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CHAPTER 3

Improving the EFQM Model: An empirical study on model development and theory building using Concept Mapping

Udo Nabitz, Peter Severens, Wim van den Brink, Paul Jansen

CHAPTER 3

Abstract

The aim of this study is to identify the elements and to design a structure for the Improved EFQM Model. This task was given by the Governing Committee of the European Foundation for Quality Management (EFQM) to the steering group Model Development composed of 17 members from different European organizations. First the literature was reviewed and the different award programmes were analysed. In order to process all the information collected the method Concept Mapping was used. The result of the Concept Mapping was 13 distinct clusters, which were in large part a replication of the EFQM criteria but with more emphasis on Customer, Suppliers and Partnership and a cluster Measurement system and Results. The comparison of the clusters with the international award schemes shows great resemblance concerning customer orientation, policy and strategy, leadership, process management and business results. The comparison with the empirical findings of other authors points in the same direction. The design team of the steering group proposes a prototype for the model and an Improved EFQM Model. The Improved EFQM Model Draft 1 has eleven criteria, a strong focus on customer orientation and a new measuring system. The Improved EFQM Model is the result of the first phase of the model development process. In the second phase the model will be tested in various ways. It is known that the results of the testing turned out different than expected. The test phase and the final EFQM Excellence Model will be published later.
Introduction

In 1991 Garvin published his article: “How the Baldrige Award Really Works” in Harvard Business Review. In this article he concludes that the Baldrige Award is an ideal conceptualisation of Total Quality Management, not too narrow and not too broad. He concludes, that the seven pillars of the award “have created a common vocabulary and philosophy bridging companies and industries” (Garvin, 1991). More than twenty American experts in the field of quality reacted to the publication; most of them very positively and with general approval (Debate, 1992). However, Deming and Crosby were strongly opposed. In their opinion the Baldrige Award criteria concentrate too much on business results and quality control. The debate was closed with an open letter from business leaders encouraging academics to do research in order to get more insight and facts regarding the quality principles. Six years later the Baldrige criteria were revised and the criteria for performance excellence were launched.

A similar process took place during the last years in Europe. The European Foundation for Quality Management (EFQM) Model was launched in 1991 and the first award winner was decorated in 1992. The reactions of the European profit and non-profit organizations were very positive about the EFQM award scheme (Zink, 1995). Within a few years many companies used the tool of self-assessment and introduced the EFQM for criteria business excellence. In contrast to the US, however, the EFQM criteria were not only applied by businesses but also by organizations of the public sector. It was also typical for the European situation that many traditional national quality organizations were critical about the framework and modified the model to meet their specific needs (Hardjono, & Hes, 1996). Although, research in the field of quality was growing and the criteria of EFQM were reviewed annually, the need for a more fundamental debate on the model increased. In 1996, the Governing Committee of EFQM initiated a revision process in order to develop an Improved EFQM Model.

In this article a description is given of the first phase of the development process which was carried out by the Steering Group Model Development. In the second phase of the process the model has to be tested by different users such as organizations, assessors and experts. There will be separate reporting on the testing. The first phase is characterised by the use of a specific consensus procedure called Concept Mapping. The steps of this approach are described. The results are presented and discussed in the light of other major award schemes and the empirical literature. Finally, the prototype for the improved EFQM Model and the final proposal for the Improved EFQM Model are presented.
CHAPTER 3

Method

There is no standard empirical approach to develop or improve a model or a quality framework. A method had to be found to use the knowledge of experts in a structured and systematic way to come up with a proposal for the Improved EFQM Model. After selecting the method Concept Mapping a study was conducted and the procedure and results were integrated and presented under one heading.

Steering Group and goal setting

As a first step the Governing Committee of EFQM appointed a model manager and installed the Steering Group Model Development. The assignment was to determine the elements and to propose a structure for the improved EFQM Model for organizational excellence. Furthermore, the Governing Committee required that the improved EFQM model should align with the current EFQM model shown in Figure 1, and that it should reflect the world-wide state-of-the-art in quality management and business excellence. Finally, the Governing Committee required the Steering Group to work stepwise, transparently and with some consensus procedure.

