

R1
230
c.1

ASSESSING THE ATTITUDE OF
INFORMATION SYSTEM MANAGERS
TOWARDS TOTAL QUALITY MANAGEMENT

A Research Topic
Presented To The Graduate Faculty
Lebanese American University

In Partial Fulfillment
of the Requirements for the Degree of
Master of Business Administration

By
Marie - Thérèse Rizk
June 1997

Lebanese American University

Beirut - Lebanon

Approval Of Research Topic

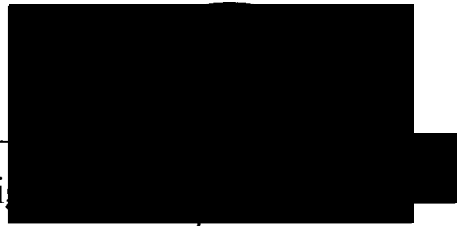
CANDIDATE : Marie - Thérèse Rizk
DATE : June 1997
DEGREE : Master of Business Administration
TITLE OF RESEARCH : Assessing The Attitude of Information System
Managers Towards Total Quality Management

The following professors nominated to serve as the advisors of the above candidate have approved her work

Dr. Hussin Hejase

Name

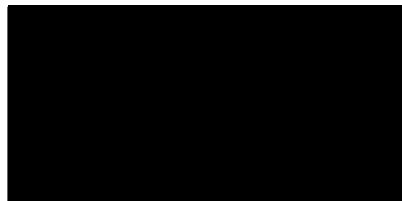
Signature



Dr. Ali Hejase

Name

Signature



To my parents and my brother
for their love, support, patience
and encouragement

ACKNOWLEDGMENTS

I wish to thank Dr. Hussin Hejase for his generous contribution to this work. It was only through his support, patience and constant advice that this research was accomplished. I also would like to extend my gratitude to Dr. Ali Hejase for his valuable coordination.

Special thanks are due to Dr. Ghazi Abdelnour for his most appreciated help in editing.

Finally, I would like to thank all my friends for their precious help in many different ways, and most specially Miss Randa Yazbeck for her wonderful and invaluable support through all of my studies for this MBA degree.

TABLE OF CONTENTS

<u>CHAPTER</u>	<u>Page</u>
1. Introduction	1
1.1 Quality Products and Quality Management	1
1.2 Need For The Study	2
1.3 General Statement Of The Problem	3
1.4 Research Questions	3
1.5 Purpose Of The Study	4
1.6 Limitations Of The Study	4
1.7 Construction of the study	4
2. Review Of Literature	5
2.1 Introduction	5
2.2 Total Quality Management (TQM) Defined	7
2.2.1 Customer Satisfaction (internal and external)	7
2.2.2 Employee Involvement and Satisfaction	9
2.2.3 Focus on Leadership and Team Management	10
2.2.4 Continuous Improvement and Control	11
2.3 TQM Implementation	12
2.3.1 Customer Satisfaction (internal and external)	13
2.3.2 Employee Involvement and Satisfaction	13
2.3.3 Focus on Leadership and Team Management	15
2.3.4 Continuous Improvement and Control	15
2.4 Benefits Of TQM.	16
2.5 Drawbacks Of TQM	17

<u>CHAPTER</u>	<u>Page</u>
3. Procedures And Methodology	18
3.1 Methodology Used In Data Collection	18
3.2 Population And Sample Selection	19
3.3 Measurement of variables	20
3.4 Methodology In Data Analysis	23
4. Findings Of The Study	24
4.1 Organization Demographics	25
4.2 IS Managers' understanding of TQM	28
4.3 Benefits Realized Through TQM	30
4.4 Potential Usefulness of TQM	35
4.5 Possibility of implementing TQM	37
5. Summary And Recommendations	41
5.1 Summary	41
5.2 Recommendations	42
5.3 Implications for future research	43
Appendix A	44
Bibliography	52

LIST OF FIGURES AND TABLES

<u>FIGURE</u>	<u>Page</u>
2.3.1 Establishing a TQM Program	14

<u>TABLE</u>	<u>Page</u>
4.1 Organization Demographics	26
4.2 IS Manager's TQM Awareness	29
4.3 Awareness of TQM Concepts/Tools	30
4.4 Benefits Realized by Organization and IS Function	31
4.5 Hypothesis t-tests of Benefits Realized by Organization and IS Function	33
4.6 TQM Benefits Realized by IS Function Over Time	34
4.7 TQM Concepts/Tools Useful to Organization/IS Function	35
4.8 Possibility of Implementing TQM Concepts/Tools in Organization/IS Function	37

CHAPTER I

INTRODUCTION

1.1 Quality Products and Quality Management

Quality has always been one of the main concerns of the business world. Effectively, the business world revolves around two major parties: the customer and the organization. The customer always looks for better quality in the products or services he/she buys. He/she asks for long-lasting products, with no defects, and more and more features; and efficient, with greater facility services. As for companies, they introduce ways of control to reduce defects, they make sure that the client's specifications are met. But companies do not only look for better quality products and services. Their concern for quality has to take simultaneously a second direction which is: looking for better quality management tools in order to be able to produce higher quality products especially since we are facing a global market and thus success is more and more difficult to achieve.

Today, customer satisfaction has become a complex issue. For example, the customer is no more satisfied with a machine that produces only high quality products. He/she asks for a machine whose output is of high quality, which is also long lasting, which does not need maintenance every now and then, and which does not have any defects. Moreover, and in order not to lose this customer, the organization has to try to provide him/her with new features before he/she asks for them. Therefore, today's concept of quality does not only mean inspecting the product just before it reaches the customer and making sure that this product or service follows the specifications required. But it also means institutionalizing within the company programs that aim at continually improving the product and the process of production, would provide employees with means to produce quality products and services[6]. In a

sense, make “quality” part of the organization’s goals and look for new managerial tools that would make the company able to produce quality products and services.

This new managerial tool could very well be Total Quality Management (TQM). TQM is a whole package that, if applied properly, would lead to better results. It gives the organization tools to inspect the product before it reaches the customer, to provide him/her with the specifications required. And, in addition, it also gives the company techniques to continually improve the product, and as a result, always introduce new features, to control the process of production so as to reduce defects, to increase the satisfaction of both employees and most important, customers.

However, the organization should have the exact information about the product or service, its defects, the specifications required by the customer, the needs and wants of both the customer and the employee. Consequently, the information system (IS) department plays an essential role in the implementation of quality programs such as TQM. High quality information that is accurate and reliable information are of primary importance in such cases. Hence TQM programs should not only be applied in the organization, but also applied within the IS department. By introducing TQM to the whole organization and to the IS department, the company would be able to face global competition more easily.

1.2 Need For The Study

Today, we are moving into a customer-oriented global market. Therefore, looking for quality management tools has, as mentioned above, become very essential. Of same importance is having quality information to help organizations apply quality programs. And one of the most applied quality techniques nowadays is Total Quality Management. The management of more and more companies have taken the decision to apply TQM programs within the whole organization and more specifically within the IS department, since they are realizing the importance of quality information.

Lebanon is regaining its position as a business center within the Middle East. Plus applying TQM program is essential to face competition. The decision to apply TQM programs within the IS department should be taken by IS managers. Hence, it became essential to assess the attitude of information system managers towards Total Quality Management.

1.3 General Statement Of The Problem

Since the end of the civil war, more foreign companies are encouraged to reopen their offices in Lebanon. This will increase the competition of Lebanese organizations, production as well as service organizations; which implies that Lebanese companies have to start introducing quality programs such as TQM programs.

To be able to introduce successfully a TQM program, an organization has to rely very heavily on information. Employees need to receive and send accurate information about problems, specifications, results, etc. Thus the demand for quality information is increasing.

So IS managers, in production and in service organizations, in Lebanon should be aware of how TQM could improve the quality of information.

1.4 Research Questions

This research tries to answer the following questions:

1. Does the IS manager understand the philosophy of TQM?
2. Does the IS manager believe that TQM can improve the quality of information?
3. Does the IS manager believe that TQM concepts and tools could be implemented within the organizations?

1.5 Purpose Of The Study

The main purpose of this study is to assess the awareness of information system managers of how Total Quality Management could improve the quality of information. At the same time it will try to give a general view about the “TQM situation” in Lebanon regarding managers literacy about it, and its implementation.

