

BUSINESS PROCESS RE-ENGINEERING TO TOTAL QUALITY MANAGEMENT:
AN EXAMINATION OF THE ISSUES

J. Gonzalez Benito*

A. R. Martinez Lorente, E.U.EE. Empresariales, Cartagena, University of Murcia, Spain.

B. G. Dale, Manchester School of Management, UMIST, Manchester, UK

* Corresponding author.

Address:

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ABSTRACT

This paper examines two research questions. Firstly, is a re-engineered company a suitable platform for the subsequent application of TQM principles? Secondly, is BPR an appropriate means to transform an organisation operating along traditional lines into one which is managed using TQM principles? It is argued that these questions have been given scant attention by the academic fraternity. The analysis presented in the paper indicates that the application of BPR can provide the base for the subsequent development of TQM.

KEY WORDS

Business Process Re-engineering, Total Quality Management, Continuous Improvement.

INTRODUCTION

In response to the globalization and growing competitiveness of world markets, companies are continually looking for different management recipes to get improvements into their business operations. A wide range of new philosophies such as lean production, world-class manufacturing, Total Quality Management (TQM) and Business Process Re-engineering (BPR) have been deployed as drivers to improve competitiveness, see Lee and Oakes (1996). Total Quality Management and BPR have been positioned at the two extremes of a spectrum of approaches focused on organisational change, see Elzinga et al. (1995). TQM is based on continuous improvement principles to facilitate change on a constant and progressive basis. BPR, on the other hand, advocates large step changes using structural process re-design, process re-engineering and a fundamental rethinking of the business; it is based on a 'clean-slate' approach. In spite of their differences, these two approaches are seen by some researchers as being compatible. For example, authors such as Love and Gunasekaran (1997)

have presented TQM as a good starter for BPR and MacDonald and Dale (1999) believe that BPR and TQM can be used jointly, since they have many common features.

In this paper it is argued that a company can apply TQM and BPR simultaneously and this will (*yo pondría "can" en lugar de "this will"*) yield more improvements than if only one of them was used on its own (see Figure 1). The application of BPR to any great extent involves considerable upheaval in the company and it is not a technique that can be used whenever a flaw is found in a process. Rather, according to the literature (e.g. Chan and Peel (1998) and Childe et al. (1994)) it is normally used on a once-and-for-all basis. The authors are of the view that successful BPR implementation has the potential to bring about a better process design but perhaps not the optimal one. Re-thinking a process is not a mathematical optimising procedure and any new process will be amenable to further improvements once it has been implemented and subjected to operating experience. TQM is a proven way to help make these further changes, on a continuous basis.

At this point in the argument two questions arise. First, is a re-engineered company a suitable platform for the application of TQM principles? There is not a standard pattern to fit every BPR application; each company re-engineers their processes in a different way, however, there are some similarities and common characteristics that can be found in any re-engineering project. It is worthwhile to analyse to what extent these characteristics favour or hamper the implementation of TQM. Second, could BPR be the appropriate means (*yo pondría "way"*) to transform a company operating along traditional lines into one in which the principles and practices of TQM are applied across the organisation? The purpose of the work described in this paper is to contribute some thought to the study and understanding of these two questions.

TQM AND BPR: PRINCIPLES AND COMPATIBILITY

Total Quality Management

As the end of the 20th century approaches TQM appears to be a well-accepted system of management, yet two decades ago the term was not used. The definition of TQM is not straightforward as almost every writer on the subject has their own definition, by and large devising it to suit their own beliefs, prejudices, and business and academic experiences. To some degree this is also true in the organisations which have introduced a TQM approach to managing the business. The result is a proliferation of unique definitions which confounds comparison and adds to the difficulties of understanding and analysis. Moreover, as Hackman and Wageman (1995) state, a large number of interventions not related with TQM are being encompassed under this banner, further complicating the issue of definition and understanding. Even with the publication of an international definition of TQM in ISO 8402 (1994) there is ample evidence that writers and researchers to (*no será "do"?*) not stick to this and create their own unique offering; this situation is described by Martinez et al.. (1998).

