statements out of grade of five (strongly disagree = 1, disagree = 2, partly agree = 3, agree = 4, strongly agree = 5) to 28 statements representing "potential barriers to operation changes", and 41 statements representing "potential undesirable outcome to operation changes". The statements were framed both positively and negatively to avoid biasness in a specific direction.. Both the positively and negatively worded statements were reexamined before analyzing the data. Thus a lesser mean rating implied a lesser significant barrier to change process. Items listed in questionnaire are displayed in Table - 1.

Exploratory principal components factor analysis was used to establish any correlations among the 28 items representing barriers to change process. Further, factor analysis with varimax rotation was used to extract minimum number of factors that can explain the existence of smaller number of underlying barriers as well as in understanding better interpretability.

4. LITERATURE REVIEW

Radical changes or incremental changes can be characterized as the implementation of deliberate and fundamental change in business process to achieve breakthrough improvements in performance. Lewin's[21] theory of change 1951**,** is universally recognized. Lewin identified three sequential phases of the change process. The first stage is the *unfreezing stage* which creates a *climate for change.* The second stage is *moving stage*, which involves analysis, design, and installation. The final stage is, *refreezing*, which *institutionalizes* the change. Ginzberg's[8] (1981) finding of the planned change approach indicates that implementation success occurs when (1) commitment to change exists; (2) commitment to the project exists; and (3) the project is well defined and plans are clearly specified.

Matta[24], 1996; Ngai and Cheng[25] 1997; Salegna and Fazel[28] 2000, have focused their study on to the obstacles to TQM (continuous improvement programs). Olian and Rynes[26] 1992, Kuei[19] 1997 studied the effect of organizational culture to implementation of TQM. Mann and Kehoe[22] 1995 examined the efficacy of management style in TQM. Fok[6] 2000 narrowed his study on the impact of employee factors, and Hides[14] 2000 studied ineffective project management. Champy[2] 1995 observed that majority of radical changes – BPR efforts failed in corporate. Grover[10,11,12] 1988, 1994, and 1995 studied the framework development, variable identification, exploration relationships to identify the barriers of implementing BPR.

Many researchers in the field of organizational development have concentrated on techniques such as – modifications in organizational behavior, job enrichment, management by objectives, team building, quality of work life, control cycle, and socio - technical systems approaches. Cummings[3] (1989). Markus[23] (1983)

explained resistance to change and implementation difficulties primarily in terms of the conflict among participants for increased power. Markus She explained the resistance by people-oriented theory, system-oriented theory, and interaction theory. According to the interaction theory, the best prescription for an implementation strategy will follow from a thorough diagnosis of the organizational setting in which an innovation will be used. In political version of interaction theory the resistance is the product of the intra-organizational distribution of power with the system design features.. Based on Pfeffer's[27] (1981) work, it is suggested that the political variant of the interaction theory is the most appropriate framework for understanding incremental as well as radical changes when (i) organizational participants disagree about the nature of the problem that a system is supposed to solve; (ii) there is uncertainty about whether a particular proposed system will solve the problem; and (iii) the power bases involved are highly valued and in short supply. Grover[10] (1988) suggested organizational strategies and mechanisms needed to deal with resistance and the likelihood of such political game playing during implementation.

Saraph[29] (1989) work provided measures for assessing managers' perceptions of quality management practices at the organizational level. It initiated survey-based research in developing scales to measure the key dimensions of quality management. Sila and Ebrahimpour[30] (2002) empirically derived TQM factors using factor analysis. The derived factors were on customer satisfaction, leadership, top management commitment, employee training, employee involvement, teamwork, continuous improvement, innovation, quality system and performance measurement. Glover[9] (1993) recognizes that TQM requires a true organizational transformation. The most common reason of TQM failure is due to TQM becoming extra work instead of a new way of doing things. The failures of TQM could be due to conceptual weakness, design flaws, or ineffective implementation. (Similar to Lewin's[21] (1951) theory of change). In addressing why transformation efforts fail, Kotter[18] (1995) identified eight common management errors: (i) not establishing a sense of urgency; (ii) not creating a powerful enough guiding coalition; (iii) lacking a vision; (iv) not communicating the vision; (v) not empowering others to act on the vision; (vi) not planning for short-term wins; (vii) not consolidating improvements and producing more change; and (viii) not institutionalizing new approaches. Van der Wiele and Brown[34] (2002) found that the longer sustainability of incremental changes get affected by management-related factors – like the CEO tenure, strength of executive board, prevailing management system, extent to which quality system is integrated into the organization system; impact of the continuity of true implementation of quality management. A similar observation was made earlier by Zhang[36] (2000) in his earlier study conducted by taking structured interviews of managers of manufacturing companies, and found that top management commitment had the greatest effect in smooth execution of change process. Leonard and McAdam[20] (2002) reiterated the importance of upper management participation in the quality transformation through their exploration of strategic quality management. Flynn, Schroeder, and Sakakibara[4,5] (1994; 1995) identified seven quality instruments for assessing manager's perception of quality management practices. They found that the quality leadership had the strongest relationship to quality performance.