Figure 1: EFQM Model 1996

The Steering Group members were selected in such a way that a good mix of professional expertise, types of organizations and cultural backgrounds was guaranteed. Table 1 lists the members with their position, branch, organization and country.
Selecting a method

The first task for the Steering Group was to select a method or procedure to develop the improved model. Four possible methods were considered: (1) the expert group approach; (2) the Delphi method; (3) the broad survey approach; (4) the statistical approach.

1. A good example of the expert group or forum approach is the review process of the Baldrige Award. In this approach a small group of "overseers" with an independent position meet and generate proposals for improvement based on consensus or a majority of votes of the group.

2. The Delphi method is a systematic reviewing procedure developed by the RAND Corporation. A panel of experts is selected. The experts give their view on written proposals. These reactions are used to merge similarities and to separate differences. Normally several iterations are needed until consensus is reached. Andersson used this method to generate a theory for quality management based on the 14 steps of Deming (Anderson, Rungtusanatham, & Schroeder, 1994).

3. The review process of the ISO norms is a good example of the broad survey approach. Everybody who is working with the ISO norms can contribute. The survey is world-wide and is coordinated by an international committee. Based on the survey results, a committee writes proposals and these are circulated again. In this way the committee gradually moves towards the final version of the new
4. The statistical approach implies that a strict research design will be used: the research question is operationalised and a random sample from the target population is drawn to answer questions and to give opinions. The data is statistically analysed and the results are interpreted in the context of other research findings. The work of Saraph (1989) is a good example of this approach.

The forum and the Delphi method are inductive approaches, which have the advantage that the expertise of the participants is fully used. The knowledge, creativity and innovative power from the field are directly translated into the development of the new model. However these approaches are not very democratic and not fully transparent. In contrast, the survey and statistical approaches are deductive procedures, which are more democratic and highly transparent. The decision making and data processing is fully standardised and can easily be replicated. These approaches, however, do not guarantee an adequate and direct use of all the available expertise. The Steering Group concluded that the best procedure to develop an Improved EFQM Model should take the best of both worlds and combine the inductive aspects of the forum approach and the deductive aspects of statistical procedures. The method of Concept Mapping seems to be a good mix of induction and deduction and was, therefore, selected by the Steering Group.

**Concept Mapping: Procedure and results**

Concept Mapping is an applied procedure, which was developed in the fields of educational, social, cognitive and management science in order to generate conceptual frameworks based on specific items. It is a stepwise approach in which statements are generated, rated, statistically analysed and finally interpreted. The method is used to create clarity, to develop a model or to specify a conceptual framework. In most studies, the six steps of Trochim (1989) are used to define a framework or to specify a model (Figure 2).

The first step of the Concept Mapping procedure covers the preparatory work and includes the description of the context and the specification of the goal of the study: the group of participants is determined and the focus of the concept map is clarified. In the second step, statements are generated and formulated. There should be at least 30 and no more than 100 statements in a concept map. The third step is the rating of the statements. Each participant has to rate each statement in two ways: first the priority of each statement has to be given and then the statements have to be grouped into internally consistent clusters. In step four the statistical analyses are performed, resulting in a number of statistics and several two-dimensional point...
and cluster maps. The fifth step is the interpretation. The results, in the form of the point and cluster maps, are presented to the participants and are discussed in order to find titles and descriptions. The sixth and last step of concept mapping is the utilization of the results, e.g. the development of a prototype for an Improved EFQM Model.

I. Preparation

Two essential topics have to be dealt with in this first step. The participants in the concept mapping process have to be selected and the focus and scope of the process have to be determined. The group of participants should be heterogeneous, representing a wide range of views. In the current study the requirement of heterogeneity is clearly met: the members of the Steering Group represent different professional backgrounds, different types of organizations as well as different national and cultural backgrounds.

