
Factors affecting the implementation and success of TQM

Implementation
and success
of TQM

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Introduction

It is common sense that TQM should be tailored to an organization's needs. Even so, little research has been conducted identifying which organizational factors should be considered when planning a TQM approach. The research findings shown within this article aim to address this shortcoming by identifying the factors which most commonly affect the implementation of TQM. The article then concludes by summarizing how each factor can affect the "level of implementation difficulty".

Among the many quality practitioners who have stated that TQM needs to be tailored to the organization are Atkinson[1] and Kees Van Ham[quoted in 2], Secretary General of the European Foundation for Quality Management. Atkinson stated that "organisations employ differing technology, have different histories and backgrounds, serve different markets with different products and employ people from different cultures, so the drive to improve quality has to be managed differently". Kees Van Ham stated with regard to implementing TQM, "Organisations differ in terms of history, markets, style of leadership and cultural environment. This implies that every organisation has to develop, its own, unique way".

The characteristics of an organization can even affect the implementation of TQM at different sites within a company. This was emphasized by Van Der Akker[3], who described how TQM needed to be implemented differently within Aery Materials Group Europe because of the culture differences between the company's eight manufacturing plants and 15 sales offices.

An organization's level of quality development is one characteristic which is often cited as a factor to consider when selecting which method of implementation to use. The number of quality awards (European Quality Company Award; America's Malcolm Baldrige Award; Japan's Deming Award), the different benchmarking quality databases and consultancy "health checks" are all indicators of the need for organizations to monitor this particular characteristic.

As quality development is already well known as an important factor to consider (and is a subject in itself) it will not be discussed in detail here. The research shown within this article primarily concentrates on reporting the other, "less obvious", factors which are important to consider when implementing TQM.

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Research by Dale and Lascelles[4] has indicated the difficulty of such research. They investigated whether companies use techniques in any order or whether there is an ideal order in which to apply techniques. Through their studies they concluded that “because of the variety of starting points and motivations for quality improvement it is not possible to identify an implementation plan detailing the order in which techniques should be used”. While this is understood, it is believed that it is important to identify the most common factors which affect the implementation of TQM. The identification of such factors will encourage their consideration when companies are developing an appropriate implementation plan.

Research method

In investigating which characteristics of an organization affect the implementation of TQM the following terms were used: “quality activity” and “quality critical organizational characteristic”.

The term quality activity was used to describe a distinguishable tool or method used for quality improvement. This includes everything from control charts to ISO 9000 and TQM. TQM is considered to be a quality activity, which is itself composed of many quality activities.

The term quality critical organizational characteristic (QCOC) was used to describe a characteristic that influences the effectiveness of a quality activity. For example, the level of education of employees, the organization’s management style, and the organization’s prime manufacturing activity may all influence how beneficial it is to implement a quality activity.

From initial research involving over 200 companies participating in a “Management of Quality” questionnaire programme (see[5]), it was identified that there were variations in the use of quality activities dependent on the characteristics of organizations. For instance, the findings indicated that companies with a large number of employees are more likely to have implemented TQM (see Table I).

Findings such as this either show that: certain types of organization react more quickly to new ideas and methods such as the implementation of TQM; or TQM is more effective in certain types of organizations.

Further analysis of the questionnaire responses revealed that companies with different organizational characteristics rank the beneficial effects of quality

Number of employees in category	Number of companies	Percentage use of TQM
1-30	28	4
31-100	46	11
101-300	40	15
301+	27	27

Table I.
The relationship between number of employees and the implementation of TQM

activities differently. Unfortunately though, because of the complex interrelationships between different organizational characteristics, it was too difficult to prove conclusively that particular quality activities were more effective in certain organizations. Owing to this difficulty it was decided that a structured interview approach would be used for the research.

Structured interviews were undertaken at 21 leading TQM organizations between November 1990 to February 1991. Interviews involved the “steerers” and “planners” of TQM (therefore primarily directors or managing directors). The interviews were approximately three hours long and investigated the factors affecting the success of TQM and other quality activities. Further details on the companies visited and the research method used can be obtained from Mann’s PhD thesis[5].

The prime method used to investigate for QCOCs was to ask the interviewee which characteristics of his/her organization influenced the implementation or effectiveness of a quality activity. This was followed by further questioning to obtain details on the difficulties experienced during implementation. After completion of the interviews, similar factors affecting quality activity implementation were grouped together, enabling the identification of the most common QCOCs.