From this review of the literature, it is apparent that the barriers, found to hinder incremental or radical changes efforts, are linked to effective management of change transformation. Ultimately, it is management's responsibility to plan, lead, and effect the organizational change. (Huq 2005[15], Kotey[17] 2005, Tamimi[33], 2003).

5. DATA ANALYSIS & VALIDATION

5.1 Respondent's Profile. Out of sample of 639, replies were received from 103 respondents, overall response rate of 16%. 41 (40%) replies were from public sector, 8 (8%) replies from defense organization, 32 (31%) replies from management consultants, and 22 (21%) replies were from academicians. All the manufacturing units of public sectors as well of defense units were involved in TQM implementation. Defense organizations are contemplating to implement BPR programme.

5.2 Descriptive Statistics.

(a) Key responses from respondents are tabulated in Table – 2. 82% of the respondents indicated that Government policies itself are the key barriers to bring changes. These are reactive rather than pro-active. 74% respondents indicated that Government policies are more inclined towards step-vise-step incremental changes. These are slow. Majority of the respondents (72%) viewed that the Government organization need changes in strategic planning (policy making) in order to bring radical changes. Also, there is resistance to change by the employees (72% of the respondents indicated). 65% of the respondents indicated that most of the process changes are initiated by the workers, which is not a planned approach. These observations are typically an indicator of 'bureaucracy' taking predominance over 'managerial approach' . Frank[7] (2006) in his paper published in HBR observed, "*There are, however, two qualities of public sector leaders that make such work difficult. First, it is the nature of*

the bureaucrats to respect barriers. Change leaders don't necessarily knock them over; instead they find ways to see over and around them ---.

(b) Table -3 gives the organization strength of Government companies. Over three fourths of the respondents indicated that Government organizations have well defined laid down processes. However 77% of the respondents indicated the outdated hierarchal organization structure, which is slow to absorb the changes and need to be radically changed. 71% of the respondents indicated that the performances of Government companies are being compared with private industries. The respondents favored the requirement of 'cross functional teams' (70%). Labor unions are positively inclined towards bringing radical changes (67%). Frank[(7)] (2006) observed, "*High performing Government agencies do resemble well-run companies. Both have worth goals; well designed rational processes, strict accountability; and effective leaders ---."*

5.3 Factor Analysis

(c) To understand the inter-correlations among 28 variables, factor analysis was carried out. 11 factors were identified accounting, which accounted for 70.3% of the total variation in the observed ratings (Tabulated in Table – 4). From the rotated factor matrix, (Table – 5), we considered those variables and factors which were having loadings above 0.4. Thus the factors were reduced from eleven to six as tabulated in Table – 6.To further assess the internal consistency of the scales, Cronbach's alpha was calculated as an indicator of reliability of the derived factors. Except for factor 1, the Cronbach's alpha values of factors 2, 3, 4, 5, and 6 is less than 0.70. Some researchers have suggested accepting lower alpha value to the extent of 0.5. Therefore, in the selected list of factors, only factor 6 has alpha value less than 0.5. Reliability analysis results along with the factors and its variables are listed in Table – 6.

6. RESULTS & DISCUSSION

A public sector model considers external, internal and market assessment (Figure – 2). We have confined only to those external factors which are solely related processes for understanding, implementing, delivering and managing change. We have not considered the political, socio-economic, as external factors in our study.

We studied the effect of top-down change management, transformational change management, and strategic change management. We confined ourselves solely on the managerial functions with the objective of understanding relationship between observable outcomes and underlying obstacles. Our survey based research is the extension of work undertaken earlier on the barriers to managing quality transformations, obstacles to TQM & BPR implementations.