The focus for the concept map procedure was derived from the assignment of the Governing Committee, i.e. to identify the elements for an Improved EFQM Model and to propose a structure. The elements should reflect the state-of-the-art in quality management in general and the scope should be the knowledge and expertise world-wide. In order to meet these criteria, a literature search and a review of existing award programmes was started.

The literature search resulted in more than 1000 articles and books published since 1985. However, the vast majority of these publications consisted of theoretical essays and case studies. Among them, the classical works of Deming (1986), Juran (1989), Crosby (1979), and Ishikawa (1985). In the current project, special attention was given to papers with empirical findings. For example, in a survey among 198 German business representatives, Schildknecht comes to the conclusion that there is a gradual change from specific quality aspects towards an integrated concept of quality management (Schildknecht, 1992). The author proposed a model combining the socio-technical approach enhanced with internal and external customer ori-
entation. In a Dutch survey covering 704 Dutch organizations, Dijkstal found some evidence that the structure of the enablers of the EFQM model was empirically confirmed (Dijkstal, 1997). In a survey among 169 American general and quality managers, Saraph extracted an eight factor model using factor analytic procedures (Saraph et al., 1989) (see also discussion and Table 4). Using similar procedures, Black and Porter performed two studies. In their first study they used the 78 item questionnaire developed by Saraph to survey European general and quality managers. Factor analysis resulted in nine major factors. In their second study they incorporated items from the Baldrige framework mainly from the non-result criteria. Using factor analysis, Black and Porter proposed ten critical factors of Total Quality Management with strategic quality management and customer satisfaction orientation as two of the most important aspects (Black & Porter, 1995) (see also discussion and Table 4).

In addition to the literature review, a thorough analysis was performed on the most prestigious award programmes with special emphasis on the constituent elements of these models (see also discussion and Table 3). The Steering Group contacted the representative offices of the programmes and conducted a world-wide investigation. In America the Baldrige Award (Baldrige National Quality Programme, 1997) was visited to learn more about the revision of the Baldrige Model in 1997. In Australia the TQM model was analysed and information was collected about the use of the approach in non-profit organizations (Australian Quality Council, 1997). Finally, interviews were held with the Japanese and South African Award representatives.

2. Generation of statements

In step two of the Concept Mapping procedure, a set of statements has to be generated, which ideally represent the entire conceptual domain. Based on the literature review and the analysis of the various award programmes, a documentation package of several hundred pages was distributed to all members of the Steering Group. The assignment was to select all relevant elements for an Improved EFQM Model for excellence in organizations and to present these elements in the form of a sentence. A total of 864 sentences were formulated.

In a meticulous content analysis, the Editorial Team of the Steering Group found an overlap of more than 50% in the 864 sentences, leaving 400 unique sentences for further analysis. Of these, 80 sentences were judged not to be directly relevant for the model development, leaving 320 sentences: 70 sentences covering new aspects of organizational excellence, and 250 sentences covering existing aspects of quality and organizational excellence. Through a careful process of stepwise reviewing and reformulating, the 250 “old” sentences were merged into 60 final statements and the
Table 2: Examples of statements

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Statement</th>
<th>Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How strategic intent is translated into plans that are aligned and prioritized.</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>How the organization manages the overall value chain.</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>What are the key financial results of the organization?</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>How the organization develops people through team work.</td>
<td>62</td>
</tr>
<tr>
<td>5</td>
<td>How the organization demonstrates its use of knowledge and organizational learning.</td>
<td>90</td>
</tr>
</tbody>
</table>

70 “new” sentences were merged into 30 final statements.

3. Rating of statements

In the third step, the actual rating of the statements by all members of the Steering Committee was carried out. The reformulated statements were sent to the home address of the members in the form of cards. Each card had one statement. Two sorting instructions were given. The first instruction was to arrange the statements into homogeneous groups and to give each group a name. The second instruction was to assign a score between 1 and 5 to each statement according to the estimated importance of each statement.