1.6 Limitations of the study

The population was selected among production and service organizations in Lebanon. And the sample is the information system managers and administrators. But since proper information system departments are new to Lebanon, only 29 companies were included in the study.

Another limitation is that some selected managers refused to fill in or even read the questionnaire because of lack of time or knowledge in the subject.

1.7 Construction of the study

This study was subdivided into five main chapters. As seen, chapter one introduced the study. Chapter two defines Total Quality Management including how to implement it, what are its benefits and drawbacks. As for chapter three, it describes the procedures and methodology used in this research. Chapter four presents the findings of the study. Finally, chapter five summarizes the findings and presents the recommendations and implications for future studies.

CHAPTER II

REVIEW OF LITERATURE

2.1 Introduction

When buying products or getting services, people have always looked eagerly for quality. In counterpart, sellers always looked for better ways to improve the quality of their products and/or services in order to satisfy the needs and wants of their customers, and thus gain an advantage over their competitors. This permanent two-way search has compelled business organizations to investigate for a quality-oriented managerial approach aiming at the improvement of the quality of products and services. The more so in present day where organizations are facing an international, sometimes global, market and not only a local national market anymore. Step by step, there emerged the concept of TQM which is attracting most attention today in the fields of business organizations.

What is Total Quality Management (known as TQM)? And what are the principles underlying TQM? Several definitions have been offered in the literature. Braithwaite[3] considers that TQM is a “management process to instill a culture of continuous improvement in an organization.” Jablonski[5] defines it as: “A cooperative form of doing business that relies on the talents and capabilities of both labor and management to continually improve quality and productivity using teams.” Lastly, according to Schmidt & Finnigan[13] “Total Quality Management is a new way of thinking about organizations and how people should relate and work in them.”

As for the principles and advantages underlying TQM, every author relates different concepts to TQM. According to Flood[4] the main principles of TQM are:

- “1. There must be agreed requirements, for both internal and external customers.
- “2. Customers’ requirements must be met first time, every time.
- “3. Quality improvement will reduce waste and total costs.
- “4. There must be a focus on the prevention of problems, rather than an acceptance to cope in a fire-fighting manner.
- “5. Quality improvement can only result from planned management action.
- “6. Every job must add value.
- “7. Everybody must be involved, from all levels and across all functions.
- “8. There must be an emphasis on measurement to help assess and to meet requirements and objectives.
- “9. A culture of continuous improvement must be established (continuous includes the desirability of dramatic leaps forward as well as steady improvement).
- “10. An emphasis should be placed on promoting creativity.”

For his part, the Peratec Executive Briefing[9] would consider only six key concepts as follows:

- “1. Customers (external and internal)
2. Never-ending improvement
3. Control of business processes
4. ‘Upstream’ preventive management
5. Ongoing preventive action
6. Leadership and teamwork.”

And finally, Jablonski[5] gives the concepts of TQM as follows:

- “1. Customer Focus.
2. A focus on process as well as the results.
3. Prevention versus inspection.
4. Mobilize expertise of workforce.

5. Fact-based decision making.
6. Feedback.”

These are some of the definitions and principles that can be found about TQM. Every author stresses on the aspect of TQM that he finds most attractive to him and to his way of doing things and managing. But out of all these definitions, and for the purpose of this study, we would derive one all-including definition and key concepts.

2.2 TQM Defined

What is Total Quality Management or TQM? Total Quality Management is a new managerial approach, most attractive today, that uses and “promotes” the abilities of all of its workforce to continuously improve its operations so as to provide its customers with constant quality products and constantly best services possible. [3,5,13]

What are the principles underlying TQM? There are four key concepts that can clarify TQM:

1. Customer satisfaction (internal and external).
2. Employee involvement and satisfaction.
3. Focus on leadership and team management.
4. Continuous improvement and control. [3,4,5,8,9,13]

2.2.1. Customer satisfaction (internal and external).

When we talk about the customer we should distinguish the internal from the external customer. The external customer is the traditionally known customer (or user) to whom the organization sells products or services. It goes without saying that the needs and wants of this customer should be satisfied since he provides the company with its needs (money) to proceed further with its operations.

But in our new managerial approach (TQM), there exists the internal customer, whose satisfaction is just as essential for the success of the organization. The internal customer is the employee who receives a product or a service from another employee - either in another department or in the same department - and he has to complete it so that finally it can be sold to the external customer.

For instance, in a car manufacturing company, the person who polishes the car is the internal customer of the person who paints this car. And the painter's external customer is the client who will eventually buy this car. In this example, both the polisher and the painter work in the same department. If the polisher receives a car that is not completely ready for polishing, his work will be delayed, the complete production and quality of the car will be affected, and the customer will not be pleased. This would result in damaging the company's reputation.

Another example would be in a hospital where one of the internal customers of the pharmacy staff is the nursing staff who delivers medication to patients. Here, we are dealing with two different departments of the hospital: the nursing department, and the pharmacy department. If the nurse does not receive the medication in proper form and time, as she asked for it, she will not be able to provide the proper care to her patient or will at least be delayed in doing so. And this affects the satisfaction (objective and/or subjective) of the patient and consequently affects the well-being (reputation, efficiency) of the hospital.

Parallel to knowing who is my internal and who is my external customer, it is essential to know each customer's requirements of the product (and/or service) he wishes to receive. When one wants to deliver a product or service to a customer and satisfy his needs, one should know what the customer expects. Hence it is essential that one discusses with his/her customer the specifications of the service or product which is asked for. In practical terms, when a person wants to buy a car, he or she has in mind a certain degree of quality and definite specifications that should be expressed to the supplier, and thus make the supplier fully able to provide the desired car. In the same way, our polisher (mentioned above) should discuss with the painter how he expects to receive the car. And the nursing department should provide the

pharmacy department with the expression of its needs: kind of medication, time at which it should receive the medications, their packaging and quantity.

2.2.2. Employee involvement and satisfaction.

The employee is the most essential part of an organization. Without him, the company cannot produce the goods or provide the services that the client asks for, even if it has the needed funds and equipment. And in a TQM company, the worker should be both an involved employee and a satisfied one. He is not just an unmotivated agent present and paid to keep the work running whether incomplete or delayed.

On the contrary, an involved worker is a person who takes part in decision-making and problem-solving. Employees at all levels and across all functions should be involved with the decisions, problems, and objectives, of the company. This involvement of employees would change the attitude of the workers towards themselves and towards the company. It should make them feel as being an integral part of the company, so much that the well-being and even the improvement of the company's efficiency and benefits become one of their personal responsibilities. Hence, they will be satisfied employees at least partially.

Full satisfaction of employees would be the result of several other factors. **First**, a happy employee is someone who receives financial compensation but who also looks for moral and psychological compensation. It is true that a person works in order to make money and is always pleased whenever he/she receives a financial bonus. But not all employees look for just a financial compensation. Some feel more pleased when they are compensated with, for instance, grades that could cumulate and be transformed to a promotion or any other kind of recognition (like giving them shares of stock.)

Second, every human being has within him some potential of personal creativity and year after year acquires more expertise in his/her work. Consequently every person in the company should be encouraged to show his/her expertise and creativity, otherwise he or she would keep them to himself/herself. Thus the

organization should encourage its employees to use their expertise, and allow them to express their creativity. By doing this the business organization would give its employees a better feeling of self-worth and once again increase their moral satisfaction.

So, today in the TQM approach, the worker is someone financially satisfied, encouraged to show his abilities and his expertise, motivated to improve the quality of his job, and knowing that he has a responsibility in the quality improvement of the company he is working with.

2.2.3. Focus on leadership and team management

Leadership and team management are the third group of factors to deal with. A leader is someone who guides or takes risks especially by standing and operating on the front of a group of people. With the TQM managerial approach, managers (i.e. leaders) should be able to coach their employees, i.e. they should shift from an authoritarian attitude to a coaching attitude discussing more, ordering less, and sometimes helping in starting the execution of the job. Moreover, another meaning of leadership is to act as a head and to direct others by persuasion. So, the organization's management personnel should also act like chiefs in deciding to implement TQM and work on explaining at length to its employees this change so as to convince them of its benefits and encourage them to work towards its implementation.