Frank[(7)] (2006) had identified four obstacles which hinders in converting government organizations to high performing organizations. First, the selection of leaders is not based on their track record in leading large scale change efforts – but on the basis of command of policy and political connections. Second, the average tenure of the appointed leader is 18 to 24 months, so he or she has a limited time to see change effort through. Third, public sectors are less flexible due to rules on areas such as procurement, budgeting, HR. Fourth, in democracy, every initiative is bound to meet someone's disapproval. The failure of achieving successful changes in public sectors could be due to highly bureaucratic processes, conflicts between political interest and objective goals, or a gradual shift from core business, unplanned automation, implementing unplanned/incorrect problem solving tools, or hiding the failure signs.

From the analysis of surveyed data, six underlying obstacles associated with ineffective change management are: (i) organizational barrier, (ii) managerial barrier, (iii) process barrier, (iv) lack of leadership for quality, (v) employees resistance, (vi) lack of customer focus. From the analysis, it emerges that government organizations are less oriented towards customer focus. There is more emphasis on documentation of processes; defining role, responsibility and accountability of managers. The managers are more apprehensive of the penalties for failures rather than rewards for exceptional performance. This inhibits the innovative decisions required from the managers at the time of crisis.

The above underlying obstacles exert differential influence on 'potential undesirable outcome'. By linking obstacles to outcomes, it would assist in determining which obstacles have the most impact on successful implementation of change. This will provide inputs to managers in prioritizing the action plans to decrease the likelihood of failure. The guiding principles in the public sector are identifying the changes, establishing the implementation methodologies, managing the changes, and creating roadmap for sustaining changes that lead to better performance. The difficulty is the challenge of laying a foundation for success in the future while meeting today's challenges. There is a need to consider *entrepreneurial government organization*, which would focus on

results, decentralize authority, reduce bureaucracy, and promote competition both inside and outside the organization. Government's clients are to be considered as *customers* who would be empowered by being able to choose among providers of various services.

Table – 1: Statements on the Questionnaire

Part – One: Statements representing potential barriers to Operation Change

1	Quality is measured by the quantum of products manufactured at the end of the month.
2	Employees are trained in quality improvement skills.
3	There are excess layers of management.
4	Top management is visibly and explicitly committed to quality.
5	Employees are empowered to implement quality improvement efforts.
6	Government policies are slow to bring radical changes.
7	Employees are trained in problem identification, communication techniques and problem solving techniques.
8	Quality parameters are defined by the customer.
9	Quality action plans are often vague.
10	Employees and/or teams are recognized for achievements in quality/process improvement.
11	No planned changes are envisaged for customer relations.
12	Quality is treated as a responsibility of 'Quality Department'.
13	The strategic plan is customer driven.
14	The best practices and/or products of other companies are benchmarked.
15	The Government regulations prohibit effective TQM/BPR implementation.
16	Most of the process improvement is unplanned, and achieved at working level.
17	IT has brought partial networking, MIS, CAD.
18	Employees always have resistant to change.
19	Strategic plans avoid including quality goals.
20	Globalization has no effect on process changes, better technology to be used, higher quality products, cost reduction.
21	Process changes in Government organization occur only by strategic policy formulation.
22	Managers are to be trained of various change techniques - such as BPR, TQM, 6 SIGMA, technology forecast.
23	Radical changes in Government organizations are brought in steps - by piecemeal covering one or few departments.
24	Employee's/Management's compensation is linked to achieving quality goals.
25	Resources are to be reallocated for effective employment of TQM/BPR.
26	Cross functional teams are to be developed.
27	Performance measure criteria are not customer focused.
28	There is no joint planning with suppliers.

Part – Two: Statements representing potential undesirable outcomes to Operations Change

