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A causal model for employee satisfaction

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ABSTRACT *Employees are recognized as the most crucial asset of today's organizations by both academics and practitioners. The importance of employees is also reflected in the EFQM Excellence Model, since two of the criteria deal with employee-related issues (i.e. 'people' and 'people results'). The EFQM Excellence Model is by far the most widely used model for self-assessment in Europe, but there is no knowledge about the relationships between the enabler criteria and the most crucial of the results criteria: 'people results'. In this paper a frame of reference for employee satisfaction is constructed by comparing the EFQM Excellence Model and Hackman and Oldham's Work Design Model. This comparison has revealed a number of causal relationships between the enabler criteria and 'people results'. These causal relationships have been tested empirically through the Structural Equation Model and the results indicate that the enablers from the EFQM Excellence Model have a positive effect on the criterion 'people results'.*

Introduction

Employee involvement and satisfaction are stressed as two of the most important drivers of continuous improvement and satisfied customers in most classical total quality management (TQM) literature (Deming, 1986; Ishikawa, 1990; Juran, 1989). "A firm that manages to build quality into its employees is already half way toward the goal of making quality products", as Imai (1986) puts it.

This is supported by the research of Fukuda, which shows that productivity can be improved by raising the number of suggestions for improvement per employee per year, thus involving the employees in the quest for continuous improvement (Dahlgaard *et al.*, 1998).

Practitioners also recognize the importance of employee involvement. A survey conducted in 1992 among more than 1000 of *Human Resource Focus* readers showed that 46% rated employee involvement as one of their top three concerns for the future (Evans & Lindsay, 1996, p. 395). Other experiences from leading companies show that "they maintain a work environment conducive to the well-being and growth of all employees, and they measure employee" (Evans & Lindsay, 1996).

The importance of the employees has been stressed further with the move from TQM to business excellence. The cornerstones of business excellence are the '4 Ps' that a company must focus on in order to achieve excellence (Dahlgaard & Dahlgaard, 1999): people; partnerships; processes of work ; and products.

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This means that excellent employees together with excellent partners through excellent processes create excellent products. The drivers of excellence are thus the employees of the company.

Without satisfied and motivated employees it is impossible to produce world-class products and impossible to achieve satisfied and loyal customers. This is why 'people results' is included as a criterion in the EFQM Excellence Model.

The link between employee satisfaction and customer satisfaction has been verified empirically (Dahlgaard *et al.*, 1998, p. 355), but what is the connection from 'people results' to the enablers in the model? The EFQM Excellence Model is the most widely used model for self-assessment in Europe (Hakes, 1995, p. 26) but there is no knowledge about the relationships between the enabler criteria and the most crucial of the results criteria: 'people results'

These considerations suggest that there is a need for a model that links 'people results' to the enablers of the EFQM Excellence Model which management can use in order to increase the satisfaction of the employees, and thus the satisfaction of customers.

The aim of this paper is to create a frame of reference for employee satisfaction based on the EFQM Excellence Model and Hackman and Oldham's Work Design Model. This frame of reference will focus on identifying the causal relationships that create satisfied employees. One interesting aspect of this is to check whether the EFQM Excellence Model covers all the relevant aspects of Hackman and Oldham's Work Design Model.

After the frame of reference has been constructed it will be tested empirically through a survey among the managers of a large European service company. The data gathered through this survey will form the basis for verifying the postulated causal relationships through the use of the statistical technique called structural equation modelling (SEM). This test will show if the suggested causal model corresponds with the 'mental maps' of the managers, since it is based on the managers' evaluation of the statements. This will either lead to an acceptance of the model or a rejection with suggestion for improvement of the frame of reference.

Constructing the frame of reference

The purpose of this section is to construct a theoretical frame of reference for employee satisfaction based on criteria from the EFQM Excellence Model and the Work Design Model by Hackman and Oldham. The focus will be on not only the elements of employee satisfaction but also on the causal relationships between them.

The EFQM Excellence Model

The EFQM Excellence Model consists of nine criteria (EFQM, 1999) as shown in Fig. 1. In this model 'people results' is included as one of the four results criteria. The assumption behind the model is that "Excellent results with respect to Performance, Customers, People and Society are achieved through Leadership driving Policy & Strategy, People, Partnerships & Resources, and Processes" (EFQM, 1999).

There is, however, one flaw with the EFQM Excellence Model. It says nothing about the possible causal links between the enabler criteria and 'people results'. Without any knowledge about this causality the EFQM Excellence Model would not be very useful as a tool for understanding the dynamics of creating satisfied employees. The focus of the following will therefore be to examine the theory of Hackman and Oldham and argue for

