A contingency approach to Quality System Implementation

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Abstract

This paper describes a framework for the implementation of quality systems. It is argued that there is no one best way to implement quality systems valid for all situations. Following Galbraith, a contingency approach is presented that enables the reader to select the optimal implementation strategy for a particular situation. The approach is based on well-established organization theory and validated by the experiences of senior quality consultants.

Keywords: contingency model, implementation, project management, quality, uncertainty.

I. Introduction

Quality has been receiving a great deal of attention in the last few years. Our experience has for an important part been in the information system engineering industry. In this industry there have been, and unfortunately still are, many project failures, marked by cost overrunning, late deliveries, poor reliability and user dissatisfaction. Quality management aims to prevent these problems and tries to ensure that products, processes, or services will satisfy stated or implied needs. To achieve this goal an organization must introduce quality management and implement a quality system, which consists of the organizational structure, responsibilities, procedures, activities, capabilities and resources which are used to ensure that quality requirements are met.

During the late 1800s and the early 1900s organization theorists like Taylor (Scientific Management [1]), Fayol (Administrative Theory [2]) and Weber (Bureaucratic Organization Theories [3]) were all defining ‘one best way’ for organization structure. By then the environment

was stable and the organizations were relatively simple. The 20th century, however, has been a period of diversity and change. Organizationally this rapid change has manifested itself in more diverse, interwoven markets, the use of advanced technologies, the widespread use of specialists and larger and more complex organization structures. By then the universality of the classic homogeneous organization theory was questioned. This resulted in the 1960s in a situational organization theory, i.e. one in which the appropriateness of the organization and the management system was *contingent* upon situational factors. The awareness emerged that there was no *one* optimal management system.

The contingency theory of Galbraith [4] is such a situational organization theory, developed for the designing and structuring of organizations. It is based on large-scale empirical research. This theory states that the organization structure is conditional on the specific situation. Its basic principle is:

- there is no *one* best way for designing organizations
- any single way of organization design is not equally effective in all circumstances

Until now, the implementation of most quality systems has been uniform in different situations (organizations). One can compare these uniform implementation methods as classic ‘one best way’ organizational theories. However, since there is an enormous diversity in organizations and their quality systems there is a need for a contingency theory on the implementation of quality systems as well. The implementation of a quality system is not the same for all organizations. Therefore the contingency theory of Galbraith can be applied for quality system implementation as well. In line with this theory one can define two basic principles for quality system implementation:

- there is no single best way for implementing a quality system within different organizations
- there is no single right quality system which can be applied in all organizations

Thus, the best way to implement a quality system is dependent on the contingencies of the organization in which the implementation has to take place.

II. Implementation Framework

The implementation of a quality system requires a severe effort of the organization. To control this effort a structured approach is required. Such a structured approach is described in this paper by a framework consisting of five phases, as displayed in Figure 1.