1	Quality improvement efforts rarely meet expectations in terms of desired results
2	There is frequent turnover of employees
3	The high cost of implementing radical changes outweigh the benefits
4	There is frequent turnover of management
5	Technological changes are achieved by replacing older technology/machine by newer technology/machine.
6	Hierarchical structure changes are slow to absorb the changes.
7	Cross functional teams do not exist.
8	Customers compare the services provided by the Government owned industries with the private industries.
9	The existing working style is outdated and needs to be radically changed.
10	Everyone in the organization is not customer focused.
11	Quality data (defects cost of quality, scrap, errors) are not used as tools to manage quality.
12	There is ambiguity in acceptance of responsibility for quality by major departmental heads.
13	Feedback data from customers is not used in bringing continuous improvement in quality.
14	Customer's requirements are utilized in formulating the organization's objective, plans, strategy and action.
15	Extent of efforts to recruit quality conscious people is lacking.
16	Attitude of labor unions towards quality improvement and management process is positive.
17	HR department is aligning human resources planning and management using employee related data.
18	Suppliers are involved in the product development process.
19	JIT system is used for vendors to supply items directly.
20	Operators carry out self inspection of their respective works.
21	Suppliers rating system is strictly in use to grade the suppliers.
22	Suppliers are selected on the basis of quality of their products rather than on price.
23	Suppliers are provided with the technical assistance with respect to the design specifications and product process.
24	Importance attached to quality by the top management in relation to cost and schedule objectives.
25	SPC charts are used to monitor process, and supplier's items.
26	Top management performance is evaluated based on quality performance.
27	Middle management & supervisors performance is evaluated based on quality performance.
28	Quality department has specified role with respect to quality policy, new product development, specifications.
29	Top management attaches importance to cost and schedule objectives.
30	Employees/workers are given specific work skills & vocational training.
31	Quality department is given autonomy in development and implementation of company-wide quality.
32	Purchase department/Material procurement owns the responsibility of poor quality of supplied items.
33	There is no ambiguity in work or process instruction given to employees.
34	The manufacturing process design/process plan is foolproof and minimizes the chance of employee errors.
35	The equipments are periodically put into preventive/predictive maintenance.
36	The supervisors are trained in solving problems or issues related to quality in the division.
37	Acceptance sampling is used to accept/reject lots or batches of work
38	Regular training in the basic statistical techniques (such as data analysis, SPC,etc) in the division as a whole are being organized.
39	Workers and supervisors participate in quality related decisions.
40	Training in the `Total quality management concept' (i.e. philosophy of company-wide responsibility for quality) throughout the division is being imparted.
41	Customers are always satisfied with the quality of products/service.

Table – 2: Responses by Respondents

Serial No.	Statement	Mean (Max Scale 5)	Mean %
1	Government policies are slow to bring radical changes.	4.1	82
2	Performance measure criteria are not customer focused.	3.98	80
3	Quality is treated as a responsibility of 'Quality Department'.	3.9	78
4	Strategic plans avoid including quality goals.	3.79	76
5	Cross functional teams are to be developed.	3.73	75
6	Radical changes in Government organizations are brought in steps - by piecemeal covering one or few departments.	3.68	74
7	There are excess layers of management.	3.64	73
8	The Government regulations prohibit effective TQM/BPR implementation.	3.61	72
9	Process changes in Government organization occur only by strategic policy formulation.	3.61	72
10	Employees always have resistant to change.	3.58	72
11	There is no joint planning with suppliers.	3.43	69
12	Resources are to be reallocated for effective employment of TQM/BPR.	3.43	69
13	Most of the process improvement is unplanned, and achieved at working level.	3.24	65
14	Managers are to be trained of various change techniques - such as BPR, TQM, 6 SIGMA, technology forecast.	3.01	60

Table - 3 Outcome of Change Management

S. No.	Statement - Outcome of Change Management	Mean (scale of 5)	% Mean
1	Technological changes are achieved by replacing older technology/machine by newer technology/machine.	3.9	78
2	Quality department has specified role with respect to quality policy, new product development, specifications.	3.9	78
3	The existing working style is outdated and needs to be radically changed.	3.8	77
4	Hierarchical structure changes are slow to absorb the changes.	3.7	74
5	The manufacturing process design/process plan is foolproof and minimizes the chance of employee errors.	3.6	72
6	Customers compare the services provided by the Government owned industries with the private industries.	3.5	71
7	Importance attached to quality by the top management in relation to cost and schedule objectives.	3.5	71
8	Training in the `Total quality management concept' (i.e. philosophy of company-wide responsibility for quality) throughout the division is being imparted.	3.5	71
9	There is frequent turnover of management	3.5	70
10	Cross functional teams do not exist.	3.5	70
11	Attitude of labor unions towards quality improvement and management process is positive.	3.4	67
12	The equipments are periodically put into preventive/predictive maintenance.	3.2	64

Table - 4: Factor Analysis – Eigen Values			
Factor	**Eigen Values**	**% of Variance**	**Cumulative %**
1	3.29	11.8	11.8
2	2.60	9.3	21.1
3	2.18	7.8	28.9
4	2.04	7.3	36.1
5	1.78	6.4	42.5
6	1.67	6.0	48.5
7	1.41	5.0	53.5
8	1.29	4.6	58.1
9	1.20	4.3	62.4
10	1.11	4.0	66.4
11	1.10	3.9	70.3