Despite the divergence of views on what constitutes TQM there are a number of common elements running through the various definitions (e.g. top management support, customer and supplier relationships, and employee involvement). Several writers have defined the different dimensions that shape TQM, including Ahire et al. (1996), Dale et al. (1994), Flynn et al. (1994) and Saraph et al. (1989). Table 1 contains an analysis of ten common dimensions in relation to traditional organisations and those that are managed along TQM lines.

Table 1 - TQM Dimension: Comparative Analysis of Traditional and TQM Organisations

DIMENSIONS	TRADITIONAL ORGANISATIONS	TQM ORGANISATIONS
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TOP MANAGEMENT	Top management tend to focus on the use of financial measures to evaluate process performance. They are rarely involved in making process improvements.	Top management are heavily involved in applying and stimulating the TQM approach and accept responsibility for the product and service offering. They provide the necessary leadership to motivate all employees.
CUSTOMER RELATIONSHIPS	Customer satisfaction is not the aim of all members of the organisation.	The needs of customers and consumers and their satisfaction is the focus of attention of all employees. A number of mechanisms are in place to identify these needs and their level of satisfaction.
SUPPLIER RELATIONSHIPS	Supplier selection is fundamentally based on price, other criteria are given scant consideration.	Quality is more important than price in selecting suppliers. Long-term relationship with suppliers has been established and the company collaborates with them to improve the quality of products/services.
WORKFORCE MANAGEMENT	Employees have low levels of empowerment and autonomy, and teamwork is rarely used.	Workforce management is guided by the principles of: training, empowerment of workers and teamwork. Adequate plans of personnel recruitment and training have been implemented to give employees the necessary skills to participate in the improvement process.
EMPLOYEE ATTITUDES AND BEHAVIOUR	The relationship between employees and management is antagonistic. Employees do not identify their aims with that of the organisation.	Management have stimulated positive work attitudes, including loyalty to the organisation, pride in work, a focus on common organisational goals and the ability to work cross-functionally.
PRODUCT DESIGN PROCESS	This is the responsibility of the design department and other departments are rarely consulted.	All departments participate in the design process and work together to achieve a design that satisfies the requirements of the customer, according to technical, technological and cost constraints.
PROCESS FLOW MANAGEMENT	The main emphasis is on detection and control activities. The use of quality management tools and techniques is given minimal consideration.	Housekeeping along the lines of the 5S concept. Statistical and non-statistical improvement instruments are applied, as appropriate. Efforts are made to mistake proof processes. Self inspection is undertaken.
QUALITY DATA AND REPORTING	Departments do not share information. Records about quality are sparse. Quality costs are not known.	Quality information is readily available and the information is part of the visible management system. Records about quality indicators are kept, including scrap, rework and cost of quality data.

ROLE OF THE QUALITY DEPARTMENT	Inspection.	Quality department have open access to top management and provide guidance on TQM. They facilitate the continuous improvement concept across the company.
BENCHMARKING	Benchmarking is not recognised.	A benchmarking policy for key processes is in place.

BUSINESS PROCESS RE-ENGINEERING

Business process re-engineering as an approach to radical organisational change is a relatively recent concept, emerging from the (*creo que sobre el "the"*) two seminal papers of Davenport and Short (1990) and Hammer (1990) which, in turn, gave rise to two popular books (Davenport (1993) and Hammer and Champy 1993)). It has become popular in a short period of time, promising amazing results very quickly in relation to corporate and technological change, transformation and competitive pressures. The protagonists of BPR argue that it, rather than TQM, is the concept which enables an organisation to make the necessary step changes, originality and improvement to the business which will enable it to leapfrog the competition. Re-engineering focuses on processes rather than departments, functions or tasks. It might be said that BPR aims at implementing the solution of an optimisation problem including the whole process and not just isolated stages. It also advocates radical changes rather than small and continuous improvements. Nonetheless, as noted by Grover and Malhotra (1997), this idea of radical change is being relaxed. A new field, Business Process Management, comprising all the approaches focused on the analysis of processes irrespective of the level of improvement sought has emerged and this is considered by writers such as Elzinga et al. (1995), De Toro and McCabe (1997) and Zairi (1997) to be a better option. In this study, the original definition of BPR will be considered with process focus and radical change being considered as its major characteristics.