In parallel to leadership, there should be team work in companies implementing TQM. Team work encourages participation and cooperation among employees, reduces rivalry and distrust. And both these characteristics are essential for TQM. Teams could be used for problem solving, for decision making, and for product improvements. But it must be stated here that leaders should train their employees for team work, so as to be able to make these teams operational in the TQM approach. And in order to encourage effectively team work, management should, in turn, be ready to reward teams for efficient work.

2.2.4. Continuous improvement and control.

Since early days all business organizations have been aware that they should, whenever possible, try to improve work performance in order to be able to be more competitive. In a total quality organization, improvement becomes a must at any cost. But present-day understanding of improvement has become clearer.

First, improvement must be continuous, i.e. a company should constantly be looking for better ways to produce its goods or provide its services. It should not wait for the external customer, or the internal customer (employee) to complain, and then inquire about deficiencies. The old principle: "If it isn't broken don't fix it" does not apply anymore; in this approach, it is as if it were replaced by a new principle: "It works, but it is not perfect. Can it be improved?"

Second, TQM improvement means management should try to prevent rather than inspect. This means that management should look for ways to improve the work process so as to prevent any possible or predictable mistakes. It should investigate and check for any variations or irregularities or inconsistencies in the process (of the production of products or services) and try to prevent these variations from turning or leading into mistakes.

After that comes our **third** point which is controlling. Reducing to the minimum the possibilities of making mistakes does not eliminate the necessity of controlling the product or service when it is finished and before delivering it to the client. The presence of control officers or testing departments for checking the product or service whenever it is complete and before delivering it to the customer or user is still necessary and should be done as efficiently as it was done before TQM implementation. But the number of defected products or services to be thrown away should be reduced.

Whenever these principles of continuous improvement and control are continuously applied, then the company should be able to produce better quality. And by producing better quality it would hence be reducing waste, and eventually total cost. It should be noted that this continuous improvement and control does not only

apply to the work process. But it does apply also to the environment of work and to the rewards given to employees.

2.3 TQM implementation

Now that we have a clearer view of what is TQM, we should explore how to implement TQM in our organization and more specifically in the IS function.

But let us first mention that implementing TQM successfully in the organization relies a lot on the availability of accurate and reliable information. If management receives unreliable or inaccurate information, it cannot successfully implement its new managerial approach. And what would actually give the company greater benefits is applying TQM in the IS department.

In fact, before introducing TQM to the IS function, it should be introduced first into the organization as a whole, and then the IS department's management should try to implement it for itself at its own level.

Several steps are required for establishing a TQM program [7]. **First**, management should analyze and assess the benefits of applying TQM, and then decide whether to pursue such a plan or not. If the decision is favorable, it would move to the **second** step: Establishing a quality culture in the organization. By this is meant that the company should motivate, direct and give the adequate resources to its employees so as to encourage them to accept and pursue this new managerial approach. **Thirdly**, the organization should form a steering committee whose members come from different departments, and whose responsibility is to set quality objectives, plans and standards. (Cf. Figure 2.3.1.)

Once the TQM program is launched in the overall organization, the IS function can implement it at its own level. Here again, the IS department should use these same three steps but adapt them to its own format and scope. So, the IS department should first decide whether to pursue TQM after a careful analytical study and assessment of trade-offs. Then, it should introduce the quality culture to its

particular staff. And finally, it should put up a team to prepare for all this quality transformation.

The three above-mentioned steps are essential for the launching of the TQM program. Now, once the program is launched, whether in the whole organization or in the IS function, management should start taking the necessary new measures to ensure that TQM principles are being applied. And these new measures apply in the same way to the global organization as to the IS function. We will take each TQM principle (presented above) and present the new measures that should be made in parallel.

2.3.1. Customer satisfaction (internal and external).

To be able to satisfy the customer, the organization should seek information about the needs and wants of customers (in the case of the whole organization) and users (for the IS department). It could do this through surveys and interviews focused on both the satisfaction level of these clients, and their requirements for quality. Also, this new management should try to develop a closer relationship with these clients so as to be informed about changing requirements and ensure that they are met and even exceeded. This issue is very essential for the IS function, because in this case, user requirements can change very quickly and most of the time they are not very clearly defined even in the mind of the user himself.

2.3.2. Employee involvement and satisfaction.

We said that part of TQM is to involve employees in the work they are doing, to give them power of decision and make them feel that the success of the organization as a whole is part of their personal responsibilities. To do so, management should try to give more power and capacity to its employees to directly solve problems whenever possible instead of asking them to just report non-satisfaction of customers or emergence of problems.

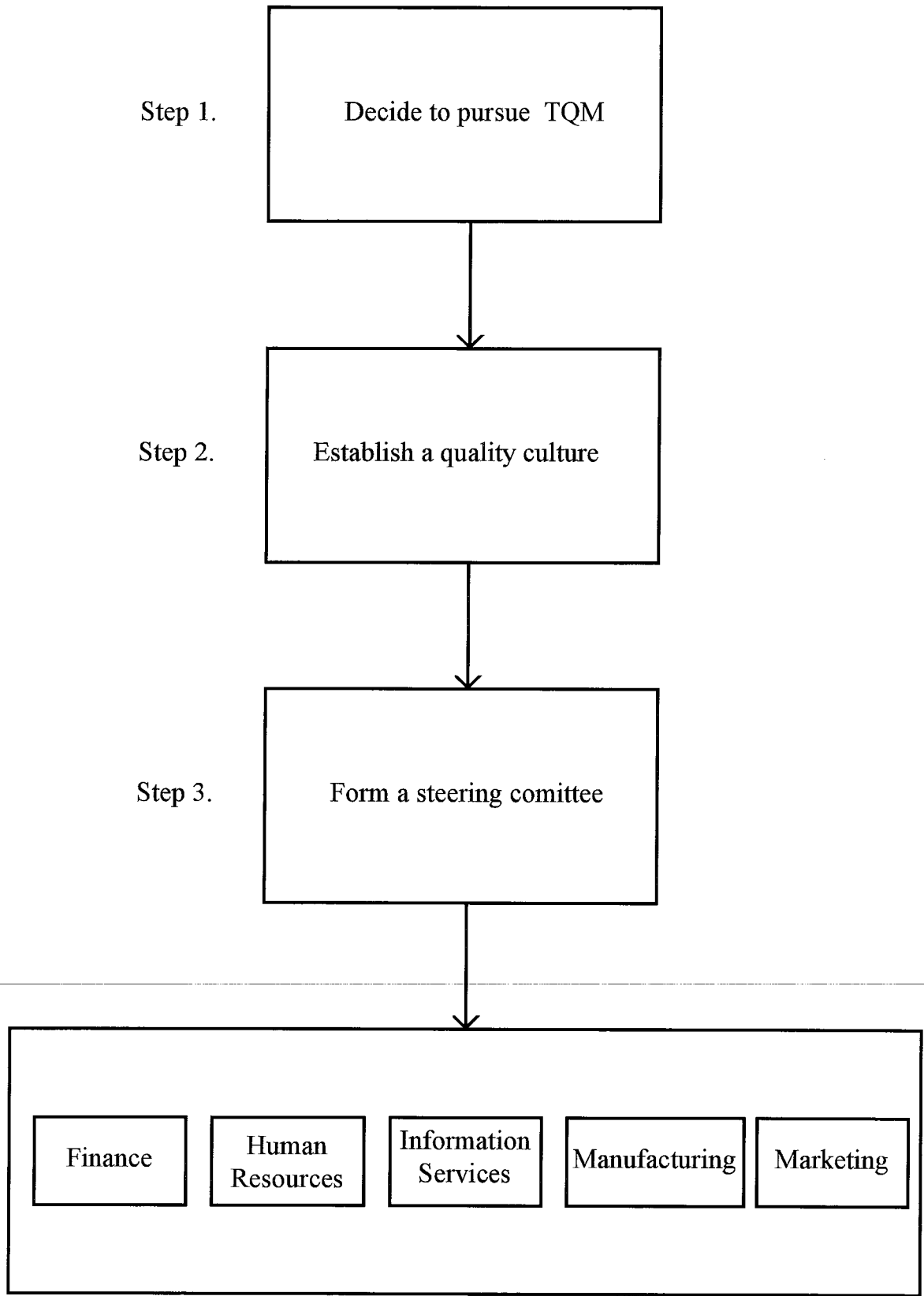


Figure 2.3.1 Establishing a TQM program

A second tool would be to look for new ways to reward employees. Part of TQM implementation, (once again in the overall organization and the IS function), is to shift from the belief that employees only like financial bonuses and aren't creative, to a new way of thinking looking for new rewards (such as promotions or shares of stocks as described above) and encouraging their creativity.

