

**THE QUALITY MANAGEMENT PROCESS IN PUBLIC
ORGANIZATIONS OF CONSTRUCTIONS: DIFFICULTIES IN THE
IMPLEMENTATION WAY**

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Abstract

Efficient management of Engineering departments consists in creating optimal working conditions that would provide qualitative results for all parties involved in their work. This objective can be achieved by organizing activities based on a Quality Management Guide. In practice, however, even well-managed engineering departments encounter a range of obstacles during the running of each project, which results in loss of time, employee dissatisfaction, and unrealized organizational goals. In order to identify how to improve the quality management process, surveys and questionnaires were sent out to 50 individuals from the engineering departments within the municipalities of Israel. The questionnaires were collected and from them, extractions were made in order to find the commonality of successes of Local Authorities. After analyzing the results of the questionnaires, the conclusion was that there was specific commonality which yields In addition, there were daily meetings which gained theoretical and tangible insight on success factors.

Organizing engineering project requires specific regulations and guidelines in order to have successful outcomes. The difficulties that arise have been consistent throughout research conducted, however, the positive results have been studied in further detail. Research found that successes of engineering departments in Local Authorities relied on the overall satisfaction of the employees, time saving when projects were completed sooner and efficient management of financial resources. Employees work harder and there are less problems overall when assigning a project quality manager.

Keywords: *quality; management; public organization; engineering department; success factors; ISO-9000; Quality Management Guide; quality management system*

1. Introduction

Employers, which are providers of work, are usually differentiated in industrial relations systems depending upon whether they are in the private or public sector. Historically, trade unionism and collective bargaining developed, first, in the private sector, but in the recent years these phenomena have spread to many public sector settings as well [1, p. 1], [2, p. 6]. One of the most problematic issues in organizational changes is resistance to change. This issue was widely reviewed in the research literature. Humans by their nature need a sense of security. Stability and maintaining the status quo contribute, often in a misleading manner, to such a sense. Therefore, organizational changes create resistance, which finds expression in active ways, in protest and direct confrontation, and/or in lack of cooperation. Employees are satisfied and willing to work harder and more efficiently if there is employee involvement in the project. Delegating work to employees without communication on a closer-level will result in issues and obstacles along the way.

The novelty in this context is that ISO-9000 is a new model used by municipalities and this was the first time it was introduced by the Departments of Engineering of Local Authorities. Implementing a quality guide in the engineering departments also produces ease in the success of the workplace. In the research, an attempt was made to map the major objectors, the level of objection, the major reasons for the objection and ways to deal with them. The results show that time and money are saved when there is a quality guide and quality management involved. The money people invest should not be wasted, nor should employee's work be undermined and undervalued.

2. The degree of investigation of the problem currently, and purpose of research

Numerous books and articles have been written which attempt to define, explain and illustrate these subjects related to the Quality. An Israeli CEO of a construction company or a public organization, who is genuinely interested in improving the performance of his company or organization, will often encounter vague wording, unclear and rather general definitions, and examples that are not necessarily similar to what is happening in his company or organization [4, p. 463]. According to Sui Pheng Low & Joy Ong: "Intensifying global competition and increasing demand by clients for better quality have caused more and more companies to realise that they will have to provide quality products and/or services in order to successfully compete in the marketplace" [12, p. 8]. International Standard ISO-9000 largely answers these questions by listing the minimum requirements necessary to establish a quality system in any organization. This, perhaps, is one reason why the standard ISO-9000 has become the new object of companies and organizations in the Israeli domain of construction interested in improving quality [13, p. 19].

The implementation of a quality guide is often accompanied by difficulties and resistance from many parties. Quality managers responded that, for the most part, it was a request from upper management that resulted in these procedures. Others indicated that it was good that there was debate about every procedure and section. A large number of the changes involved some procedures that were cancelled and replaced out of concern they would create problems in the long run. Some managers started with minimum inspections and reviews, and with time, expanded these inspections and reviews. Other managers indicated that the standard is not suitable for engineering departments of local authorities, and that it was difficult to apply it for managing engineering projects. Another problem was the existing procedures themselves. Some partners in the engineering projects have already prepared procedures and forms, and have an interest in applying the material they prepared for the Local Authority, thus the problem of coordination between various procedures occurred. Implementing a quality guide in the engineering departments also produces resistance. In the research, an attempt was made to map the major objectors, the level of objection, the major reasons for the objection and ways to deal with them.