In investigating for QCOCs, a number of important factors were identified:

- *All QCOCs change with time.* For example, with time, the leadership style may change from authoritative to participative, the average employee age may increase, the method of manufacture may change from batch to mass production and so on. These changes are likely to affect which QCOCs are quality critical at one particular time.
- *QCOCs vary for each quality activity.* For example, factors such as an organization’s method of manufacture, technological sophistication and level of product contact were identified as affecting the implementation of statistical process control (SPC) but not the implementation of delegated teams (management-led teams). Conversely, organizational stability was more frequently mentioned as affecting delegated teams than SPC.
- *QCOCs vary depending on the stage of quality activity development.* For example, trade unions were cited as a QCOC primarily in the initial stages of TQM implementation. Once TQM is implemented, they usually cease to be a QCOC or a major factor in its success.

As a general guideline, one can distinguish between QCOCs affecting the “implementation” and “operational” stages of a quality activity. In the context of the research the definition used for quality activity implementation was “the period of time between the planning of a quality activity to when the quality activity becomes operational. Operational describes the period from when the quality activity becomes embedded within the organization and is self-sustaining”.

As QCOCs were found to vary based on the quality activity and stage of quality activity development, the investigation concentrated, as it proceeded, on identifying the QCOCs affecting the implementation stage of TQM. An in-depth investigation of all the different quality activities (65 were identified by Mann and Kehoe[6]) was not feasible within the constraints of the research programme.

QCOCs affecting the implementation stage of TOM

Table II shows the 24 secondary QCOCs which were identified as affecting the implementation of TQM. These were then categorized into seven primary QCOCs for clarity. Initial analysis indicated that these seven primary QCOCs also influenced the operational stage of TQM, although the “level of effect” differed. A detailed analysis of the QCOCs affecting the operational stage of TQM was not undertaken as: most structured interview questions referred to the implementation stage of TQM; only approximately half of the companies

Primary QCOCs	Secondary QCOCs
1. Process factors	Method of manufacture
2. Type of employees	Skill level Level of education Length of employment Age distribution of employees Employees' level of product contact
3. Shared values	Employees' attitude to change Business performance Organization's age Methods used Understanding of quality improvement need Salary Working conditions
4. Management style	Management board's attitude towards change Middle management's attitude towards change Junior management's attitude towards change Leadership style Management planning Departmental interaction
5. Organizational structure	Organizational structure description (number of sites) Stability of organizational structure Geographically integrated
6. Number of employees	Number of employees
7. Industrial relations	Industrial relations

Note: QCOC = quality critical organizational characteristic

Table II.
The QCOCs affecting the implementation stage of TQM

had entered the operational stage of TQM and of these most had only recently completed the implementation.

Figure 1 shows the percentage of interviewed companies which reported each factor as a QCOC. The most commonly reported secondary factors were the management board's attitude to change, and trade union support.

Figure 2 summarizes the information in Figure 1 by showing the percentage of companies which indicated that at least one secondary QCOC from the primary QCOC categories affected the implementation of TQM. Figure 2 shows that the management style and shared values of the organization were the most commonly reported primary factors.

Unfortunately, owing to the nature of the investigation, it was not possible to quantify the level of *criticality* of each QCOC. It is believed though (after consideration of the structured interview responses to other questions), organizational stability and management commitment were the most critical to TQM success.