Last but not least, one should effectively involve the employees in all this change by informing them specifically about the new quality standards, encouraging them to personally look for better ways of improvement and keeping them up to date about this quality program: the stage reached, the benefits taken or even the mistakes made and the new steps to take.

2.3.3. Focus on leadership and team management.

As mentioned in the explanation of this principle, to implement leadership the company should become more of a flat organization and reduce the high number of managerial levels (present before the TQM implementation). Besides, and regarding especially the IS function, we said earlier that leadership means coaching, therefore top management who decided to follow a TQM program must always support managers in the IS department when the latter decide by themselves to follow a TQM program in their own division.

Also, implementation of a TQM program means moving to a team managerial approach where decisions are not anymore unilateral decisions but consensus decisions. Once again it is important to mention here that before moving to team management, the organization and the IS function should give proper training about teams.

2.3.4. Continuous improvement and control.

In this case, quality improvement teams could be created for the purpose of looking for new ways to improve the quality of products or services. Also, the company should encourage feedback. Feedback is necessary for improvement because

it allows workers and management to become aware of mistakes and be able to correct results.

2.4 Benefits of TQM

There are several benefits resulting from the implementation of TQM in an organization. And these benefits can be applied both to the whole organization and to the IS function. The most commonly reported benefits realized are the following:

- Improvement of customer satisfaction
- Increase of service and product quality
- Increase of service and productivity.
- Reduction of costs as the result of two elements: **First**, by moving into team management, there will be an elimination of the several management layers, and eventually reallocation of displaced people to needed positions. **Second**, the increase in the quality of doing the work added to the increase of the quality of the product will reduce waste and costs.
- Increase of employee involvement.
- Increase of employee knowledge and skills (expertise). And here also this is due to two factors: **One**, in order to reposition employees in more needed places, training is a must and hence gives the employee better knowledge and teaches him or her new skills. **Two**, being present in teams enables the employees to learn from the experience and know-how of other members, especially that teams are usually made of people from several departments or having different responsibilities (if they do work in the same department).

IBM corporation is one of the examples of success through TQM. IBM ran a quality program in its Havant plant. During this program, the company invested a lot in education and management time. The results were: (1) Reduce manufacturing cycle time by 80%; (2) Decrease in inventory value by 66%; (3) Threefold increase in inventory turnover; (4) Increase of the revenue per person by 8 times.[9]

Another example is the Nissan car manufacturer. The major achievements attributed to TQM were: (1) Increase in productivity and plant capacity; (2) Increase of morale, enthusiasm and teamwork; (3) Continuous improvement has become everyone's responsibility.[9]

2.5 Drawbacks of TQM

While TQM has several benefits but it also has some drawbacks. The TQM program requires lots of changes. And these changes are not easy to implement. It is not easy to ask a manager to move from a directing position to a coaching attitude where this manager could be placed in the same team with some of his subordinates. Therefore if these managers are not totally committed to the program, TQM will fail.

Also, the results of a TQM program are not realized quickly. The experience of companies shows that it took them at least three years, (some five, and some even ten) to start seeing benefits. And not all companies are patient enough to continue the program.

The implementation of a TQM program asks for the removal of management layers and therefore the removal of some employees. It is not always possible to reposition all the employees removed. And this issue could cause fear among personnel whereas TQM counts on reducing as much as possible fear.

Now that the philosophy behind TQM was presented, the impact of TQM in the Lebanese business world is assessed objectively. This is done by first of all presenting to you the procedures as well as the methodology used.

CHAPTER III

PROCEDURES AND METHODOLOGY

This chapter deals with the method used in data collection, the population and the selected sample, the measurement of the selected variables, and the analysis of the collected data.

3.1 Methodology used in data collection

In this research, the questionnaire approach was chosen from among the many other methods of data collection because of:

1. The need to contact as many management information system (MIS) managers as possible.
2. The rapidity of the techniques of questionnaire surveys.
3. The large number of problems to explore.
4. The noncooperation of several managers towards such research since they consider interviews and even fifteen minutes questionnaires as time consuming.

Questionnaires were distributed to IS managers in several organizations (cf. Appendix A.). The purpose of the project was presented to them in an introductory letter. For questions 1 to 11 and 19, the respondent was free to answer in the way he felt adequate. As for questions 12 to 18, he was asked to circle the appropriate answer using the indicated scale. This scale ranged between 1 = Definitely Realized to 5 = Definitely have not realized for question 12 to 13 and, 1 = Definitely belongs to 5 = Definitely doesn't belong for questions 14 to 18.

3.2 Population And Sample Selection

The objective of this research project is to assess the awareness of IS managers of how TQM could improve the quality of information. And since information systems have become part of every kind of organization, therefore the population selected included industry and service organizations within the private and the public sectors.

The questionnaire used for data collection was directed to information system managers and administrators within our population.

These managers and administrators should definitely have a clear idea about the way their own department is managed, and at least a fairly well understanding of the managerial processes applied in the whole organization.

Information systems managers visited are listed below according to the type of organization they belong to.

<u>Organization Type</u>	<u>Number of Managers</u>
Communication	1
Construction	0
Service	1
Commercial	3
Education	4
Public	2
Soft-drink	2
Hospital	5
Industry	1
Food	5
Bank	5

3.3 Measurement of variables

Appendix A shows the used questionnaire and the variables. Each question had several answers and a code was attributed to each chosen answer.

The coding system used for the variables is described below. (Question is abbreviated by Q.)

Q1-Organization's type (industry or service):

<u>Answer</u>	<u>Code</u>
Communication	1
Construction	2
Service	3
Commercial	4
Education	5
Public	6
Soft-drink	7
Hospital	8
Industry	9
Food	10
Bank	11

Q2-Number of people employed in the IS department:

<u>Answer</u>	<u>Code</u>
No answer	1
10 or less	2
11-20	3
21-30	4
31-40	5
41-50	6
Greater than 50	7

Q3-Organization's annual sales dollars (in millions):

<u>Answer</u>	<u>Code</u>
No answer	1
1 or less	2
2-3	3
4-5	4
6-7	5
8-9	6
10 or more	7

Q4-Way of control in the IS function within the organization:

<u>Answer</u>	<u>Code</u>
No answer	1
Centralized	2
Decentralized	3
Some functions centrally controlled and others not	4

Q5-Heard of TQM:

<u>Answer</u>	<u>Code</u>
No answer	1
Yes	2
No	3

Q6-Understanding of the philosophy and concepts of TQM:

<u>Answer</u>	<u>Code</u>
No answer	1
Completely	2
Fairly well	3
Somewhat	4
A little	5
Confused	6

Q7-Impact of TQM on IS function:

<u>Answer</u>	<u>Code</u>
No answer	1
Very significant	2
Significant	3
Moderate	4
Very little	5
No	6

Q8 and Q9-Respectively organization's and IS function's current implementation of TQM:

<u>Answer</u>	<u>Code</u>
No answer	1
Yes	2
No	3
Partially	4

Q10-Top management's support of TQM implementation in the IS function:

<u>Answer</u>	<u>Code</u>
No answer	1
Very supportive	2
Somewhat	3
Less than	4
Neutral	5
Resistive	6

Q11-Period of active implementation of TQM for the organization and the IS function:

<u>Answer</u>	<u>Code</u>
Not at all	1
Less than 1 yr.	2
1-3 yrs.	3
3-5 yrs.	4
Greater than 5 yrs.	5

For questions 12 to 18, each option within the question was considered a variable and coded according to the option chosen. That is, the first variable in question 12 was “Improved customer satisfaction” and it was coded:

<u>Answer</u>	<u>Code</u>
Definitely realized	1
Realized somewhat	2
Neutral	3
Probably have not realized	4
Definitely have not realized	5

The same applies for all the remaining variables and all the following questions up to question 18.