Table - 5: Rotated Factor Matrix - Principal Component Method											
	Factor										
Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1	-0.315	0.278	-0.270	0.449	-0.040	0.115	0.088	0.038	0.475	-0.007	0.031
2	-0.103	-0.275	0.267	-0.337	-0.041	0.001	-0.112	0.597	0.285	-0.053	0.097
3	0.586	0.380	-0.085	0.157	-0.037	-0.180	0.014	0.336	0.113	0.132	-0.134
4	0.215	0.690	0.120	0.207	-0.042	-0.218	0.016	-0.094	0.249	-0.054	-0.119
5	-0.177	0.601	0.082	0.309	0.039	-0.347	0.158	0.176	-0.136	0.061	0.156
6	0.478	-0.283	-0.179	0.396	-0.034	-0.050	0.386	-0.119	0.279	-0.059	0.159
7	-0.359	0.320	-0.211	-0.196	0.068	0.494	0.004	0.398	0.048	0.201	-0.016
8	-0.035	-0.093	0.144	0.537	-0.549	0.114	-0.166	0.001	0.126	-0.112	-0.187
9	-0.109	-0.438	0.372	-0.158	0.298	-0.116	-0.086	-0.117	0.410	0.071	-0.215
10	-0.256	-0.150	0.191	-0.253	0.342	-0.136	0.421	0.060	0.056	0.297	-0.435
11	-0.457	0.117	0.238	-0.188	-0.293	-0.005	0.335	0.198	0.058	0.044	0.414
12	0.346	-0.135	0.350	0.081	0.022	0.126	-0.178	-0.011	0.150	0.368	0.497
13	0.482	0.004	0.502	-0.131	-0.250	-0.132	0.148	-0.100	-0.154	-0.002	0.134
14	0.052	0.048	0.445	-0.145	-0.457	0.000	0.129	-0.063	-0.090	0.229	-0.008
15	0.430	0.319	0.139	0.192	0.008	0.258	-0.214	0.215	0.040	0.184	-0.269
16	0.080	0.238	0.617	0.278	0.349	0.306	-0.003	-0.096	-0.048	0.101	-0.118
17	-0.256	-0.020	0.504	0.449	0.358	0.319	-0.132	0.080	-0.341	-0.089	0.056
18	0.346	-0.014	-0.193	-0.215	-0.440	0.146	0.063	-0.157	-0.063	0.354	-0.131
19	0.474	-0.383	0.039	0.309	0.267	0.087	0.257	0.060	-0.020	0.055	0.227
20	-0.101	0.255	0.405	-0.265	-0.270	-0.141	-0.362	-0.203	0.171	0.038	-0.033
21	0.431	-0.303	0.019	-0.006	-0.116	0.407	0.376	0.014	0.018	-0.068	-0.188
22	-0.038	0.480	-0.119	-0.220	-0.049	0.506	0.366	-0.118	-0.118	0.103	0.026
23	0.624	0.175	-0.078	-0.219	0.174	-0.169	-0.117	-0.017	-0.242	-0.037	-0.108
24	-0.241	0.111	0.157	0.143	0.088	-0.566	0.387	0.089	-0.167	0.126	-0.062
25	0.080	0.423	-0.044	-0.331	0.301	0.146	-0.014	-0.350	0.029	-0.272	0.225
26	0.540	0.016	0.052	-0.191	-0.048	-0.047	-0.019	0.507	-0.161	-0.401	-0.012
27	0.413	0.139	-0.274	-0.167	0.397	-0.132	-0.183	0.016	0.189	0.379	0.205
28	0.223	0.308	0.356	-0.295	0.106	0.109	0.282	-0.063	0.396	-0.393	-0.033