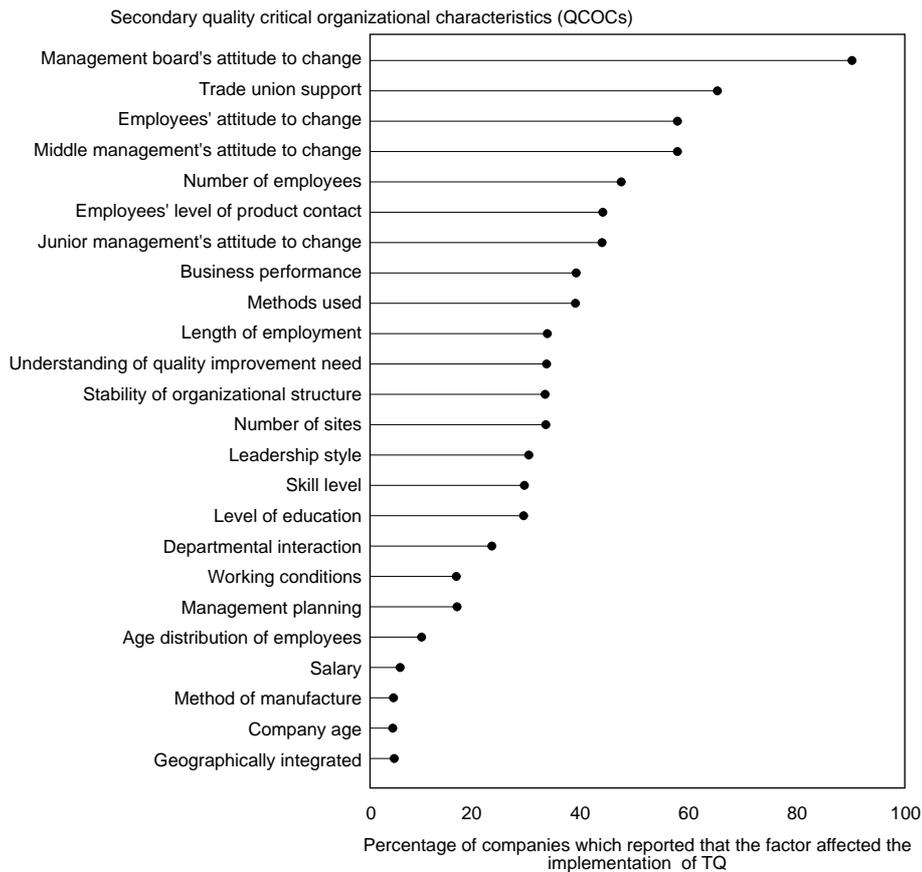


Figure 1.
Secondary QCOCs
affecting the
implementation
stage of TQM

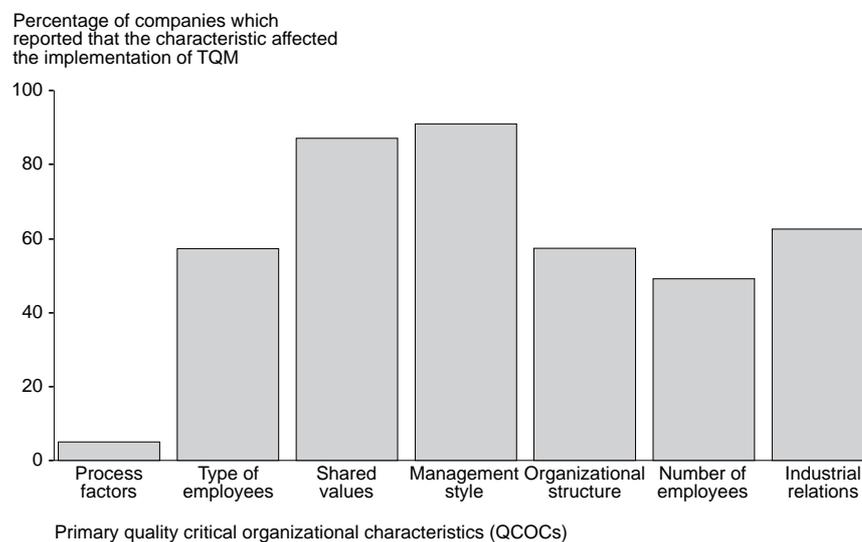


Figure 2. Primary QCOCs affecting the implementation of TQM

These two threats were described clearly by one interviewee, “TQM was initiated through a new managing director but it declined owing to the backers/supporters leaving. TQM hadn’t had time to settle and become ingrained into the company”. He then went on to explain that, “the driving force for the teams was taken away with the merger and the subsequent reorganization, although there was some success. They basically though had little chance to succeed”.

Difficulty in implementing TQM

An analysis of the experiences of the 21 companies interviewed enabled a guideline to be developed showing how each QCOC most commonly affects the implementation of TQM. This guideline, (see Table III), shows the “level of difficulty” an organization can expect when implementing TQM. For each QCOC and for three measures of quality development the extreme conditions which are likely to cause a low and high implementation difficulty are given.