3. Applied methods

The research started when the author spent over 20 years as an Engineer in a Local Municipality. With years of experience and difficult situations, the positive outcomes stood out and became

model points throughout the years. The author decided to begin research by sending questionnaires and surveys to other engineers who worked in Local Municipalities to conclude the reasons for their successes. The questionnaires concluded success metrics, highlighted specific points and showed how successful they were in the Engineering field. The success factors were also set. The author correlated between the success metrics and success factors, respective to those points that had high success metrics.

Throughout the author's research, the basis of each company's success in project management became clear. The metrics that the author uses in his research were studied very closely to optimize the pros and cons for the final results. The author sought to study the reasons and work environment to realize the success factors which yield the best work for employees of a company.

Index of Success Metrics: Length of implementation, changes in organizational culture, resistance and difficulties in work according to standard, amount and volume of procedures, improvement in performance of the authority, reduction in the number of clients' complaints, improvement of project performance, and recommendations and satisfaction. The author gave a percentage weight for every metric, and a grade for every metric for the studies conducted. The author checked the Index of Success Factors for each Local Authority. Following this, the author studied the factors which are connected to the success of the Local Authority.

The index of success factors played a major role in the research. Index of Success Factors: involvement and commitment of management, experience with quality, motives for implementations, involvement of employees, impact of the quality manager, deadline or timetable, and instructions and multiple-participant meetings. The author examined the success factors in every Local Authority and conducted tests. The intervene levels of the higher management was studied in relation to company involvement and success. Following this, the tests were compared with the success factors of each Local Authority. The author sought to see if there is a correlation for the rate of success levels, respectively. The author found the most significant factors that play the strongest role of success. Interviewees were asked if there were difficulties in working according to procedures and if so, what they were [7, p. 47]. Another question was who, besides the employees and managers of the engineering department, resisted the procedures. Interviews aimed to answer who these were and why they resisted.

4. Resistance to Implementing a Quality Guide

Resistance to establishing a quality guide of any type is expressed through protest or non-performance of procedures. Almost all quality managers indicated that the resistance issue was the main difficulty in establishing a quality guide, with resistance taking the following forms, as the managers noted: there was no reporting on incompatibility issues; service suppliers did not collaborate [3, p. 51]; there was a conceptual difficulty to always go from the office to the site with checklist paperwork; process control was not performed as required; forms were filled out in a retroactive manner; there was a problem of not completing forms; workers and officers claimed the system was not applicable and not suitable for the engineering branch, and project managers and supervisors requested instructions.

Table 1 presents the distribution of resistance by group. The questionnaire had a question about who in the engineering department objected to quality procedures. The responses revealed a number of opponents as shown in the table below.

Table 1. Distribution of Resistance by Group in Engineering Departments

Opposing Group	Workers	Inspectors / Planners	Project Managers	Consultants & Other
% in Authorities	40%	20%	30%	10%

Source: Author's research

Resistance from engineering department workers speaks for itself. This is due to the fact that these department workers are the primary bearers of the workload related to implementation. Inspectors and project planners come next in this regard as they are the secondary bearers of the workload. In a conversation, one authority engineer noted that one planner quits the project upon knowing that the quality guide would obligate him to meet the authority's schedules. Further, a number of planners requested that the quality procedures of the authority matched the planner's quality procedures. Looking into the objectors' experience, it became clear that it carries significant weight, as demonstrated in the pursuant table showing breakdown in percentages of the resistance component by experience in the authority [4, p. S469].