Table - 6 Factorization	
Variable No.	**Statement**
Factor 1: Organizational Barrier (Cronbach's Alpha = .715)	
1	There are excess layers of management.
2	Government policies are slow to bring radical changes.
3	The Government regulations prohibit effective TQM/BPR implementation.
4	Strategic plans avoid including quality goals.
5	Radical changes in Government organizations are brought in steps - by piecemeal covering one or few departments.
6	The strategic plan is customer driven.
7	Process changes in Government organization occur only by strategic policy formulation.
Factor 2 : Managerial Barrier (Cronbach's Alpha = .680)	
1	Top management is visibly and explicitly committed to quality.
2	Employees are empowered to implement quality improvement efforts.
3	Resources are to be reallocated for effective employment of TQM/BPR.
4	Managers are to be trained of various change techniques - such as BPR, TQM, 6 SIGMA, technology forecast.
Factor 3 : Process Barrier (Cronbach's Alpha = .622)	
1	The best practices and/or products of other companies are benchmarked.
2	Most of the process improvements are unplanned, and achieved at working level.
3	Globalization has no effect on process changes, better technology to be used, higher quality products, cost reduction.
4	There is no joint planning with suppliers.
5	IT has brought partial networking, MIS, CAD.
Factor 4 : Lack of Leadership for Quality (Cronbach's Alpha = .522)	
1	Quality parameters are defined by the customer.
2	Quality is measured by the quantum of products manufactured at the end of the month.
3	Quality action plans are often vague.
4	Quality is treated as a responsibility of 'Quality Department'.
Factor 5 : Employees Resistance (Cronbach's Alpha = .489)	
1	Employees are trained in problem identification, communication techniques and problem solving techniques.
2	Employees and/or teams are recognized for achievements in quality/process improvement.
3	Employee's/Management's compensation is linked to achieving quality goals.
4	Employees are trained in quality improvement skills.
5	Employees always have resistant to change.
6	Cross functional teams are to be developed.
Factor 6 : Lack of Customer Focus (Cronbach's Alpha = .113)	
1	No planned changes are envisaged for customer relations.
2	Performance measure criteria are not customer focused.

Historical Development of Manufacturing Methodologies

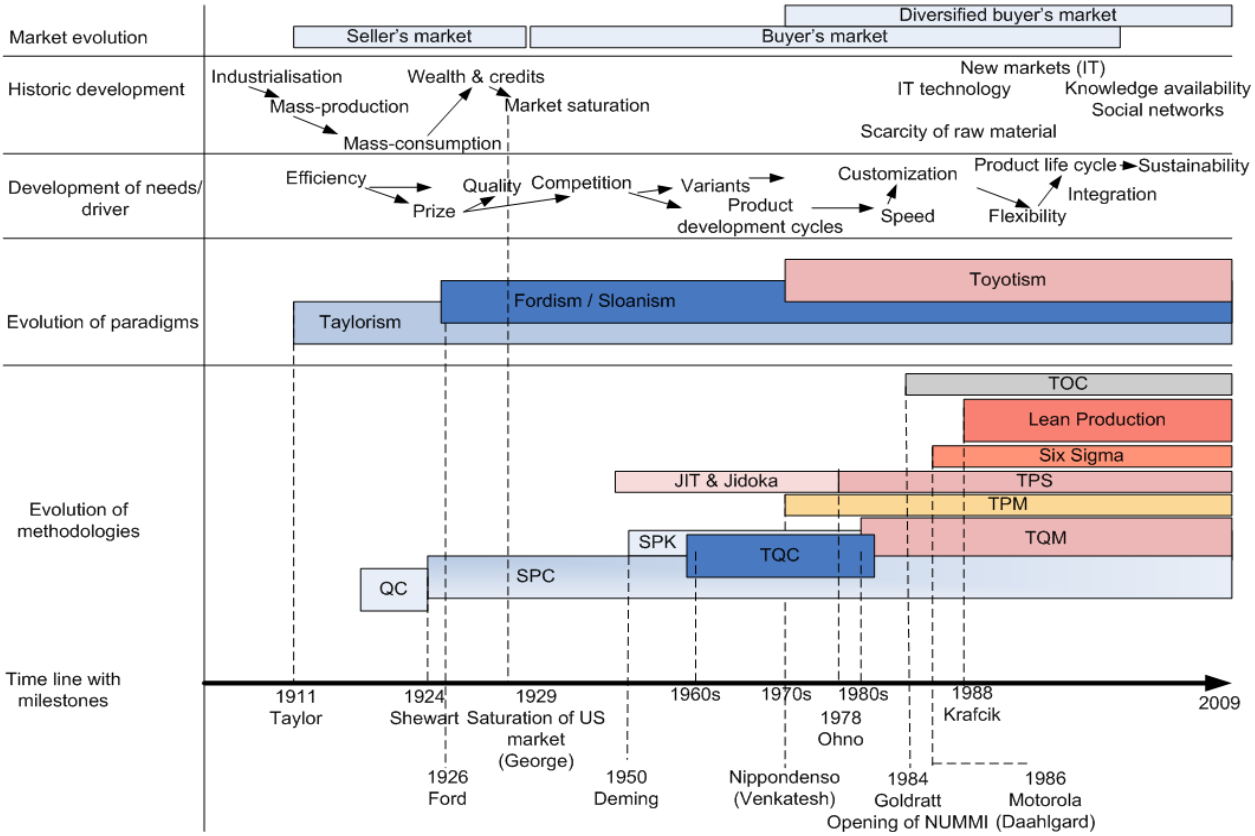

Figure 1: Historical development of manufacturing methodologies and its drivers and needs (Source: Stamm, 2000)