In this rating process each Steering Group member made many choices which reflect his personal opinion concerning the importance and meaning of the statements and the relationships between the statements. These ratings reflect specific cultural, professional and organizational backgrounds of the raters as well as personal views on the content and structure of quality management.

4. Statistical analysis

The data was analysed following step four of the procedure using ARIADNE, a statistical software package for the analyses of group and priority data of concept mapping procedures developed by Severens (1995). The data is represented in two matrices. The association matrix represents the probabilities of paired statements. The priority matrix is the distribution of all statements over the five priority categories. The rating of each member of the Steering Group is handled equivalently. Based on the association matrix, the software program calculates a multidimensional scaling solution. The values of each statement are plotted in a two-dimensional point map (Kruskal, & Wish, 1978). The coordinates of this point map are used as input data for a hierarchical cluster analysis (Gordon, 1981). The result of this analysis is a so-called cluster map, indicating the clustering of statements and the position of each
cluster in the two-dimensional space of the point map. In the course of an extensive data entry and data cleaning procedure, 14 statements were detected which either were negatively commented on by the raters or did not meet statistical requirements (e.g. low averages). These items were deleted from further analysis. The final statistical analyses were performed on 76 statements.

5. Results and interpretation
Statistical analyses delivered the material for step five of the Concept Mapping procedure. Thirteen separate clusters with different weights for each cluster were identified. The three most important clusters are Managing Customer Value, Market and Customer Focus, and Customer Interface Effectiveness. The least important clusters are Innovation and Ethics and Contribution to Society (Figure 3).

The cluster map shows the relation of the clusters to each other in a two-dimension-
Figure 4: Cluster map

Based on the relative position of the clusters to each other, the Steering Group attached the label Stakeholder to the horizontal and Process Management to the vertical dimension. Stakeholder refers to all parties with some interest in the organization. The people who work in the organization form the left pole of the dimension, the right pole is formed by customer interests. The horizontal dimension can also be described as the connection between enablers on the left side and results on the right side. The vertical axis Process Management connects Market Research, and Policy and Strategy in the lower part with everyday Process Management in the upper part of the two dimensions. The poles of the dimension are internal operations and external market orientation. Figure 5 shows the point map with the labels attached to the different dimensions and poles.

In a final discussion of the Steering Group it was concluded Stakeholders and Process Management are indeed essential aspects of a new model. It was also concluded that the important distinction between enablers and results was generally confirmed in the study. The role of innovation as a separate activity was found to be less crucial than expected. The central position of the cluster measurement system and results was discussed elaborately. The findings of the study were judged to gen-
eraly confirm the existing EFQM model with a different emphasis on some aspects of the model, e.g. more emphasis on the market, the customer, partnership, results and a measurement system.

6. Discussion and utilisation of the results
The 13 clusters of the concept map and the ranking of the clusters are the final results of the Concept Mapping procedure which is step six. They are the critical elements for the Improved EFQM Model. In order to prevent unnecessary mistakes in the construction of an Improved EFQM Model based on these elements, a last comparison is made between the clusters resulting from the current study and those resulting from an analysis of existing award programmes and empirical studies mentioned in the introduction.
Table 3: Concept map clusters and the award programs of 1997