Q19-Comments:

<u>Answer</u>	<u>Code</u>
Comments	1
No Comments	2

3.4 Methodology in data analysis

To be able to answer this research’s questions, descriptive analysis will be used. Raw data will be rearranged, ordered and transformed into a form that will make it easy to understand and interpret.

CHAPTER IV

FINDINGS OF THE STUDY

This research study is concerned with the assessment of the attitude of information system managers towards Total Quality Management. For this purpose, and as mentioned in chapter III a questionnaire has been designed to assess this attitude among IS managers and administrators of industry and service organizations.

The questionnaire was subdivided into five sections as follows:

1. Organization demographics.
2. The respondent's understanding of TQM.
3. The benefits realized within the organization and the IS function after implementing TQM.
4. The potential usefulness of TQM concepts within the organization and the IS function.
5. The possibility of implementing TQM concepts within the organization and the IS function

This chapter presents the findings to the research questions that were presented in chapter one. These questions are:

1. Does the IS manager understand the philosophy of TQM?
2. Does the IS manager believe that TQM can improve the quality of information?
3. Does the IS manager believe that TQM concepts and tools could be implemented within the organization?

Raw data obtained have been sorted out and are presented below in table forms. The results will be first presented for each section separately. Then, the data will be analyzed to answer the research questions.

It is important to mention that the questionnaire was sent to several companies. The response rate was 85.71%. All answered questionnaires were considered usable in this study.

4.1 Organization Demographics.

Organization demographics include the type of the organization, the number of people employed, the approximate annual sales dollars (in millions), the IS structure in the organization, whether the organization and the IS department are implementing TQM and for how many years. All of these variables are included in questions 1, 2, 3, 4, 8, 9, and 11. The results of these questions are provided in Table 4.1.

The respondents are part of industry and service organizations. Eleven different kinds of organizations are included. The highest percentages represent hospitals, banks and food businesses.

44.8% of the respondents are part of relatively small IS departments where a maximum of 10 people are employed.

Regarding annual sales we had 10 missing cases (34.5%). That was due to two main reasons:

1. Some managers consider that such information is confidential and therefore are not willing to answer.
2. Others, working in non-profit organizations, consider that their companies have zero sales figures.

Most of the companies visited are following a hybrid IS structure in the organization (48.3%), whereas 37.9% follow a centralized structure and 10.3% a decentralized one. We also had one missing case because the question was not answered.

Table 4.1
Organization Demographics

	Frequency	Percentage
Organization Type		
Communication	1	3.4
Construction	0	0
Service	1	3.4
Commercial	3	10.3
Education	4	13.8
Public	2	6.9
Soft-drink	2	6.9
Hospital	5	17.2
Industry	1	3.4
Food	5	17.2
Bank	5	17.2
Number of employees		
10 or less	13	44.8
11-20	5	17.2
21-30	5	17.2
31-40	0	0
41-50	2	6.9
Greater than 50	4	13.8
Annual sales (Million \$) (Missing Cases MC = 10)		
1 or less	1	3.4
2-3	4	13.8
4-5	0	0
6-7	1	3.4
8-9	1	3.4
10 or more	12	41.4

	Frequency	Percentage
IS Structure in organization (MC = 1)		
Centralized	11	37.9
Decentralized	3	10.3
Some functions centrally controlled others not	14	48.3
Organization implementing TQM (MC = 1)		
Yes	8	27.6
No	19	65.5
Partially	2	6.9
IS function implementing TQM		
Yes	9	31
No	17	58.6
Partially	3	10.3
Number of years implementing in organization		
Not at all	21	69
Less than 1 year	2	6.9
1-3 years	5	20.7
3-5 years	1	3.4
Greater than 5 years	0	0
Number of years implementing in IS function		
Not at all	19	62.1
Less than 1 year	2	10.3
1-3 years	7	24.1
3-5 years	1	3.4
Greater than 5 years	0	0

It was mentioned earlier that TQM implementation should start at the organization's overall level and once the program is launched within the organization then the IS function can start it at its own level. But according to answers given, eight companies are implementing TQM whereas nine managers answered that the IS function is implementing TQM. This indicates that one IS manager has started implementing TQM while his company was still following the old trend. Moreover, two organizations have partially started their TQM program while three IS managers consider that they have partially started (i.e., we mean that they have only started a training program for the executive level managers.)

In parallel, an analysis of the answers to question 11 shows that most companies and most IS functions are not at all implementing TQM: 69% of organizations and 62.1% of IS functions. Also, most of the organizations (27.6%) and of the IS departments (34.4%) have been implementing TQM for 3 years or less. This implies that TQM is still new in Lebanese organizations and IS departments.

4.2 IS Managers' Understanding of TQM

In this section the respondents' understanding of TQM philosophy and concepts will be studied. This study will determine if they have heard of TQM, how well do they understand its philosophy, what is their perception of TQM's impact on the IS function and finally what are the concepts that they relate to a TQM implementation. All of these variables are included in questions 5, 6, 7, and 14. The answers to these questions are provided in Tables 4.2 and 4.3.

93.1% of IS managers have heard of TQM. More than half of these managers indicated that they understood the philosophy completely or fairly well. And 89.7% believed that TQM can have a positive impact on the IS function.

Most of IS managers regard all the concepts listed in question 14 as belonging to TQM. But according to the presented results some concepts seem to be

more important than others. IS managers give highest importance to “Continual Improvement” and lowest importance to “Concurrent Engineering”.

Table 4.2
IS Managers’ TQM Awareness

	Frequency	Percentage
Heard of TQM		
Yes	27	93.1
No	2	6.9
Understanding of TQM concepts/tools		
Completely	5	17.2
Fairly well	11	37.9
Somewhat	7	24.1
A little	3	10.3
Confused	2	6.9
Perception of TQM impact on IS		
Very significant	6	20.7
Significant	20	69.0
Moderate	1	3.4
Very little	0	0
No	2	6.9

According to the above results we can say that the great majority of IS managers do understand the philosophy of TQM since:

1. Only two managers have not heard of TQM.
2. These two have a confused understanding of TQM.
3. These two believe that TQM does not have any impact on the IS function.
4. Managers’ knowledge of TQM is not related to whether the company or the IS function is implementing TQM because out of the 29 managers visited only 8 are

implementing in the organization and 9 in the IS function whereas 27 believe that all of the concepts listed belong to a TQM implementation.

Table 4.3
Awareness of TQM Concepts/Tools

	Mean	Definitely Belongs	Might Belong	Neutral	Probably doesn't belong	Definitely doesn't belong
Benchmarking	1.83	16	4	7	2	0
Concurrent Engineering	1.90	14	4	11	0	0
Continual Improvement	1.34	23	2	4	0	0
Employee Empowerment	1.76	13	10	6	0	0
Group Decision Making	1.72	14	9	6	0	0
Identifying The Customer	1.76	15	6	8	0	0
Listening To Customers	1.76	15	7	6	1	0
Process Analysis	1.52	19	5	5	0	0
Statistical Process Control	1.69	14	10	5	0	0
Top Management Leadership	1.72	16	6	6	1	0

4.3 Benefits Realized Through TQM

This section presents the benefits realized by the organization and by the IS function after implementing TQM. TQM can provide several benefits to the organization and to the IS function. These benefits were listed in questions 12 and 13. Our analysis of the results will be limited to the respondents who indicated that their organization or their IS department are implementing TQM. Some of the IS managers working within either organizations or IS departments not implementing TQM did answer both questions 12 and 13. But these managers were taken into consideration

their theoretical knowledge of TQM and considering the potential benefits that could be realized. Only managers who are actually implementing TQM can effectively identify the benefits realized.