It is recommended that organizations evaluate their “level of difficulty” with regard to these factors. By identifying their most critical factors, methods can then be developed to minimize the difficulty. For instance, companies which experienced a high implementation difficulty recommended that the management board play a more prominent role in the implementation. This may take the form of the management board being involved not only in the steering of TQM but also in its management on a daily basis. This may require its involvement in lower-level teams, education and training and recognition activities.

The remainder of this section will describe in greater detail how each QCOC affected the implementation of TQM.

Low<Expected difficulty of implementing TQM>High			Implementation and success of TQM
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1. Process factors			
Method of manufacture	Flexible, low level of job specialization	Not flexible, high level of job specialization	
2. Type of employees			
Skill level	High	Low	
Level of education	High	Low	
Length of employment	Short	Long	
Age distribution of employee	Young (18-30 years old)	Old (50-65 years old)	
Employees' level of product contact	High	Low	
3. Shared values			
Employees' attitude towards change	Positive	Negative	
Business performance	Excellent	Poor	
Organization's age	New organization	Established organization	
Methods used	New technology	Traditional	
Understanding of quality improvement need	High	Low	
Salary	High	Low	
Working conditions	Excellent	Poor	
4. Management style			
Management board's attitude towards change	Positive	Negative	
Middle management's attitude towards change	Positive	Negative	
Junior management's attitude towards change	Positive	Negative	
Leadership style	Participative	Authoritative	
Management planning	Long term	Short term	
Departmental interaction	Excellent (no barriers)	Poor (barriers)	
5. Organizational structure			
Organizational structure type	One site	High number of sites	
Stability of organizational structure	Stable	Unstable	
Geographically integrated	Integrated	Fragmented	
6. Number of employees			
	Small	Large	
7. Industrial relations			
	Excellent	Poor	
8. Quality development			
Level of quality development	High	Low	
Quality activities	Many	None	
Integration of quality activities	Integrated	Fragmented	

Table III.
The expected difficulty
of implementing TQM
with regards to
QCOCs and quality
development

Process factors

Method of manufacture. An organization's method of manufacture can hinder the application of quality activities. Traditional production methods and manufacturing layouts may encourage job specialization and menial repetitive work. In these circumstances it may be difficult for employees to become actively involved in the improvement of work processes. However, it is important that they are involved in the TQM effort, to prevent any feelings of alienation. Many organizations are surprised how employees, given the correct support (particularly resources) and encouragement, can make an active contribution to the organization and their working environment.

Type of employees

The diversity of employees can present problems when implementing TQM. It is therefore recommended that representatives of each "type of employee" are involved in the development of the TQM implementation plan. This will ensure that training and TQM activities take into account their particular needs.

If the needs of employees, as listed below, are considered, TQM can be effectively implemented:

- *Skill level.* Highly skilled employees are likely to accept TQM more quickly than lower skilled employees. They are less likely to feel threatened by proposed changes and are more likely to understand its need. Organizations wishing to increase the autonomy of their workforce may need to improve the skill level of their employees.
- *Level of education.* Employees with a high level of education are likely to accept TQM more quickly. A number of interviewees believed that individuals with a high level of education are more likely to judge TQM by its results rather than through its publicity. Whatever the level of education, it is important to note that publicity and posters may be viewed cynically and can create high expectations which are difficult to meet.
- *Length of employment.* Employees who have worked in an organization for a long time can be the hardest to convert to TQM. They are likely to have witnessed many new management approaches and initiatives. If these approaches were not as successful as expected, then these employees are likely to be sceptical towards the implementation of TQM. The most effective method of converting these employees to TQM is through their involvement in quality activities which produce improvements.

With regard to job ownership, employees who have worked in a certain position for a number of years often do not want any increased responsibility. New responsibilities for some employees may cause distress. It is therefore important to consider each individual's needs before implementing changes which affect them.
- *Age distribution of employees.* An "old" workforce may not accept change as quickly as a "young" workforce. An old workforce may feel threatened at having to learn new responsibilities and use new work

methods. It is therefore important to have a comprehensive education and training programme tailored to their needs. A gradual approach to TQM which gains their confidence, may be appropriate.

- *Employees' level of product contact.* Employees in close contact with the product are more likely to accept TQM. This is because quality activities are typically associated with products rather than people or non-product processes. For this reason it is important in the planning of TQM to discuss how TQM will be implemented in low product contact areas (such as staff areas). A solution would be to develop specific training programmes for these areas providing practical applications of relevant quality activities. Quality activities concentrating on improving the service (product) between internal suppliers and customers may be appropriate.