<table>
<thead>
<tr>
<th>Concept Map Weights</th>
<th>Concept Map 1997</th>
<th>South African Award 1997</th>
<th>EFQM Award 1997</th>
<th>Deming Award 1997</th>
<th>Australian Award 1997</th>
<th>Baldrige Award 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Managing customer value</td>
<td>Customer satisfaction</td>
<td>Customer satisfaction</td>
<td>Customer satisfaction</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Market and customer focus</td>
<td>Customer and market focus</td>
<td>-</td>
<td>Understanding of and response to customer and market</td>
<td>Customer focus</td>
<td>Customer and Market Focus</td>
</tr>
<tr>
<td>3.</td>
<td>Customer interface effectiveness</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>Policy and strategy</td>
<td>Policy and strategy</td>
<td>Policy and strategy</td>
<td>Development and deployment of strategy</td>
<td>Strategy, policy and planning</td>
<td>Strategic Planning</td>
</tr>
<tr>
<td>5.</td>
<td>Supplier and partnership relationship Leadership and management style</td>
<td>Supplier and Partnership Performance</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>Measure, system and results</td>
<td>Resources and information manag.</td>
<td>-</td>
<td>Sharing and utilization of information</td>
<td>Information and analysis</td>
<td>Information and Analysis</td>
</tr>
<tr>
<td>9.</td>
<td>People management effectiveness</td>
<td>People satisfaction</td>
<td>People satisfaction</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11.</td>
<td>People and knowledge management</td>
<td>People Manag.</td>
<td>People Manag.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12.</td>
<td>Innovation ethics, contribution to society</td>
<td>Impact on society</td>
<td>Impact on society</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>13.</td>
<td>-</td>
<td>-</td>
<td>Resources</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Comparison with the existing award schemes

Table 3 shows the relationships between the 13 clusters of the concept map and the different criteria of the current EFQM Model and the other four major award programmes.

Together, the clusters of the concept map constitute a very comprehensive listing of elements, covering (almost) all elements of the existing award programmes and adding one unique element (Innovation). The clusters of the concept map closely resemble the South African Award with the exception of Innovation, which is lacking in the latter one. The results of the concept map are also highly compatible with the existing EFQM Award. However, the concept map calls for more emphasis on
market and customer issues and on the supplier and partner relationship. The other major award programmes seem to be somewhat less comprehensive, with no clear interest in some of the major customer issues, people management, impact on society, supplier and partner relationships, and innovation. However, an exception should be made here for the Baldrige Award, because within this model the element Business Results has five sub-elements covering Customer Satisfaction Results, Human Resource Results, Financial and Market Results, Supplier and Partner Results and Company Results. Therefore, the Baldrige Award can be regarded to be rather comprehensive and very similar to the results of the current concept mapping procedure. Finally, the comparison shows that there are six criteria, which are represented in all awards: Customer Orientation, Policy and Strategy, Leadership, Process Management and Business Results. Together, these criteria can be regarded as the stable and consistent elements.

Comparing the concept map with the existing empirical findings

Table 4 shows the comparison between the results of the concept map and the empirical findings of Saraph (1989) and of Black and Porter (1995). The comparison between the ten critical factors of Black and Porter and the clusters of the concept map is much closer than the comparison with the eight factors of Saraph. It is, however, remarkable that Black and Porter did not find a factor for process management and that market orientation is not represented. Only five factors of Saraph’s study relate to the 13 clusters of the concept map. Moreover, the factors Product Service Design, Training and Role of the Quality Department are neither replicated by Black and Porter nor are they in the concept map. These findings are an indication of the changing conceptual framework for total quality management. The study of Saraph was conducted in 1987 and published in 1989. Apparently, ten years ago, the aspects of Customer Orientation, Policy and Strategy and People Management were supposed to be less important for total quality management, whereas topics like Training and Employee Support were supposed to be more important then today.

Two methodological differences between the concept map results and the factor analytic results of Saraph and of Black and Porter have to be mentioned. First, the questions in the inventories of Saraph and of Black and Porter were focused on enablers and not on results. This might be an explanation for the missing factors for Business Results and Contribution to Society. Second, different statistical procedures were applied in our study compared to the other two studies. These differences can account for some of the discrepancies between the factors and the clusters.
Table 4: Concept map with 13 clusters, Black & Porter and Saraph