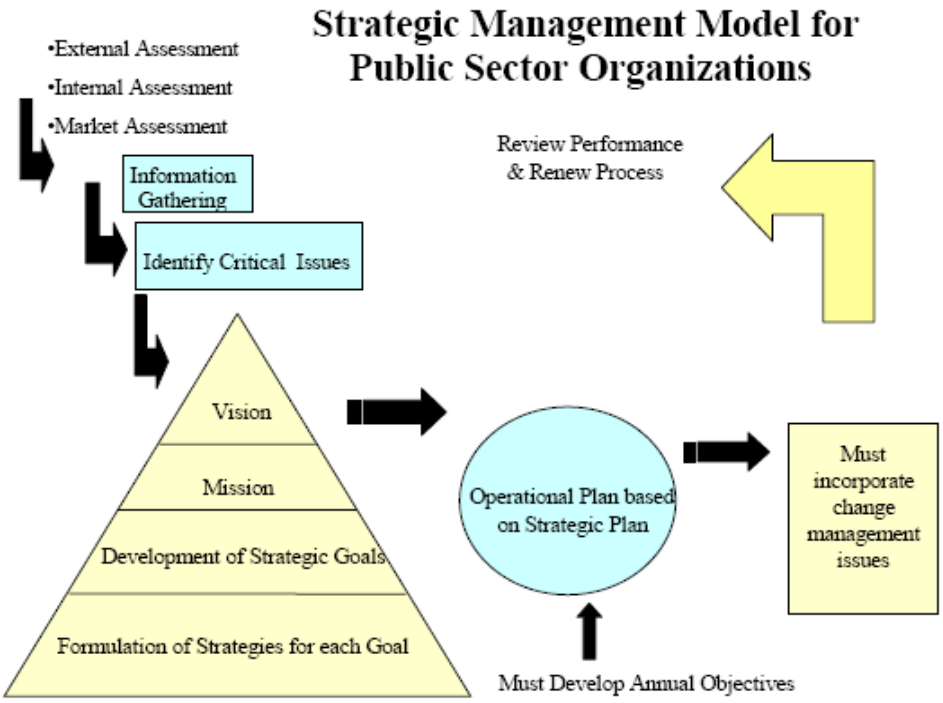

Figure 2: Strategic Management Model for Public Organizations (Source – Bryson 1988)