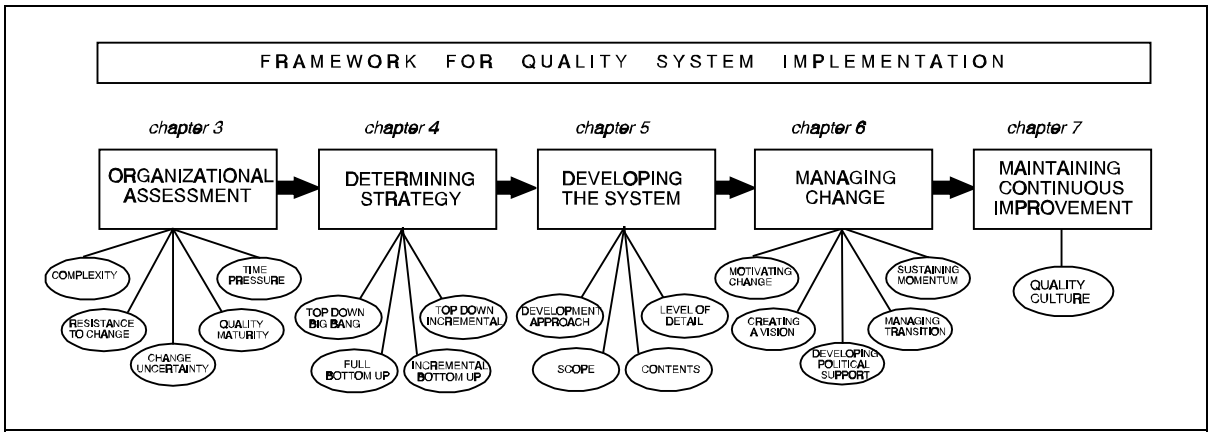

Figure 1: Framework for the implementation of a quality system

The *organizational assessment* phase consists of an organizational diagnosis to examine the situational factors and to determine contingency factors for quality system implementation. The result of this phase will determine the implementation strategy and the way in which the quality systems is to be developed. The phase *determining strategy* decides whether a top down, bottom up, or incremental implementation will be used. After the strategy is determined the *development of the quality system* can start. The procedures have to be described, and the quality manual has to be written. How detailed these documents have to be depends on the situational factors in the organizational assessment phase. *Managing change* contains five activities, i.e. motivating change, creating a vision, developing political support, managing the transition and sustaining momentum. *Maintaining continuous improvement* is realized by the creation of a total quality culture.

III. Organizational Assessment

The organization-specific contingency factors will be analyzed on the basis of the 7S-model of McKinsey, which was published by Peters and Waterman [5]. They developed a model for an organization-wide analysis. These seven S-es cover all important aspects of an organization. Peters and Waterman used this model to describe excellent organizations. In their search for excellence they found that not only the 'hard' things mattered, such as structure and strategy (and systems), but also the 'soft', people-related things, such as staff, style, skills and shared values. Success has much more to do with the way things work (or don't work) around the organization, than with formal structures and strategies.

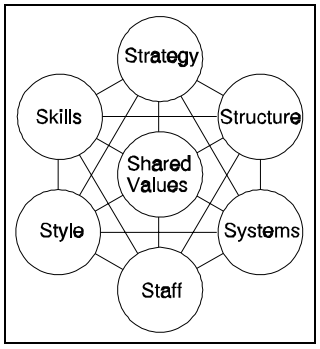

Figure 2: 7S-model

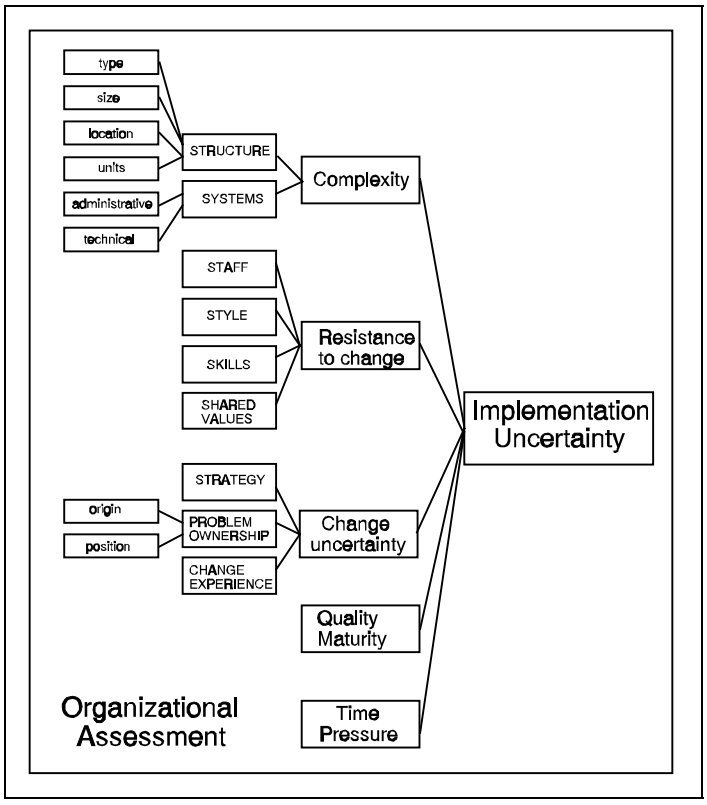

Figure 3: Organizational assessment model

This is also true for the implementation of a quality system. It is not the formal quality system itself that determines the success of the implementation, but rather the people who have to work with it; quality is determined by people.