Shared values

- *Employee's attitude towards change.* A positive attitude by employees towards change assists in the implementation of TQM. A negative attitude can be changed through education and training and the involvement of employees in quality activities which result in improvements. After the implementation of an education and training programme, it is important that involvement shortly follows, otherwise employees may become disillusioned.

The setting up of a communication structure between management and employees can help to alleviate problem situations. The organization should aim to install a culture whereby employees recognize problems and solve them automatically (as part of their responsibility).

- *Business performance.* The relationship between business performance and TQM acceptance is complex. Organizations with an excellent business performance may accept the need to change as a necessary prerequisite for success, or alternatively, employees may react against TQM as they fail to understand the need to change a successful system. Similarly, organizations in a "survival situation" may act positively to change as "it's their last chance", or negatively owing to previous poor experiences. The attitude of the employees, due to the organization's business performance, should be considered when deciding the rate of implementation.
- *Organization's age.* TQM is likely to be more quickly accepted in a "new organization" or a "young organization" rather than in an established one. A new or young organization can introduce TQM as a natural element of its organization. An established organization may need to change its QCOCs, such as its shared values and management's style, which have developed over many years.
- *Work methods.* Employees used to traditional working methods such as "production make it and quality inspect it in" are likely to find it difficult

to accept the TQM concepts. These employees have probably been educated and trained in the values of job specialization, delegation, inspection and control, and are likely to react adversely to the same management advocating new values and methods.

In contrast, employees using new technology are more likely to have experienced changing working methods. The experience of new working methods should encourage a more open attitude to concepts such as TQM.

- *Understanding of quality improvement needs.* Employees who understand the need for quality improvement are more likely to accept TQM. For this reason, acceptance is likely to be high for organizations with a high level of quality development which have witnessed the benefits of quality activities.
- *Salary.* Employees with poor salaries are less likely to be enthusiastic for TQM. These employees are likely to feel undervalued by top management and will be suspicious of any new approaches. Organizations using a performance appraisal system will probably need to change the appraisal system to support the aims of TQM.
- *Working conditions.* Employees working in poor working conditions are less likely to be enthusiastic for TQM. Similar to employees with low salaries, these employees are likely to feel undervalued by top management and will be suspicious of any new approaches.

Management style

- *Top management's attitude towards change.* It is essential that, prior to TQM implementation, all members of the board support the proposed approach. If the managing director or board do not demonstrate their total commitment and total involvement in TQM then it is at risk. The top managers/directors need to be "champions of quality".
- *Middle management's attitude towards change.* Middle management can be difficult to convert to TQM. Many managers may have been with the organization for a number of years and are used to a certain style of management. It may be difficult for them to give greater responsibilities to employees and change to a more participative style of management. In addition, they themselves may be controlled more by the incoming TQM structure.

To gain the middle management's commitment and confidence in TQM, an education and training programme must address their needs and a support structure needs to be developed to assist them through the change period. Without the total commitment of middle management, team building and employee involvement will be affected.

- *Junior managements' attitude towards change.* Junior managers can have the same problems as middle managers in accepting change. Those used

to fire-fighting and delegating to employees may have difficulty in changing to a more participative style of management. As they are often the direct link between employees and management, it is important that they fully understand TQM. As the management style of junior managers is typically not as developed as middle managers, they are likely to accept TQM more quickly.

- *Leadership style.* TQM aims to encourage a participative style of management throughout the organization. An organization with this style of management is likely to be more enthusiastic towards TQM and will have less need to change its systems and communication structure. Organizations with an authoritative style of management, whereby employees/managers are promoted who are aggressive, career minded and not team workers, are likely to find it more difficult.

To achieve a participative management style, it may, at first, be necessary to use an authoritative leadership style to implement TQM. This may consist of delegating and monitoring the performance of quality activities. Through the implementation of quality activities, such as teams, and top management leading by example, a more participative style of management can develop.