BPR is more an idea or philosophy than a method or state. The main objective is to rethink the processes to find a better design, and hence, multiple methodologies and infinite results can be found; Hammer and Champy (1993) claim there are no rules for this. Kettinger et al. (1997) carried out an exhaustive comparison of methodologies and concluded that, in most cases, common stages can be identified. These stages are not very different from those proposed by Grover and Malhotra (1997) as below:

- ⇒ Top management commitment
- ⇒ Creating a team
- ⇒ Evaluating the environment
- ⇒ Assessing the organisation
- ⇒ Defining the changes needed
- ⇒ Determining the technical and human resources which are needed
- ⇒ Testing, when appropriate
- ⇒ Implementation
- ⇒ Evaluating the results

TOTAL QUALITY MANAGEMENT AND BUSINESS PROCESS RE-ENGINEERING

Some authors consider that re-engineering and TQM are compatible. According to Love and Gunasekaran (1997) and De Bruyn and Gelders (1997) TQM is an enabler of re-engineering. Harrington (1995), Kelada (1994) and MacDonald and Dale (1999) consider that TQM and re-engineering are complementary and that re-engineering needs to have TQM aims at the forefront of its application in order to be successful. Grover and Malhorta (1997) consider that TQM can often serve as the building block for subsequent re-engineering efforts.

On the other hand, Leach (1996) argues that continuous improvement is a better and less risky means of making changes in a company than re-engineering, claiming that a continuous improvement process helps to maintain stability. He also argues that re-engineering does not allow employees to assimilate the changes made and that when re-engineering leads to downsizing, the commitment of employees decreases. According to Miller and Pearce (1988), gaining employee commitment to improvement efforts can be difficult when both quality and innovation are of concern. MacDonald and Dale (1999) have also analysed the differences between TQM and re-engineering and amongst their conclusions are:

- Large step changes are riskier, more complex and more expensive than continuous improvement.
- Re-engineering places more emphasis on equipment and technology rather than people; TQM is the opposite.
- Re-engineering tends to concentrate on one process at a time using a project planning methodology, whereas TQM takes a more holistic view of the organisation, building improvement into all aspects of business operation.

Dixon et al. (1994) have studied companies which have simultaneously developed TQM policies and re-engineering initiatives and found there were several similarities. In both cases the size of the project affected the entire company, the improvement rate was similar, cross-functionality was a requirement, IT was important for re-engineering and considered to be useful for TQM, and management support was needed in both initiatives. The main underlying difference is that with TQM changes were made with the active participation of employees, whereas with re-engineering changes were dictated by top management.

Rohleder and Silver (1997) have developed a framework for business process improvement that uses elements of both re-engineering and TQM. For example, benchmarking is proposed as the technique to select the processes which need to be improved, Pareto Analysis is used to identify the most important processes on which to work, and SPC as the means to determine

if a process meets the targets that have been identified and, thus, decide if radical change is necessary.

Most of the authors have focused on the role of TQM as a facilitator of or cohabitant with re-engineering but not much attention has been paid to the role of BPR as an enabler of TQM. Childe et al. (1994) notes that one of the benefits of BPR is that it “establishes mechanisms to ensure continuous improvement of the re-design processes.” The remainder of this paper will focus on this issue, contributing to an extension of the underlying knowledge.

TQM ON RE-ENGINEERED ORGANISATIONS

This section of the paper identifies some common characteristics of re-engineered companies which favour or hamper the implementation of a TQM philosophy. As pointed out by Hammer and Champy (1993) there are no fixed rules for BPR but, nevertheless, some features are likely to be found in any organisation which has undergone BPR. These features are reviewed to highlight how some of them might affect an organisation’s application of TQM principles.