Table 4.4
Benefits Realized by Organization and IS Function

	Organization (Mean)	IS function (Mean)
Improved Customer Satisfaction	2.0	1.8
Enhanced Quality of Products Delivered	1.8	1.5
Enhanced Quality of Services Provided	1.6	1.5
Lower Maintenance in Developed Application	2.4	2.0
Greater Productivity of IS Personnel	1.9	1.6
Reduced Product Development Time	2.6	2.4
Increased Flexibility in Meeting Customer Demand	2.2	1.9
Better Utilization of Human Resources	2.1	1.5
Better Management Control of IS Function	1.7	1.5

Only eight IS managers indicated that they were implementing TQM in their organizations. As shown in Table 4.4, most of the benefits listed were achieved in their organizations. According to the results presented, the most important benefits were (in order of importance): “Enhanced Quality of Services Provided, Better Management Control of IS Function, Enhanced Quality of Products Delivered, Greater Productivity of IS Personnel, Improved Customer Satisfaction”. And the benefit least realized was: “Reduced Product Development Time”.

As for the benefits realized by the IS function, nine IS managers indicated that their departments are implementing TQM. According to the answers given, all of the benefits listed were realized. Similarly in the case of the organization,

the benefit least realized was: “Reduced Product Development Time”, knowing that the mean was 2.4.

A comparison of the means listed in Table 4.4 shows that IS managers consider that the benefits were more important in the IS departments than in the organizations. This opinion could be explained by several factors:

1. Questionnaires were addressed to IS managers not to the organization’s managers. Therefore answers could be influenced by the IS manager’s subjectivity and bias.
2. In order to be able to answer objectively about the benefits realized by the organization, the IS manager should be involved in his organization’s plans, changes and benefits as much as he is involved in his own department. This is not always the case especially that in Lebanon we are dealing with mostly family-owned businesses.
3. Most of the management information systems departments are new in Lebanon. And as seen earlier, 44.8% of the IS departments visited are relatively small, having at the most ten employees. Thus realization of the benefits could be seen faster than in organizations where many more people are involved.
4. It was mentioned earlier that in some organizations IS departments are implementing TQM while their organizations have not yet started. This fact could be one of the factors explaining the results presented above since nine different cases were considered in the calculation of the benefits in the IS function whereas eight cases for the overall organization..

In order to test whether any significant statistical differences existed between results concerning the organization and those concerning the IS function hypothesis t-tests were performed. The hypothesis “Mean of Organization = Mean of IS Function” was tested and results are presented in Table 4.5. According to the table, calculated probabilities were larger than $\alpha = 5\%$. Therefore, the hypothesis was accepted and no significant statistical differences were found.

Table 4.5

Hypothesis t-test of Benefits Realized by Organization and IS Function

	Organization (Mean)	Organization (Variance)	IS function (Mean)	IS function (Variance)	Degrees of Freedom	t	Probability	Standard Error
Improved Customer Satisfaction	2.0	0.5	1.8	0.70	15	-0.074	0.94	0.38
Enhanced Quality of Products Delivered	1.8	0.29	1.5	0.53	15	0.18	0.86	0.31
Enhanced Quality of Services Provided	1.6	0.27	1.5	0.53	15	-0.58	0.57	0.30
Lower Maintenance in Developed Application	2.4	0.70	2.0	0.61	15	0.60	0.56	0.39
Greater Productivity of IS Personnel	1.9	0.55	1.6	0.50	15	-0.12	0.91	0.35
Reduced Product Development Time	2.6	1.13	2.4	1.25	15	0.08	0.94	0.53
Increased Flexibility in Meeting Customer Demand	2.2	0.57	1.9	0.61	15	0.30	0.77	0.37
Better Utilization of Human Resources	2.1	0.84	1.5	0.78	15	0.16	0.87	0.44
Better Management Control of IS Function	1.7	0.57	1.5	0.53	15	-0.15	0.44	0.36

According to some researchers [8], realization of the benefits could take several years. Therefore, Table 4.6 will present the benefits realized in the IS function in relation to the number of years of implementation. It is important to mention that none of the IS managers who answered that they were implementing TQM in their departments have been doing so for more than five years, only one between three and five years, six between one and three years and two for less than one year.

According to the means listed in Table 4.6, only one (Reduced Product Development Time) out of the nine benefits is “probably not yet realized” after 3 - 5 years of TQM implementation. But it should be mentioned that this is the opinion of just one IS manager. Moreover, since the number of cases available for each period of time are not many (as mentioned in the previous paragraph), results are not very significant.

Table 4.6
TQM Benefits Realized by IS Function Over Time

	Less 1 yr (Mean) (2 Cases)	1-3 yrs. (Mean) (6 Cases)	3-5 yrs. (Mean) (1 Case)
Improved Customer Satisfaction	2.5	1.67	1.0
Enhanced Quality of Products Delivered	1.5	1.50	1.0
Enhanced Quality of Services Provided	1.0	1.67	1.0
Lower Maintenance in Developed Application	3.0	1.67	2.0
Greater Productivity of IS Personnel	2.0	1.50	1.0
Reduced Product Development Time	3.0	2.00	4.0
Increased Flexibility in Meeting Customer Demand	2.5	1.83	1.0
Better Utilization of Human Resources	1.0	1.67	1.0
Better Management Control of IS Function	2.0	1.33	1.0

4.4 Potential Usefulness of TQM

In the preceding section, the benefits of TQM to both the organization and the IS function were discussed in an effort to know whether the IS manager believes that TQM can improve the quality of information within the organization. This section will complete the answer to the preceding question by studying the potential usefulness of TQM according to IS managers.

Questions 15 and 16 of the distributed questionnaire addressed the issue of potential usefulness of TQM in the organization and the IS function respectively. The answers to these questions are listed in Table 4.7. Only 27 cases were considered since two managers indicated that they were not knowledgeable with TQM.

Table 4.7

TQM Concepts/Tools Useful to Organization/IS Function

	Organization (Mean)	IS Function (Mean)
Benchmarking	1.81	1.70
Concurrent Engineering	2.15	1.93
Continual Improvement	1.30	1.19
Employee Empowerment	1.56	1.30
Group Decision Making	1.56	1.48
Identifying the Customer	1.59	1.70
Listening to Customers	1.52	1.63
Process Analysis	1.33	1.15
Statistical Process Control	1.59	1.56
Top Management Leadership	1.59	1.48

To IS managers, all TQM concepts/tools listed are useful for Organizations and IS functions. The most useful tool for organizations is “Continual Improvement”. As for IS functions it is “Process Analysis”.

What is to be noticed in these results is that once again as in the preceding section, IS managers find that most of the concepts listed are more useful in IS departments than in organizations except for two which are: “Identifying the Customer” and “Listening to the Customer”. The same reasons listed earlier could explain the fact that IS function’s means are higher than organizations’:

1. IS manager’s answers regarding organizations can be subjective and biased.
2. IS managers are not enough involved in their organizations plans, changes and benefits since most companies are family-owned.
3. Less people are involved in the IS department thus the usefulness of the benefits could be seen faster.
4. The number of IS departments actually implementing TQM is higher than that of organizations.

As to the two exceptions, several reasons could explain this difference, but the most important one is IS managers’ misunderstanding of the customer concept.

Most IS managers understand that the customer is only the person to whom you can sell a product and make some benefit. Since IS managers are doing business only to the organization, they are not selling their services to any outside person and they are not gaining any money or revenue. Thus, most managers do not understand that other departments of their organizations are also their customers. To them, these are users but not customers. They consider that they do not have customers to listen to or identify.

The same hypothesis t-tests that is, “Mean of Organization = Mean of IS Function” were applied to the results given in Table 4.7 to test for any statistical difference between the organization and the IS function and results showed that no significant statistical differences did exist.

In summary, the results of both this and the preceding section show that IS managers do believe that TQM can improve the quality of information. On the one

hand, TQM is beneficial to the organization and even more to the IS function, and the benefits of its implementation are in general better experienced over time. On the other hand, all of its concepts and tools are perceived as useful and, once again, more useful for the IS department.

4.5 Possibility of implementing TQM

This last section presents the opinion of IS managers on the possibility of implementing TQM concepts within the organization as a whole, and within the IS function. This would answer the third research question: Does the IS manager believe that TQM concepts and tools could be implemented within the organization?

The issue of the possibility of implementing TQM was addressed in questions 17 and 18 of the distributed questionnaire. Only 27 cases were taken into consideration for the calculation of results, representing managers knowledgeable with TQM. The results were as presented in Table 4.8.