- *Management planning.* Organizations driven by short-term planning may find it difficult to change to TQM where the emphasis is on long-term planning. Rewards, such as promotion for quick results involving fire-fighting, need to be redirected to rewards for prevention and participation activities. Long-term planning can begin by implementing a comprehensive education and training programme.
- *Departmental interaction.* Organizations which are function oriented and/or encourage specialization may have difficulty in converting to TQM. Barriers to departmental interaction, such as departmental rivalry, need to be removed in order for TQM to operate successfully. Teams or new systems which concentrate on improving cross-functional integration can help to achieve this.

Organizational structure

- *Organizational structure description (number of sites).* TQM is generally easier to implement within one site than in a number of sites. The larger the number of sites, the greater the difficulty of controlling its implementation and developing an integrated approach to TQM (if required). The greater the number of sites, the more likely they will differ with regard to QCOCs and quality development.

It is important that organizations develop a TQM approach which complements their organizational structure. For instance, an organization consisting of a number of sites needs to decide whether to implement a fragmented approach (allowing each site to develop its own

approach independently) or an integrated approach. Both approaches have advantages and disadvantages.

A fragmented approach encourages sites to pursue and tailor TQM to their own needs. With such an approach, TQM is likely to progress at different rates on each site and the corporate/divisional boards' control is likely to diminish.

An integrated approach, in contrast, provides a greater structure and control over each site for the corporate/divisional board. The advantage of this approach is that an imposed structure reduces the likelihood of poor implementations occurring by ensuring there is a similar level of management commitment at each site. The main difficulty of this approach is to develop a cohesive strategy which considers the specific needs of each site while maintaining a similar rate of progress across all sites.

- *Stability of organizational structure.* If the organizational structure is stable then TQM will be easier to implement. An unstable organizational structure can threaten the implementation of TQM. For example, the merging of two sites could adversely affect the structural elements of TQM already in place, like delegated teams. Also, the departure of committed TQM personnel, particularly members of the site board, can threaten the impetus and drive for TQM.
- *Geographically integrated.* Organizations implementing TQM into sites geographically distanced from each other may find it more difficult to implement an integrated TQM approach. The physical distance between sites may hinder the transfer of information and weaken the effect the corporate board's leadership style and approach has on each site. In addition, sites geographically distanced are likely to have different QCOCs owing to the effect of the local environment on the organization's employees.

Number of employees

Generally, the smaller the number of employees, the easier it is to implement TQM. At smaller sites, the steerers of TQM (usually the management board) are more visible and have less employees to manage and involve in TQM. This may mean a less detailed and sophisticated implementation structure is required to ensure employee participation and to improve business performance.

Industrial relations

Organizations with poor industrial relations are likely to find it more difficult to implement TQM. Trade unions will be suspicious of TQM and the changes that may occur. This suspicion can be overcome by involving trade unions from the start either in the appraisal or planning of TQM. The involvement of trade unions will help in the acceptance of TQM by all employees.

Quality development

Organizations with a high level of quality development are likely to be enthusiastic towards TQM. These organizations will understand the need for

quality improvement and are therefore less likely to require as much training and education. They will be able to implement TQM more quickly.

It is important that quality activities presently being used are integrated within the TQM approach. This will ensure they do not become isolated with regard to the allocation of resources, and that they can still operate successfully.

Conclusions

In recent years, organizations have begun to realize that TQM is the way forward to achieve long-term business success. Many organizations have found it difficult to implement an effective TQM policy. One of the prime reasons for this is that organizations fail to identify what they are attempting to change and achieve by implementing TQM. If these factors are not addressed then the necessary resources and commitment required to develop an effective tailored approach may be lacking.

This article has addressed this shortcoming. The most common factors (QCOCs) affecting the successful implementation of TQM have been identified. Based on these findings it is recommended that organizations should undertake a thorough analysis of their QCOCs before implementing TQM. The information from such an analysis should assist in determining which implementation approach to use and how quickly it should be implemented. Examples of the different approaches to TQM are provided in a previous article[6].

The findings have shown that there is a complex relationship between organizational factors and quality activities. Organizations must constantly be aware that these factors (QCOCs), which are critical to a quality activities success, may: change with time; vary for each quality activity; vary depending on the stage of quality activity development.

Organization's must therefore be ready to change their approach to the changing circumstances.

It is hoped that, in the future, research will concentrate on exploring these relationships in greater detail and: identify the most common "quality critical" organizational factors for many different quality activities; evaluate the level of criticality of each of these factors; investigate the relationships between changes in criticality with changes in an organization's level of quality development.

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