Characteristics of BPR which facilitate TQM

BPR and TQM both lead to organisational change. When an organisation has undergone BPR, the need for change has been internally transmitted. The usual result of this is that employees become more conscious of the need for improvement and that a static position cannot be maintained if the organisation wishes to successfully compete in the marketplace. Thus, a re-engineered organisation might have acquired a culture for change and improvement which is conducive to TQM. In addition, BPR might be perceived as a blunt method to introduce dynamism and awake the organisation from its traditional position. After

a radical change in the design of the process, continuous improvement would perhaps be seen as contributing to adjustments and improvements to the re-engineered process.

According to Kaplan and Murdock (1991), one of the benefits of BPR is that it links improvement efforts to strategic goals. Kettinger and Teng (1998) consider that successful BPR relies on appropriate understanding on the part of strategic planners. On the other hand, TQM needs to become part of company strategy to be successful and for improvement to be sustained (*esta frase no me suena bien, no se si está mal escrita o es mi inglés*), see Dale (1997). Thus, a re-engineered organisation tends to include improvement objectives in its strategic planning process and this contributes to fostering the view of that TQM needs to be integrated with business strategy.

In a re-engineering approach, as noted by Dixon et al. (1994), changes are dictated by top management whereas TQM require the active participation of employees across the organisational hierarchy. Nonetheless, this means that successful BPR is supported by top management, who are therefore concerned with improvement. According to Dale et al. (1997) lack of top management support and commitment is one of the main reasons for TQM failure. This barrier might be less in re-engineered organisations, where top managers are more aware of the need for radical improvement in processes to maintain competitiveness.

Although BPR is fundamentally designed and controlled from the top of the organisation, BPR principles must be communicated company-wide, and training and education programmes implemented to teach employees their tasks in the new process design, see Grover and Malhotra (1997). In this way, organisations develop effective vertical and horizontal communication channels, and a training and education infrastructures which are very useful for the implementation of TQM, which also relies on employees' awareness and

development.

Workers in re-engineered organisations are usually empowered to have the authority to make decisions and assume more responsibility for checking and controlling their processes, see Hammer and Champy (1993). This is in line with TQM principles which advocate for greater involvement of employees in the business. Employees in a re-engineered organisation are usually capable of carrying out a wide range of activities and are used to assuming responsibility for the processes under their control. This will assist the subsequent development of a TQM approach.

According to Guimaraes and Bond (1996) middle management reluctance is a major barrier to successful implementation of BPR. This is mainly due to the fact that re-engineered processes tend to eliminate the need for intermediate layers of management and thereby simplify the management structure. A major consequence of this is improved vertical communications which is an essential element of TQM.

As noted by many authors (e.g. Kaplan and Murdock (1991) and Zairi (1997)), BPR breaks down inter-functional and geographical boundaries. The unit of analysis is the process and this does not restrict action to one function of the company. The use of inter-functional and interplant teams is frequent (e.g. Dixon et al. (1994)) and suppliers and customers are incorporated in the planning of the new processes (e.g. Kaplan and Murdock (1991)). These characteristics will benefit any management approach which has a process focus and, in particular, TQM.

After the successful implementation of BPR, customer service has usually been improved

(e.g. Chan and Peel (1998) and Guimaraes and Bond (1996)). Moreover, the figures of 'process owner' and 'case manager', which are frequently used in re-engineering (e.g. Hammer and Champy (1993)), constitute a good interface between customers and the organisation as they have a global vision of the process and customers' interests and requirements with respect to process needs. In this situation it is possible for one person to inform the customer about the whole process, consequently a better idea of what customers are expecting is obtained. This implies a better flow of information from the market into the organisation, which is essential for the successful implementation of TQM.

Kettinger et al. (1997), in their review of methodologies, techniques and tools used for BPR, consider benchmarking to be important to analyse existing processes and design new ones. Thus, a re-engineered organisation has developed resources and experience in the use of benchmarking, which is also fundamental to the advancement of TQM.