The 7S-model has been chosen as a basis for the analysis of the contingency factors, because of these people-related factors. The 7 S-es have been supplemented with two change-related factors, i.e. problem ownership and change experience, furthermore quality maturity and time pressure have been added. These nine contingency factors are presented in the second column of Figure 3. Together they determine the level of implementation uncertainty which in our view is one of the main determinants of the implementation strategy.

As shown in Figure 3, some of the contingency factors can be broken down into subfactors and combined into higher level factors. These factors together determine the implementation uncertainty of the situation under consideration.

We now consider the relationships between the variables in a little more detail. A complete description of these relationships is presented in [6].

Complexity

The complexity of the situation in the organization is determined by the structure and the systems of the organization. The classification of the organization structure, or type, is determined by the theory of Mintzberg [7].

Structure

- Complexity is increased if the organization can be classified as a professional bureaucracy, divisionalized form or an adhocracy
- Complexity is increased if the quality system has many users
- Complexity is increased if the quality system has to be implemented in different organizational units, and different locations

Systems

- Complexity is increased if very flexible and low formalized administrative systems are used by the organization
- Complexity is increased if the organization does not use sophisticated, formalized tools and methodologies, such as CASE-tools, to engineer information systems

Implementation uncertainty is increased if complexity increases.

Resistance to change

Resistance to change, or the opposite, readiness to change, is determined by four factors: staff, style of management, skills of the employees, and shared values (culture).

Staff

- Resistance to change is increased if the staff is not willing to change, and does not have the right attitude and quality awareness for the implementation of a quality system

Style

- Resistance to change is increased if the style of management does not stimulate commitment and involvement and if the management does not exhibit a positive attitude to change

Skills

- Resistance to change is increased if the workers lack the skill to change, or are not well informed about the consequences of the introduction of the quality system

Shared values

- Resistance to change is increased if the organization has a closed, mechanistic, autocratic culture, along with a lack of spirit of team work

Implementation uncertainty is increased if resistance to change increases.

Change uncertainty

Three change-related factors seem to be important for the implementation uncertainty; strategy (internal, or external need for quality management), problem ownership and change experience.

Strategy

- Change uncertainty is increased if the introduction of quality management is externally generated, and primarily carried out to get a quality certificate (as sometimes happens with the ISO 9000 set of quality standards [8], [9])

Problem ownership

- Change uncertainty is increased if the implementation of a quality system is delegated, without a positive atmosphere to pass on the ownership
- Change uncertainty is increased if the problem owner does not have the required level of managerial skills and power to manage the change process and the involvement and commitment of senior management is lacking.

Change experience

- Change uncertainty is increased if experience with successful change is lacking, or if prior attempts to change have failed

Implementation uncertainty is increased if change uncertainty increases.

Quality maturity

The quality maturity can be measured by the level of control over the business processes of the company. There can be several stages from initial to optimal, where the level of repeatability is important. Basic questions are: are plans realized; are requirements fulfilled; are promised delivery times achieved; are quality assurance activities planned; does the company work according to standard procedures?; etcetera. Quality maturity does influence the implementation uncertainty. Humphrey gave an excellent description of a maturity concept for systems engineering [10].

- Implementation uncertainty is increased if the maturity level of the organization is low.

Time pressure

March and Simon [14] clearly showed that time pressure is another factor which influences the implementation uncertainty.

- Implementation uncertainty is increased if time pressure plays a role in the implementation of the quality system.

IV. Determining Strategy

When implementing a quality system an organization can use two basic implementation strategies, i.e. a top-down, or a bottom-up implementation strategy. These two strategies can be implemented as a big bang, or incremental, as displayed in Figure 4.

In a *top down big bang strategy* the documentation for the quality system is prepared first by a limited number of employees and then rolled out within the organization. In a *top down incremental strategy* the quality system is developed in the same way, but implemented bit by bit. A *full bottom-up strategy* is one where the users are strongly involved in the development and implementation of the quality system. An *incremental bottom up implementation* is one where the quality system is developed bottom up, but only introduced to a part of the organization, and then slowly extended to other parts. An incremental implementation may be used for one function / department, for one service group, or one project.