REFERENCES

1. Bryson, J. M. (1988). Strategic planning for public and nonprofit organizations. *San Francisco: Jossey – Bass Publishers*.
2. Champy, J.A. (1995). Reengineering Management. *Harper Collins, London*.
3. Cummings, T.C, and Huse, E.F. (1989). Organizational Development and Change. New York: West Publishing.
4. Flynn, B. B., R. G. Schroeder, and S. Sakakibara. (1994). A framework for quality management research and an associated measurement instrument. *Journal of Operations Management*, 11, 339-366.
5. Flynn, B. B., R. G. Schroeder, and S. Sakakibara. (1995). Determinants of quality performance in high- and low-quality plants. *Quality Management Journal* (Winter), 8-25.
6. Fok, L. Y., S. J. Hartman, A. L. Patti, and J. R. Razek. (2000). Human factors affecting the acceptance of total quality management. *International Journal of Quality & Reliability Management*, 17, 714-729.
7. Frank Ostroff. (2006). Change management in government. *Harvard Business Review, May*.
8. Ginzberg, M.J. (1981). Early diagnosis of MIS implementation failure: promising results and unanswered questions. *Management Science*, 27(4), 459-478.
9. Glover, J. (1993). Achieving the organizational change necessary for successful TQM. *International Journal of Quality & Reliability Management*, 10, 47-64.
10. Grover V; Lederer A L; and Sabherwal R, (1988). Recognizing the politics of MIS. *Information and Management*, 14, 145-156.
11. Grover, V., Fiedler, K.D. and Teng, J.T.C. (1994). Exploring the success of information technology enabled business process reengineering. *IEEE Transactions on Engineering Management*, 41. 3. 276-284.
12. Grover, V.; Teng, J.T.C; and Fiedler, K.D. (1993). Information technology enabled business process redesign: an integrated planning framework. Omega. *The International Journal of Management Science*, 2(4), 433-447.
13. Grover, V.; Teng, J.T.C; and Fiedler, K.D. (1995). Technological and organizational enablers of business process reengineering. In V. Grover and W.J. Kettinger (eds.). *Business Process Change: Concepts, Methods and Technologies.* Hardsburg, PA: Idea Publishing Group, 1995.
14. Hides, M. T., Z. Irani, I. Polychronakis, and J. M. Sharp. (2000). Facilitating total quality through effective project management. *International Journal of Quality & Reliability Management*, 17, 407-22.
15. Huq, Z. (2005). Managing change: a barrier to TQM implementation in service industries, *Managing Service Quality*, Vol. 15 No.5), pp.452-69.
16. Johnson, T. (2007). *Lean Dilemma: Choose System Principles or Management Accounting Controls,* . IN STENZEL, J. (Ed.) *Lean Accounting: a living systems approach to lean management and learning.* New York, John Whiley.
17. Kotey, B. and Slade, P. (2005). *Formal human resource management practices in small growing firms*, Journal of Small Business Management, 43(1), 16-40.
18. Kotter, J. P. (1995). Leading change: Why transformation efforts fail. Harvard Business Review (March-April): 59-66.
19. Kuei, C. H., C. N. Madu, C. Lin, and M. H. Lu. (1997). An empirical investigation of the association between quality management practices and organizational climate. *International Journal of Quality Science*, 2, 121-137.
20. Leonard, D. and R. McAdam. (2002). Developing strategic quality management: A research agenda. *Total Quality Management*, 13, 507-522.
21. Lewin, K. *(*1951). Field Theory in Social Science. *New York: Harper and Row*.
22. Mann, R., and D. Kehoe. (1995). Factors affecting the implementation and success of TQM. *International Journal of Quality & Reliability Management*, 12, 11-23.
23. Markus, M.L. (1983). Power, politics and MIS implementation. *Communications of the ACM*, 26(6) 430 – 444.
24. Matta, K., J. Davis, R. Mayer, and E. Conlon. (1996). Research questions on the implementation of total quality management. *Total Quality Management*, 7, 39-49.
25. Ngai, E. W .T., and T. C. E. Cheng. (1997). Identifying potential barriers to total quality management using principal component analysis and correspondence analysis. *International Journal of Quality & Reliability Management*, 14, 391-408.
26. Olian, J. D., and S. L. Rynes. (1992). Making total quality work: Aligning organizational processes, performance measures, and stakeholders. *Human Resource Management*, 30, 303-333.
27. Pfeffer, J. (1981). Power in Organization. *Marshfield, MA: Pitman Publishing*.
28. Salegna, G., and F. Fazel. (2000). Obstacles to implementing TQM. *Quality Progress*, 29, 53-57.
29. Saraph. G. V. P., G. Benson, and R. G. Schroeder. (1989). An instrument for measuring the critical factors of quality management. *Decision Sciences*, 20, 810-829.

30. Sila, I., and M. Ebrahimpour. (2002). An investigation of the total quality management survey based research published between 1989 and 2000. *International Journal of Quality & Reliability Management*, 19, 902-970.
31. SOUZA, W. J. D. (year unknown) *Fordism and its multiple sequels: The re-organization of work in Britain, France, Germany and Japan.*
32. Stamm L Markus. (2000). *TQM, TPM, TOC, Lean and Six Sigma – Evolution of manufacturing methodologies under the paradigm shift from Taylorism/Fordism to Toyotism?*, mstamm@aut.ac.nz.
33. Tamimi, N., and R. Sebastianelli. (2003). Understanding the obstacles to TQM success. *The Quality Management Journal*, 10(3), p. 45.
34. Van der Wiele, T., and A. Brown. (2002). Quality management over a decade (a longitudinal study). *International Journal of Quality & Reliability Management*, 19: 508-523.
35. VOGEL, E. F. (1995). Japan as number one: lessons for America, *New York, Harper and Row.York: Harper Business*.
36. Zhang, Z. (2000). Developing a model of quality management methods and evaluating their effects on business performance. *Total Quality Management*, 11, 129-137.