Table 4.8

Possibility of Implementing TQM Concepts/Tools in Organization/IS Function

	Organization (Mean)	IS Function (Mean)
Benchmarking	2.04	1.85
Concurrent Engineering	2.15	1.93
Continual Improvement	1.59	1.19
Employee Empowerment	1.85	1.59
Group Decision Making	2.07	1.56
Identifying the Customer	1.81	1.70
Listening to customers	1.70	1.70
Process Analysis	1.70	1.41
Statistical Process Control	2.00	1.59
Top Management Leadership	1.59	1.70

It is clear that in the opinion of IS managers all concepts and tools of TQM can be implemented both in the organization and in the IS department. IS managers consider that the concepts that can be most implemented in the organization in order of importance are:

<u>Organization</u>	<u>Rank</u>	<u>IS function</u>	<u>Rank</u>
Continual Improvement	1	Continual Improvement	1
Top Management Leadership	1	Process Analysis	1
Listening to the Customer	2	Group Decision Making	2
Process Analysis	2	Employee Empowerment	2
Identifying the Customer	3	Statistical Process Control	3
Employee Empowerment	4	Identifying the Customer	4
Statistical Process Control	5	Listening to the Customer	5
Benchmarking	6	Top Management Leadership	6
Group Decision Making	7	Benchmarking	7
Concurrent Engineering	8	Concurrent Engineering	8

As it was the case in the preceding two sections, in this section also it is clear that IS managers consider that the possibility of implementing TQM in their own departments is higher than in the whole organization. Results for the IS department range between 1.19 and 1.93, versus 1.59 and 2.15 for the overall organization. This fact could also be explained by the same reasons listed earlier (cf. paragraphs 4.3 and 4.4). Similarly according to results of hypothesis tests no significant differences exist between the organization and the IS function.

Another difference worth noticing is the ranking for some of the concepts and tools. Above are listed the concepts of TQM according to their ranks for the organization and the IS function. Three of these concepts have high difference in their attributed ranks: "Listening to the Customers", "Group Decision Making", and "Top Management Leadership".

As mentioned for the concept “Identifying the Customer”, the same reasons given in section 4.4 could explain the ranking difference for the concept “Listening to Customers”.

The difference in the case of the concept “Group Decision Making” could be due to two main reasons:

1. Relatively the IS department is very small in comparison with the organization. Therefore, it would be easier to implement group decisions with a lower number of employees.
2. The IS department groups people of relatively the same education and knowledge, which is not the case for the organization where the group can include the manufacturing manager and the person working on the manufacturing chain.

The concept “Top Management Leadership” is considered as easier to implement in the organization than in IS function. This could be explained by the fact that information systems is relatively a new field in Lebanon. In parallel most companies in Lebanon are family owned. Thus, its top management does know that information systems is essential for the work and success of the organization but it does not have enough experience in this field. And this fact encourages IS managers to consider that top management cannot lead them in their work. But in the case of the organization, top management has enough knowledge and highest number of years of experience and the highest rank in the company thus it could lead the work and decisions of the organization.

This opinion of IS managers considering that top management’s leadership role differs between the organization and the IS function is emphasized by the results to Question 10 of the distributed questionnaire where IS managers were asked about top management’s support towards IS function’s efforts to implement TQM. The results were as follows:

<u>Top Management Support</u>	<u>Frequency</u>	<u>Percentage</u>
Very Supportive	7	24.1
Somewhat	7	24.1
Less Than	2	6.9
Neutral	8	27.6
Resistive	0	0

Approximately half of the questioned managers (14 out of 29) considered their organization's top management as supportive to TQM implementation, whereas the other half (15 out of 29) either did not answer or considered it as less than supportive. These results could be explained by the following: Because top management does not have enough information system knowledge to lead the IS function, according to half of the IS managers it was not supportive to TQM implementation. But, in parallel, top management has enough experience in leading the overall organization and knows that information systems have become essential to the success and work of any organization then, and according to the second half of IS managers, it was supportive to the idea of implementing TQM.

In summary, IS managers believe that TQM concepts and tools could be implemented within organizations but realization of this implementation could differ depending on the concept chosen and whether it is being implemented within the organization as a whole or within the IS department.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

5.1 Summary

This study was conducted to determine if IS managers were familiar with TQM: its implementation, its concepts and tools, and the benefits it can bring to the organization and the IS function. This was accomplished by administering a questionnaire to 29 IS managers in organizations of several types where IS departments are of different sizes.

The results showed that the majority of Lebanese organizations are not implementing TQM and those who are implementing have been doing so for a maximum period of three years. Plus IS managers have started implementing TQM in their departments while their organizations have not yet started.

Concerning IS managers understanding of the philosophy of TQM, it was clear that these managers have heard of TQM. 55.1% out of 93.1% do understand the philosophy at least fairly well. Plus, they found most of the concepts presented to them as belonging to a TQM implementation.

In addition, IS managers do believe that TQM can improve the quality of information and that it has a positive impact on the IS function. On the one hand, those who are implementing TQM have achieved most of the benefits whether in the overall organization or in the IS function. But its benefits were more realized in the IS department than in the organization. Moreover, it was found that benefits are realized over the years but not many cases were available to completely prove this fact. On the other hand, according to IS managers all of TQM's concepts are useful to the organization and more useful to the IS function.

As for IS managers' belief concerning the possibility of implementing TQM concepts and tools within the organization and the IS function, results showed that all concepts could be implemented. Plus implementation is more possible in the IS function in comparison with the organization. But this depends on which tool is being implemented.

5.2 Recommendations

This research showed that IS managers are aware of TQM. But some recommendations are due. **First**, IS managers should be more involved in the plans, work, changes of their organizations. Results did show that IS managers are not much involved in the work of their organizations. This was shown by the fact that information system managers consider benefits as more realized in the IS department, tools more useful for the IS function and easier to implement in this function. Among the principles underlying TQM is employee involvement and satisfaction. And for a manager to be involved and satisfied he should be aware of his organization's plans, he should be part of its decision-making and problem-solving, and he should feel that the well-being of the company is one of his personal responsibilities.

Second, IS managers should be aware of the customer concept. Customer satisfaction is one of the main principles behind TQM. It is very essential to identify customers and listen to their demands in order to be able to satisfy them. Eventhough IS managers are doing business only to the organization, they do have customers to whom they are providing services. These customers are employees in the different departments of the organization who are using their information systems.

Third, to IS managers top management leadership is more possible to implement in the organization in comparison with the IS function since top managers do not have enough experience in this field. Another principle behind TQM is continual improvement and control which should be applied on all levels, of course in proper adjusted ways. Plus as IS managers should be involved in their organization's

work and plans, also top management should be able to actively participate in all of its department's work and plans. Therefore among top managers their should be someone who is able to actively lead the IS department's operations.

Fourth, competition is increasing in Lebanon. In order to be able to face this competition Lebanese companies should introduce TQM programs to improve the quality of their work. And as this research showed the benefits of TQM are several. But implementation is very low. Therefore our recommendation is to start TQM programs especially that according to the results out of 29 managers 27 do know TQM but only 9 are implementing it in their IS departments.

But this low rate could also be explained by absence of top management support which brings us to our **final** recommendation. Top management support is an essential factor behind TQM success. Whenever IS managers are faced with lack of support they are not encouraged to implement TQM. Therefore top management should know TQM and must support its implementation in all of the organization's departments and most especially in the IS function.

5.3 Implications for future study

This study was conducted on 29 IS managers from different service and production businesses in Lebanon. It is recommended to repeat this same study when more IS managers would have started implementing TQM. It is also recommended to conduct the same study but addressed to organization managers testing benefits realized by the organization where IS departments are implementing TQM

APPENDIX A

QUESTIONNAIRE TO THE INFORMATION SYSTEM MANAGERS AND ADMINISTRATORS

Questionnaire To The Information Systems
Managers and Administrators.

Dear Madam / Sir

I am glad to tell you that this questionnaire is designed to be used for the fulfillment of a Master of Business Administration Research. The purpose of this project is to collect realistic information from the information systems managers and administrators regarding the application of Total Quality Management concepts to improve quality of information. I assure you that your ideas and opinions will not be used for other purposes except my research topic. Your cooperation will be of great value.