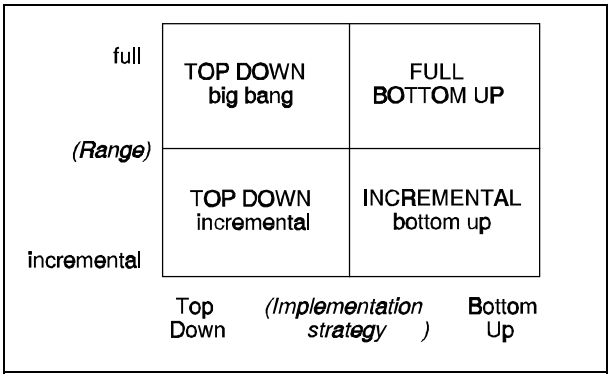

Figure 4: Four implementation strategies

The most essential factor in determining the best fitting implementation strategy is the *implementation uncertainty*. If the implementation uncertainty is high, caused by a strong resistance to change, or by a complex situation, a top down strategy is doomed to fail, so a bottom up strategy is more appropriate. Another important factor for strategy determination is *time pressure*. A bottom up approach requires considerably more time than a top down approach. If time pressure exists and the implementation uncertainty is medium high or high, the situation of the organization is worrisome; the time pressure requires a top-down strategy, but the uncertainty requires a bottom up approach. If the implementation project is continued in either way, top down or bottom up, the project is doomed to fail. Therefore the organization is advised to go back to the starting points of

the project and try to reduce time pressure, or reduce uncertainty by changing the situation before starting the implementation project again.

The combinations of time pressure and implementation uncertainty are represented in Figure 5. A *top-down, big-bang* implementation strategy is only suitable in a situation of low uncertainty and high time pressure. If time pressure is low and implementation uncertainty is low a *top down incremental* implementation might be carried out. A *full bottom-up* implementation strategy is the most adequate in a situation of low time pressure and medium or low implementation uncertainty. An *incremental bottom-up* implementation strategy is the most adequate in a situation of low time pressure and high implementation uncertainty.

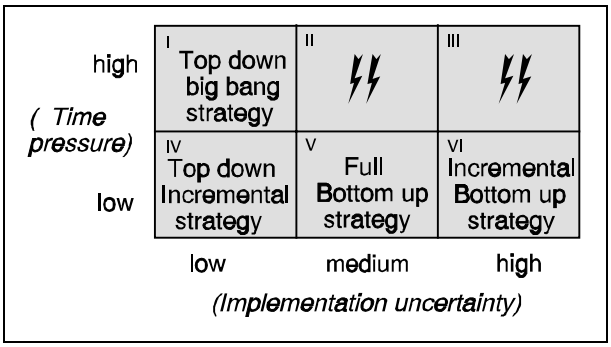

Figure 5: Position matrix for determining the implementation strategy

V. Developing the Quality System

The development of the quality system is contingent upon the implementation uncertainty and the implementation strategy, and consists of the development approach, the scope of the quality system, the contents of the procedures and the level of detail.

The *development approach* is determined by the implementation strategy and the complexity of the situation. In a top down implementation strategy participation and involvement is limited, in a bottom up approach it is stimulated.

The *scope* of the quality system is determined by the strategy for quality management; a strategy for certification determines the scope requirements. If the organization wants to obtain an ISO 9001 certificate, the scope of the quality system is described in the standard of ISO 9001. If quality management is introduced for purely internal reasons the organization has more freedom in determining the scope of the quality system.

The *contents* of the procedures of the quality system are mainly determined by the industry of the organization. Most quality system procedures are industry-, or even company-specific. Rijsenbrij and Bauer [11] give a good example for a software house. The procedures of process control of the software industry will be totally different from those in the chemical industry.

The *level of detail* is determined by the complexity of the situation and the culture of the organization. In an open, non-bureaucratic culture the level of detail of the quality system

procedure must be kept down to a minimum to increase acceptability. In a bureaucratic, formal culture the procedures might be more detailed.

VI. Managing Change

The implementation of a quality system often means a drastic change. This change has to be managed properly, which can be achieved by performing five major activities, as described by Cummings [12]. These activities are: motivating change, creating a vision, developing political support, managing the transition and sustaining momentum, and can be compared with the Lewin change model [13], which consists of three phases, unfreeze, move and refreeze. Both of these models are depicted in Figure 6.