Characteristics of Business Process Re-engineering which hamper TQM

The main criticism against BPR is that it frequently brings about downsizing and, as a consequence, the opposition and lack of commitment of employees (e.g. Leach (1996)). This might present a barrier to the introduction and development of TQM since it is likely that employees will not be too eager to participate because of distrust from the previous bad experience of BPR. With re-engineering, many non-value-added activities and operations are eliminated and this will lead to displacements of employees from their current positions. Those companies who are able to relocate their employees in other positions can contribute to improving the working atmosphere and levels of trust. The application of TQM can also lead to similar changes. We have knowledge of a U.K. automotive industry supplier which

motivated its employees to participate in continuous improvement by guaranteeing sustained employment; this has been possible by the continuous growth that the company has experienced over many years. In the case of BPR, the application of this employment strategy would require radical growth, which is not always possible.

As mentioned earlier, BPR develops top-down channels of communication; those in the opposite direction are not given priority. Employees in today's organisation have become used to changing their working habits and are usually willing to take part in training and education programmes to facilitate the necessary changes but they tend to be more used to assuming change rather than generating it. This might present a handicap for TQM since employees are expected to make continuous improvements in the processes for which they are responsible. Nonetheless, as noted by Grover and Malhotra (1997), some companies are involving line workers in the design of new processes.

TQM CONSIDERATIONS WHEN RE-ENGINEERING

This section addresses the second research question: could BPR be an appropriate system to transform a traditional managed company into a TQM company? To analyse this question it is necessary to consider what factors organisations should take into account at each stage of a BPR methodology in order to become closer to one which is managed along TQM lines. This is addressed using the nine stages of a BPR project outlined earlier in the paper.

1. Top management commitment.

Top management has to be convinced of the need for TQM. If a lack of commitment exists, the problems that can appear in the process of change implementation can undermine any

efforts to build a TQM approach onto BPR. Therefore, this stage is the key to initiate the type of thinking, behaviour and attitudes which TQM demands.

2. Creating a team.

Selecting members. TQM affects the whole organisation, so team members have to represent all departments. They should have authority to implement the changes and possess the leadership capacity to motivate people into participation. The quality department can assume the role of co-ordinator of this task.

Training members in BPR and TQM. Members of the team have to be trained in the philosophy and practices of both BPR and TQM.

3. Evaluating the environment

Consumers' needs, requirements and demand. Customer needs and requirements (current and latent) drive a TQM approach to managing a business. Special emphasis should be put on finding out customers requirements using a range of measuring instruments to listen to 'customer voices'.

Competitors products and quality. Consumers evaluate the quality of a product and/or service in comparison with other offerings. Therefore, a systematic process of competitive analysis needs to be in place.

4. Assessing the organisation

Company (or brand) actual reputation. The image of the company and its brands is a basic element in defining the aims of a TQM policy. A traditional organisation can have a good

reputation but at the expense of being cost uncompetitive. In this case, the aim should be to maintain and improve the reputation and competitive position of the organisation. If the reputation of the organisation has become tarnished, the aim should be to improve, not only through better product and service quality offerings but also through a marketing policy that helps to communicate to consumers a new commitment to quality.

Existing quality problems. Some of the most common problems facing traditional managed organisations are: high defect rates, excessive inspection costs, lack of communication, unsatisfied employees and dissatisfied consumers, leading to high levels of operating costs. These problems and their causes should be identified.

Employees commitment. Employees commitment is a key point for the success of a TQM policy. The level of employee satisfaction and their commitment to the organisation needs to be evaluated prior to the introduction of TQM. If a lack of the appropriate commitment has been identified, the reasons have to be pinpointed and the appropriate means to change this situation analysed and put into place.

Level of training of employees and the potential for increasing their skills and knowledge. A traditional organisation does not attach great importance to training and the level of employee skills and knowledge is likely to be low. If an organisation does not apply an adequate policy of recruitment, it is also possible that the basic knowledge and skills of employees will be basic. To generate a culture of continuous improvement after BPR, the training and education processes should not be considered as a temporary intervention or relating just to the implementation of re-engineered processes. Training should be considered as a permanent process to increase employees' understanding, knowledge and skills.

Workforce management system. The workforce management system has to be analysed with respect to the degree of concordance with the approach proposed by TQM. This has to stimulate teamwork and establish an appropriate incentive system and leadership to produce the necessary loyalty to the organisation, pride in work and a focus on common organisational goals.