Table 2. Distribution of Resistance by Group in Engineering Departments

Resistance Group	Yes	No
Resistance percentage of workers / managers with experience	77%	23%
Resistance percentage of workers / managers without experience	54%	46%

Source: Author's research

From the table, it can be seen that the resistance of experienced workers or managers is much higher than that of inexperienced workers or managers. The reason for this is clear; experienced workers or managers have the power to object. Inexperienced workers or managers simply want to integrate and perform what is required from them, as they are interested in satisfying their supervisors otherwise they get fired [4, p. S469]. Resistance to procedures becomes evident in non-cooperation, which is their main form of objection to the implementation of a quality guide. Various suppliers object to the quality procedures, as stated earlier, since they have their own internal procedures, and the quality procedures of the authority impose an additional burden on the supplier. In interviews with authority engineers, and in response to an open question, they provided the following as reasons for resistance, along with ways to deal with these reasons.

First, the next reasons were mentioned: nonparticipation in written procedures leads to more objections; a conceptual difficulty in making the documentation turnaround; laziness; old habits; fear of bureaucracy, and change itself produces objection. Now the ways to deal with them: much more involvement in the writing process by those in the project management process; pressure and coercion on the part of management; creating a healthy competitive atmosphere; changing and cancelling procedures according to the requirements and feedback from the site; clear definition in contracts stating that various contractors must have accreditation; writing concise procedures that are easy to apply.

Two tables follow, one providing a summary of the reasons for resistance and the other of ways to deal with them.

Table 3. Reasons for Resistance

Item	Reason	Workers	Managers	Inspectors / Suppliers	Planners
a.	Status and power	20%	35%	10%	30%
b.	Ideology, do not believe in change	35%	33%	25%	31%
c.	Not understanding the process and its results	55%	72%	66%	15%
d.	Fear of not being up to the task	56%	26%	44%	65%
e.	Other	10%	15%	22%	20%

Source: Author's research

It is discernible from examining the above table for resistance reasons that “not understanding the process and its results” is the central component for objection. Workers, project managers and also planners indicated this in high numbers. In addition, the “fear of not being up to the task” and the pursuant reviews was another motivation for resistance. Planners fear they will not receive additional work, while workers and project managers fear they will be reprimanded.

The “status and power” component received low results, which percentage in the author's opinion, is not accurate. It is possible that they did not emphasize this so that it does not appear as “capitulation” on their part [5, p. 153].

Table 4. Ways to Deal with Resistance

Item	Way	Workers	Managers	Inspectors / Suppliers	Planners
a.	Guidance and explanation	90%	85%	80%	60%
b.	Participation and involvement	80%	70%	80%	65%
c.	Providing support and assistance	65%	45%	25%	27%
d.	Pressure and coercion	40%	20%	46%	40%
e.	Other	5%	14%	25%	22%

Source: Author's research

It is evident that dealing with resistance through “guidance and explanation” greatly softens the resistance. Authority engineers and quality managers responded in high percentages that guidance and explanation resolves a large portion of the resistance, and that is what they plan to do. In the second place came “participation and involvement”. The workers screamed “give us pride”, and rightfully so, after all, as noted in the literature survey, the involvement of the workers in procedure preparation has significant weight. Here too, “pressure and coercion” were not a solution to soften resistance, but in fact it leads to the implementation failure of the quality guide by the local authorities. In another research by Donaldson Gay [6, p. 35]. “Staff are highly motivated, meaningfully involved in the development of the service and enjoy a high level of professional satisfaction. Staff are well prepared for future leadership responsibilities through their involvement in secondments, projects and programmes. They have good opportunities for career development

and access to a clearly understood continuing professional development (CPD) programme. They consider that the opportunities for development support their performance effectively and contribute to developing their professional competence. Staff report positively about the quality of support provided by central services and external agencies. Staff are confident in their ability to carry out their duties and engage in effective teamwork at all levels. They are deployed appropriately and feel engaged and valued within the authority”.

Summary: The above two tables show that non-involvement of the workers and managers in the implementation process brings about resistance to working under the guide. It was preferred to involve them in the guide preparation and of course in the guide implementation. Guidance and involvement are the solution to softening resistance to the quality guide [4, p. S470].

5. Results and discussions

Most local authorities indicated that it was indeed difficult to work according to procedures, the main claim being time consumption and difficult to handle paperwork. In other words, the essence of working with procedures and the essence of working with a quality guide are burdensome. The quality system includes about 50 primary forms, and about another 20 secondary forms. As well, there are about 30 internal procedures and another 15 procedures for projects on average. Further, there are checklists and inspection forms, which add significant work for the staff. The table below details the number of authorities which pointed out difficulties whatsoever in working with a quality guide.