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Managing customer value</td>
<td>Customer satisfaction orientation</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Market and customer focus</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Customer interface effectiveness</td>
<td>External interface management</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>Policy and strategy</td>
<td>Strategic quality management</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Supplier and partner relationship</td>
<td>Supplier partnerships</td>
<td>Supplier quality management</td>
</tr>
<tr>
<td>6.</td>
<td>Leadership and management style</td>
<td>Corporate quality culture</td>
<td>Top management leadership</td>
</tr>
<tr>
<td>7.</td>
<td>Measurement system and results</td>
<td>Quality improvement systems</td>
<td>Quality data and reporting</td>
</tr>
<tr>
<td>8.</td>
<td>Process management</td>
<td>-</td>
<td>Process management</td>
</tr>
<tr>
<td>9.</td>
<td>People management effectiveness</td>
<td>Teamwork structures</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Competitive positioning</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11.</td>
<td>People and knowledge management</td>
<td>People and customer management</td>
<td>Employee relations</td>
</tr>
<tr>
<td>12.</td>
<td>Innovation</td>
<td>Communication of improvement information</td>
<td>-</td>
</tr>
<tr>
<td>13.</td>
<td>Ethics, contribution to society</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(14)</td>
<td>-</td>
<td>Operational quality planning</td>
<td>-</td>
</tr>
<tr>
<td>(15)</td>
<td>-</td>
<td>-</td>
<td>Product service design</td>
</tr>
<tr>
<td>(16)</td>
<td>-</td>
<td>-</td>
<td>Training</td>
</tr>
<tr>
<td>(17)</td>
<td>-</td>
<td>-</td>
<td>Role of the quality department</td>
</tr>
</tbody>
</table>

**Conclusion and drafting the Improved EFQM Model**

The findings of the Concept Mapping show that there is emphasis on customer, market, supplier and partnership and that the measurement system and results have a central position. Two underlying dimensions, stakeholder and process management, are identified and the distinction between enablers and results is confirmed.
Furthermore the five criteria Leadership, Policy and Strategy, Processes, Business Results and People Management proved to be essential in the concept map and in the award schemes world-wide.

A Design Team was asked to review these findings and make a proposal for the elements and structure of the improved EFQM Model. The continuity with the current EFQM Model should be clear and at the same time the dynamic in innovation should be part of the Improved EFQM Model.

The prototype for the Improved EFQM Model proposed has eleven criteria. There is a separation between Enabler and Result criteria. In the centre of the model is Process Management and on each side there are the stakeholders. On the enabler side People Management, Customer Focus, Partnership and Resource Management are located. On the result side People, Customer, Partner, and Society are located. Leadership and Strategy are merged. Organisational Results is the main criterion on the result side of the prototype. Furthermore, arrows are introduced. They symbolise the links between criteria, and stress the aspect of feedback and learning from the results. In other words Leadership and Strategy are related directly to Organisational Results and each Enabler has its specific Result criterion.

The prototype was presented to the Steering Group and discussed. There was critique concerning the merger of Leadership and Strategy. Therefore the criteria
Leadership and Strategy were separated again. At the same time the criteria Customer Focus and Process Management were merged to Customer Focused Processes. The addition of Partnership and Partner remained and Knowledge Management was introduced. Furthermore the central position of the measurement system was discussed. A method of measuring and reviewing abbreviated as RADAR was introduced as a separate part of the Improved EFQM Model. Emphasis was given to innovation and learning by arrows and by a dynamic oval shape of the Improved EFQM Model.

Djistal concluded in his study on the nomological network of quality management: “Theorising on the empirical structure of the framework, in other words, about the nomological network is scarce, if not totally absent”. However, this work shows that there are serious attempts to contribute to the theory and the model development. But the Improved EFQM Model Draft 1 is only the first step in the process of model development. The final goal is to create the EFQM Excellence Model. The next phase in the process is the testing of the proposed Improved EFQM Model. It is known that the test turned out to be negative. Therefore only some improvements were incorporated into the final EFQM Excellence Model. There will be a separate publication covering the testing of the Improved EFQM Model and the launch of the final EFQM Excellence Model.
Acknowledgements

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Literature