Suppliers relationships. The role of suppliers should be taken into account at the beginning of the re-engineering process; suppliers must be regarded as partners and not as adversaries. The supplier selection processes, traditionally based on price, should be radically changed so that quality and reliability gain relevance.

Level of inter-departmental communication. Communication between different departments tends to be weak in traditionally managed organisations. The barriers to communication have to be identified to analyse ways to eliminate them and put in place new methods and mechanisms.

Use of quality management tools and techniques. Traditional organisations only use quality management tools and techniques in a limited way or use them improperly, see Dale and McQuater (1998). In a TQM approach, employees at all levels of the organisational hierarchy should use a range of tools and techniques within a systematic problem solving approach. This is in line with the BPR philosophy, but it must be borne in mind that the company must continue with their improvements in the TQM approach. The use of the tools and techniques is strongly related with the level of employee training, so appropriate analysis must be conducted in accordance with training needs.

Product design process. In a TQM organisation, design is carried out with the participation of

different departments so that it is possible to maximise customer satisfaction while exploiting resources and technological capabilities. In this concurrent approach to new product design and development all the departments participate at the same time, creating design teams involving supplier and customer representatives. In a traditional organisation the design process is based on a series approach.

5. Defining the changes needed.

Once the analysis of the environment and organisation have been done the next step is to decide what changes are necessary. The importance of these changes will depend on the difference between the traditional organisation and the ideal TQM organisation. The EFQM Model for Business Excellence and/or the criteria of 'Tomorrow's Company' can provide this template. A benchmarking approach can also help to identify possible changes, determine which are the most important and how to implement them. This task should be undertaken by the team created to manage the BPR project.

6. Determining the technical and human resources which are needed.

The change to a TQM organisation does not necessarily imply huge investments in new technical and human resources. Much of the basic work can be done by the management team using external consultants, as appropriate, to help with specific implementation activities. The basic human resources are the actual employees and all of them have to be involved in the task of transforming the organisation. The technical resources are less important in TQM than they are with BPR since it is more related with the way people work rather than with changes in machinery and equipment.

7. Testing, when appropriate.

Using a specific business unit to test the results of the plan can be useful to identify any mistakes and avoid them in the general implementation.

8. Implementation

Introduction of TQM. The introduction and development of TQM begins with training, education and the motivation of personnel and other necessary changes in the workforce management system.

Defining mechanism for unanticipated problems. Unexpected situations can appear with the best planning process and it is normal to find some unanticipated problems. If appropriate procedures are in place to face these problems their effects can be reduced.

Managing resistance. One of the most common problems is the resistance of employees across all sections of the organisational hierarchy to make the necessary changes. This resistance should be anticipated and ways to overcome it given adequate attention.

9. Evaluating the results

The results of TQM should not be seen in the short term. The time that customers come to recognise the improved quality of the company's product and services can also be long; this is perhaps more the case for consumer businesses than it is in the industrial situation. TQM is based on a continuous improvement process, therefore the continuous evaluation of results will be the signal of whether the company is applying the concept in the right way.

CONCLUSIONS

This paper has contributed to the research argument dealing with the interface between TQM

and BPR. The majority of the research reported in the literature focuses on issues surrounding the combination of both approaches or highlighting the consideration of TQM principles before starting up a comprehensive re-engineering of an organisation, or on the difference between BPR and TQM. On the other hand, this work has indicated how the suitability of an organisation to develop a TQM approach can be analysed after the application of a BPR programme.

Two research questions have been proposed and addressed. Firstly, is a re-engineered company a suitable platform for the introduction of a TQM approach? In relation to this, characteristics which favour and hamper the adoption of TQM principles in a re-engineered organisation were reviewed, observing that there are many complementary factors which make successfully re-engineered organisations to become closer to those managed along TQM lines. Secondly, could BPR be an appropriate system to transform a traditional company into one operating along TQM lines? In order to make this transformation a summary of the factors that should be taken into account in each one of the nine stages of a BPR project proposed in this paper were commented upon.

Although the authors recognise further research is needed and the above analysis provides only a broad set of guidelines, the application or adaptation of BPR methodologies for the implementation of TQM principles seem to be possible.

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