Table 5. Authorities and Difficulties Working with a Quality System

	Minor Difficulties	Partial Difficulties	Many Difficulties	Too Difficult
Local Authorities with Full Certification (10)	2	3	7	3
Local Authorities with Partial Procedures (8)	4	2	2	0

Source: Author's research

According to the table, most authorities have difficulty in working with a quality guide. Although only 3 authorities noted the difficulties as minor, checking another response about the extent of using the quality guide, it was revealed that 2 local authorities used the procedures very little. Therefore, these local authorities either chose to use those procedures applicable to them, leaving the ones not applicable, or they used the procedures whenever it suited them.

Table 6. Combination of Difficulties Working with a Quality System with Frequency of Use

	Minor Difficulties	Partial Difficulties	Many Difficulties	Too Difficult
Difficulty Working with Procedures	3	6	8	6
Frequency of Using Procedures	Daily	Weekly	Monthly	Individual projects

Source: Author's research

The distribution of responses is particularly interesting. When the frequency of using procedures increased, the degree of difficulty grew. It can be summarized that working with a quality guide in local authorities is particularly difficult.

Questions 16 and 19 asked who in authorities resisted working according to the quality guide of the engineering department. Question 16 related to the workers, and question 19 to senior officers.

Table 7. Who Resists Working with a Quality System

Answers to Question 19	Department Managers (2)	Authority Workers (8)	Consultants (4)	-	-
Answers to Question 16	Authority Heads (4)	Elected Officials (2)	Suppliers (2)	Treasury (8)	Department Managers (4)

Source: Author's research

Analyzing this table, it is clear that there is resistance to work according to a quality guide among the employees of the local authorities. Among the junior officials, 8 authority employees (in various departments) responded that Local authority officials resisted the quality guide management of the engineering department, while 4 responded that, in fact, it was the consultants of the authority who resisted the quality management guide of the Local authority. However, secondly, it is revealed that there is resistance even among the senior ranks to the quality guide of the engineering department. The 8 interviewed indicated that the Treasury Department was the worst offender in terms of the quality guide of the engineering department, while 4 persons indicated that in fact the head of the authority opposed resistance. It is unclear why the Treasury Department of the Authority would resist and try to intervene in the engineering department that is performing the task this department needs to work on. Is there anything unclear about the engineering department, possibly budget approvals and reporting to the various government offices providing funding? In-depth clarifications during interviews show that there is really something to say about the treasury department, and every time it is something new. Once they argued that a project had to be done this way and not like the previous project. They attribute the answers and connect the new requirements to an external policy, which is not related to the authority itself but to the body to which the reports will eventually be submitted [8, p. 1].

In addition to this, elected officials and the authority head intervene in the work of the engineering department, and here too, there was an explanation of why they do so. The answer was "politics", as elected officials and the authority head want to please their voters and associates – a purely political commitment that has no place in quality procedures. To sum up this section, there is no shortage of problems in the implementation of quality guides in local administrations, both internal (engineering department dissatisfied workers because of the extra work) and external (elected officials, treasury department for various reasons). In addition to the main difficulties arising from changes in the work schedule caused by the activation of the quality management system, there are also problems, some of which relate directly to the quality guide itself, and some probably apply to any quality management system [9, p. 14].