Best Regards

Marie Therese Rizk
Business School - Lebanese American University (LAU)

1. What is your organization's primary industry / service?

2. How many people are employed within your Information Systems (IS) function?
----10 or less ----11-20 ----21-30 ----31-40
----41-50 ----greater than 50

3. What is your organization's approximate annual sales dollars (in millions)?
----1 or less ----2-3 ----4-5 ----6-7
----8-9 ----10 or more

4. Would you describe the IS function within your organization as :
----Centralized ----Decentralized
----Some functions centrally controlled and others not

5. Have you heard of Total Quality Management (TQM)?
----Yes ----No

6. How well do you understand the philosophy and concepts of TQM?
----Completely ----Fairly Well ----Somewhat ----A little
----Confused

7. Do you believe TQM can have a ---- impact on the IS function?
----Very significant ----Significant ----Moderate
----Very little ----No

8. Is your organization currently implementing TQM?
----Yes ----No

9. Is the IS function currently implementing TQM?
----Yes ----No

10. Top management has been ----- in our efforts to implement TQM concepts within the IS function.
- Very supportive -----Somewhat -----Less than
 -----Neutral -----Resistive

11. Approximately how long have you been actively implementing TQM (no of years)?

Organization:

- Not at all -----less than 1 yr. -----1-3 yrs
 -----3-5 yrs -----greater than 5 yrs

Department:

- Not at all -----less than 1 yr. -----1-3 yrs.
 -----3-5 yrs. -----greater than 5 yrs

For the remaining questions, please circle the appropriate answer using the indicated scales:

12. It has been found that TQM can provide several benefits to an organization and/or a department. Please indicate which of the following benefits have been realized by your organization:

	Definitely Realized			Probably have not realized	Definitely have not realized
	realized	somewhat	Neutral	realized	realized
Improved customer satisfaction	1	2	3	4	5
Enhanced quality of products delivered	1	2	3	4	5
Enhanced quality of services provided	1	2	3	4	5
Lower maintenance in developed applications	1	2	3	4	5
Greater productivity of IS personnel	1	2	3	4	5
Reduced product development time	1	2	3	4	5
Increased flexibility in meeting customer demands	1	2	3	4	5
Better utilization of human resources	1	2	3	4	5
Better management control of IS function	1	2	3	4	5

13. Please indicate which of the following benefits have been realized by your **IS function**.

	Definitely Realized			Probably	Definitely
	realized	somewhat	Neutral	have not realized	have not realized
Improved customer satisfaction	1	2	3	4	5
Enhanced quality of products delivered	1	2	3	4	5
Enhanced quality of services provided	1	2	3	4	5
Lower maintenance in developed applications	1	2	3	4	5
Greater productivity of IS personnel	1	2	3	4	5
Reduced product development time	1	2	3	4	5
Increased flexibility in meeting customer demands	1	2	3	4	5
Better utilization of human resources	1	2	3	4	5
Better management control of IS function	1	2	3	4	5

14. To what degree do you believe the following concepts belong in a TQM implementation?

	Definitely	Might	Neutral	Probably	Definitely
	Belongs	Belong		doesn't belong	doesn't belong
Benchmarking	1	2	3	4	5
Concurrent engineering	1	2	3	4	5
Continual improvement	1	2	3	4	5
Employee empowerment	1	2	3	4	5
Group decision making	1	2	3	4	5
Identifying the customer	1	2	3	4	5
Listening to customers	1	2	3	4	5
Process analysis	1	2	3	4	5
Statistical process control	1	2	3	4	5
Top management leadership	1	2	3	4	5

15. To what degree do you believe the following concepts would be useful in your organization.

	Definitely Belongs	Might Belong	Neutral	Probably doesn't belong	Definitely doesn't belong
Benchmarking	1	2	3	4	5
Concurrent engineering	1	2	3	4	5
Continual improvement	1	2	3	4	5
Employee empowerment	1	2	3	4	5
Group decision making	1	2	3	4	5
Identifying the customer	1	2	3	4	5
Listening to customers	1	2	3	4	5
Process analysis	1	2	3	4	5
Statistical process control	1	2	3	4	5
Top management leadership	1	2	3	4	5

16. To what degree do you believe the following concepts would be useful in your IS department.

	Definitely Belongs	Might Belong	Neutral	Probably doesn't belong	Definitely doesn't belong
Benchmarking	1	2	3	4	5
Concurrent engineering	1	2	3	4	5
Continual improvement	1	2	3	4	5
Employee empowerment	1	2	3	4	5
Group decision making	1	2	3	4	5
Identifying the customer	1	2	3	4	5
Listening to customers	1	2	3	4	5
Process analysis	1	2	3	4	5
Statistical process control	1	2	3	4	5
Top management leadership	1	2	3	4	5

17. To what degree do you believe these concepts could be implemented **within your organization?**

	Definitely Belongs	Might Belong	Neutral	Probably doesn't belong	Definitely doesn't belong
Benchmarking	1	2	3	4	5
Concurrent engineering	1	2	3	4	5
Continual improvement	1	2	3	4	5
Employee empowerment	1	2	3	4	5
Group decision making	1	2	3	4	5
Identifying the customer	1	2	3	4	5
Listening to customers	1	2	3	4	5
Process analysis	1	2	3	4	5
Statistical process control	1	2	3	4	5
Top management leadership	1	2	3	4	5

18. To what degree do you believe these concepts could be implemented into the **IS department?**

	Definitely Belongs	Might Belong	Neutral	Probably doesn't belong	Definitely doesn't belong
Benchmarking	1	2	3	4	5
Concurrent engineering	1	2	3	4	5
Continual improvement	1	2	3	4	5
Employee empowerment	1	2	3	4	5
Group decision making	1	2	3	4	5
Identifying the customer	1	2	3	4	5
Listening to customers	1	2	3	4	5
Process analysis	1	2	3	4	5
Statistical process control	1	2	3	4	5
Top management leadership	1	2	3	4	5

19. Please provide any additional comments you would like to add about your organization's/department's efforts to implement TQM.

Thank You For Your Cooperation

BIBLIOGRAPHY

- 1- ARTHUR, Lowell Jay. Improving Software Quality An Insider's Guide to TQM, John Wiley & Sons, Inc. New York, 1993.
- 2- ASHMORE, G. Michael, "Better Information Means Better Quality.", The Journal Of Business Strategy, January/February 1992, pp. 57-60
- 3- BRAITHWAITE, Timothy. Information Service Excellence through TQM, ASQC Quality Press, Milwaukee, Wisconsin, 1994.
- 4- FLOOD, Robert L. Beyond TQM, John Wiley & Sons Chichester, England, 1993.
- 5- JABLONSKI, Joseph R. Implementing TQM: Competing in the Nineties through Total Quality Management, Technical Management Consortium, Albuquerque, New Mexico USA, 1994.
- 6- JURAN, Joseph M. "Made in USA: A Renaissance in Quality", Harvard Business Review, July-August 1993, pp. 42-50.

- 7- MCLEOD, Raymond Jr. Management Information Systems: A Study of Computer-Based Information Systems, Prentice Hall International, Inc., Englewoods Cliffs, New Jersey, 1995.
- 8- PEARSON, Michael J. and McCahon, Cynthia S. and Hightower, Ross T. "Total Quality Management: Are information systems managers ready?" Information & Management, Vol. 29, 1995, pp. 251-263.

- 9- Peratec Executive Briefing, Total Quality Management: The key to business improvement, Chapman & Hall, London, UK, 1994.
- 10-PHIPPS, Polly A. "Western Management Versus TQM.", Monthly Labor Review, December 1995, v118, n12, p. 50.
- 11-PITMAN Ben, "Total Quality Management For Information Services." Journal of Systems Management, July 1992, p.18.
- 12-RYAN, James T. "Is total quality fading as a strategy?", HR Focus, October 1995, vol. 72, n. 10, pp. 14-15.
- 13-SCHMMIDT, Warren H. and Finnigan, Jerome P. TQManager Jossey-Bass Publishers, San Francisco, 1993.
- 14-SHREDNICK, Harvey R. and Shutt, Richard J. and Weiss, Madeleine. "Empowerment: Key to IS world-Class Quality.", MIS Quarterly, December 1992, pp. 491-505.
- 15-"The Straining Of Quality", Economist, January 14, 1995, Vol. 334, Issue 7897, p. 55.
-