The first activity involves *motivating change* and includes creating a readiness for change among organizational members and helping them to overcome resistance to change. This involves creating an environment in which people accept the need for change and direct physical and physiological energy to it. Motivation is a critical issue in starting change; most of the time people and organizations seek to preserve the status quo and are willing to change only when there are compelling reasons to do so.

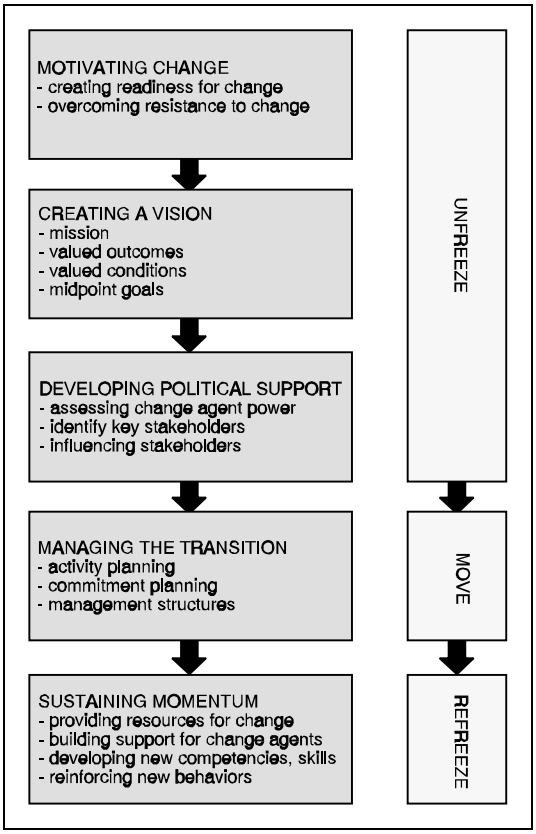

Figure 6: Activities contributing to effective change management

The second activity is concerned with *creating a vision* for a desired future state of the organization. The vision provides a direction for change and serves as a bench mark for assessing progress.

The third activity involves *developing political support* for change. Organizations are composed of powerful individuals who can either block or promote change, and change agents need to gain their support in order to implement changes.

The fourth activity is concerned with *managing the transition* from the current state to the desired future state. It involves creating a plan for managing the change activities, as well as planning special management structures to manage the organization during the transition period.

The fifth activity involves *sustaining momentum* for change so that it will be carried out to

completion. This includes providing resources for implementing the changes, building a support system for change agents, developing new competencies and skills, and reinforcing new behaviors needed to implement the changes.

VII. Maintaining Continuous Improvements

The introduction of quality management by the implementation of a quality system is a never ending effort. The quality system will have to be improved over and over, in order to be, and stay, workable. This often requires a change in the culture of the organization in such a way that continuous improvements are promoted and the quality system is maintained.
Corporate culture is the product of long-term social learning and reflects what has worked in the past. Culture can improve the ability of organizations to implement new business strategies, as well as to achieve high levels of excellence. On the other hand, efforts to implement a new strategy can fail because a company's culture does not support the new strategy. Therefore it is important to align the new strategy (the implementation of the quality system) to the organizational culture.

A company trying to improve its culture is like a person trying to improve his or her character. The process is long, difficult, and often agonizing. The only reason people put themselves through it is that it is correspondingly satisfying and valuable.
A quality system will gain a maximum result in a quality culture; therefore, companies that want to get the best out of quality management should try to achieve or sustain such a quality culture.

VIII. Conclusion

This paper describes ways in which quality systems can be implemented in organizations. Its main conclusion is that there is not *one* fixed way in which a quality system has to be implemented. More solutions are possible, but not all solutions will be equally effective. The implementation approach should be fitted to the situation of the organization. Only in this way is successful implementation possible.

This conclusion corresponds with the practical experience of senior quality consultants with whom we discussed our findings.

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In line with the spirit of quality management and continuous improvements we want to state that we do welcome suggestions for improvement of this paper. Please feel free to express your comments.