6. Conclusion

In 10 local authorities, respondents stated that it was “difficult to work on dictation from above”. Project managers and field staff are used to independence in their work, and to relative freedom in their considerations and resultant decisions. Work procedures dictate a manner of operation for different activities, which naturally varied from project to project. For the sake of quality and also uniformity, quality procedures mandate a uniform work for all projects. Moreover, the leadership team has to carry out activities that they have not done before, also through dictation from above. The claim of “dictation from above” can be overcome through involving the management staff in procedure writing [10, p. 49]. Another statement that emerged in the interviewee responses was that it was difficult to implement the quality guide for a project in its early stages. In most cases, the quality guide is implemented in its advanced stages, when the issue arises in applying the quality guide for the phases already performed. A decision must be made which parts of the guide to apply retroactively and which to apply from this phase onward. The concepts of the quality guide are taken from the quality terminology, and many times these concepts are not understood. Sometimes, a word has one meaning in terms of quality and another in the management of construction projects. For example, the word “exceptions” in terms of quality means performance deficiencies and discrepancies, while in the construction project management it means additional work included in the original contract. In order to solve this problem, if only partially, and if interested, two names are assigned to one concept: a name based on the quality terminology and another name in brackets that applies to the construction project management terminology of [11, p. 39]. Yet another problem, probably the most difficult, is the lack of perseverance. Implementing a quality guide must become a thing of habit. Many local authorities prepare quality guides and some of them get relatively easy certification afterwards. When lack of implementation of the guide is encountered during simple analyzes, authorities noted that they (i.e. other local authorities of course) are doing only the minimum necessary to maintain certification.

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Rezumat

Managementul eficient al departamentelor inginerie constă în crearea condițiilor optime de lucru care ar asigura rezultate calitative pentru toate părțile implicate în activitatea acestora. Acest obiectiv este posibil a fi realizat prin organizarea activităților pe baza unui Ghid de management al calității. În practică, însă, chiar și departamentele inginerie bine gestionate întâlnesc o serie de obstacole în timpul derulării fiecărui proiect, ceea ce are ca rezultat pierderea de timp, nemulțumirea angajaților și obiective organizaționale nerealizate. În scopul identificării modalității de eficientizare a procesului de management al calității a fost utilizată chestionarea a 50 de lucrători a departamentelor inginerie din cadrul municipalităților din Israel. Obiectivul respectivei cercetări constă în identificarea factorilor de succes care sunt comuni pentru departamentele inginerie din municipalități, în baza cărora ar putea fi proiectat un eficient model al sistemului de management al calității pentru acest tip de organizații.

În urma analizei rezultatelor chestionării s-a constatat că pentru a asigura reușita unui proiect ingineresc acesta trebuie organizat și derulat în baza unor reglementări și ghiduri de acțiune minuțios elaborate, care trebuie să elimine posibilele dificultăți în realizarea proiectului ingineresc. Cercetarea întreprinsă a constatat că succesele departamentelor de inginerie din autoritățile locale se bazează pe satisfacția generală a angajaților, organizarea judicioasă a timpului de muncă și eficiența gestionare a resurselor financiare. Mai mult ca atât, un proiect ingineresc are mai multe șanse de reușită în cazul în care i se atribuie un manager de calitate de proiect.

Cuvinte-cheie: calitate; management; organizații publice; departament inginerie; factori de succes; ISO-9000; ghid de management al calității; sistem de management al calității

Аннотация

Для эффективного управления инженерных департаментов необходимо создать оптимальные условия труда, обеспечивающие качественные результаты для всех заинтересованных сторон, участвующих в их работе. Эта цель может быть достигнута путем организации деятельности на основе Руководства по управлению качеством. На практике, однако, даже хорошо управляемые инженерные департаменты сталкиваются с рядом препятствий в ходе реализации каждого проекта. Это в конечном итоге приводит к потере времени, к неудовлетворенности сотрудников, а также к не реализации организационных целей. Для того чтобы определить, как оптимизировать управление качеством нами было реализовано анкетирование 50 работников инженерных департаментов муниципалитетов Израиля. Целью данного исследования является выявление факторов успеха, которые являются общими для инженерных департаментов муниципалитетов, на основе которых можно было бы спроектировать эффективную модель системы менеджмента качества для данного типа организаций.

В результате предпринятого исследования было установлено, что для обеспечения успеха инженерных проектов, требуется их организация и продвижение на основе тщательно разработанных правил и руководств к действию, которые должны устранить возможные барьеры при их реализации и внедрение. Данное исследование показало, что успех инженерных департаментов в местных органах власти должно основываться на общей удовлетворенности сотрудников, научной организации рабочего времени и эффективном управлении финансовыми ресурсами. Более того, инженерный проект имеет больше шансов на успех, если ему назначен менеджер по качеству проекта.

Ключевые слова: качество; управление; публичные организации; инженерный департамент; факторы успеха; ISO-9000; руководство по управлению качеством; система управления качеством

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