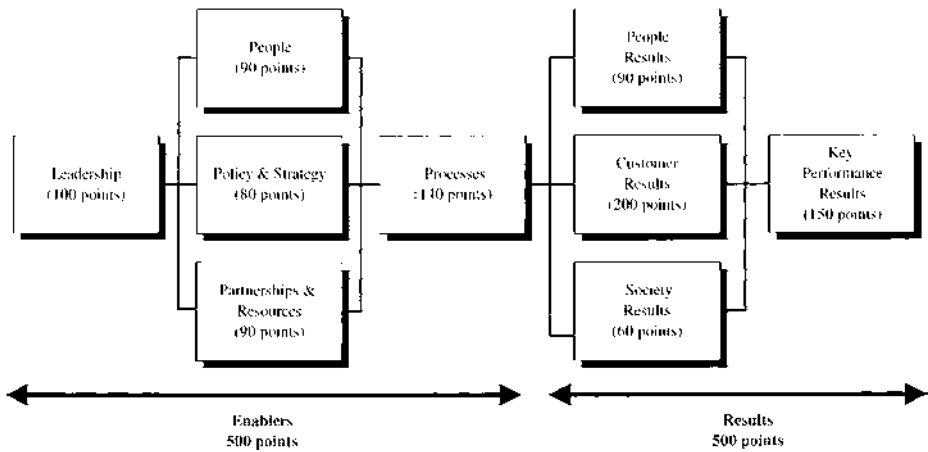


Figure 1. The EFQM Excellence Model

possible links between enabler criteria and 'people results' based on this theory and the contents of the EFQM Excellence Model.

Hackman and Oldham's Work Design Model

In an organization the processes must be designed to meet not only the technical demands of the organization but also the human/mental needs of the employees who work in it. Continuously improving processes will improve quality and thus productivity (Dahlgard *et al.*, 1998), but if processes are furthermore designed to fulfil the human/mental needs of the employees, morale and motivation will go up, leading to a further improvement of quality and productivity. This is the underlying principle behind Hackman and Oldham's Work Design Model (Evans & Lindsay, 1996) and the model incorporates both the technical and the mental elements of job design.

The Work Design Model, which is shown in Fig. 2, is a further development and an 'operationalization' of Herzberg's theory, and has been validated in many different organizational settings (Evans & Lindsay, 1996).

In this model, the outcomes are created by the three critical psychological stages that are influenced by the core job characteristics. Finally, there are some moderating variables that can have both a positive and a negative effect on the influence of the core job characteristics on the psychological stages and, finally, on the outcomes (Evans & Lindsay, 1996).

From the five core job characteristics it is clear that both the quality of work and employee satisfaction can be enhanced if the job design incorporates empowerment and involvement (task significance), process ownership (autonomy), job enlargement/rotation (skill variety and task identity) and feedback about performance (Dale *et al.*, 1997; Evans & Lindsay, 1996).

The Work Design Model by Hackman and Oldham makes some assumptions about the causal relationship between the core job characteristics, psychological stages and the outcomes, and these assumptions have been validated in many different organizational settings. In the following these assumptions will be used to determine the causal relationships between the elements included in the EFQM Excellence Model based on theoretical considerations.

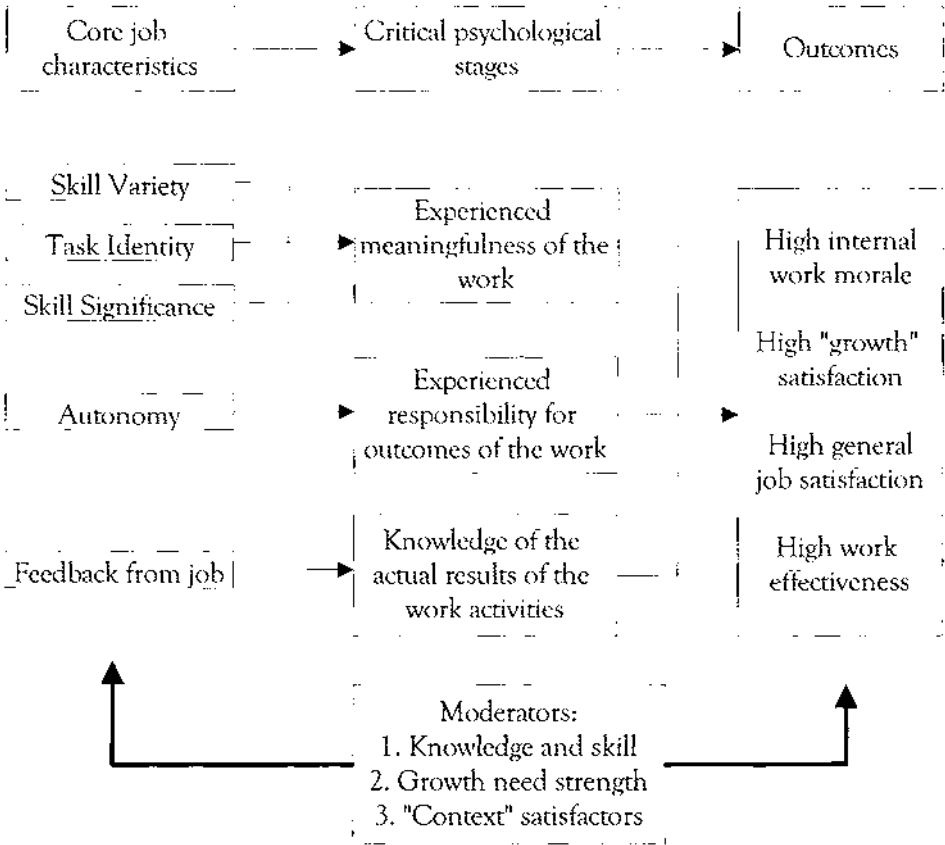


Figure 2. Hackman and Oldham

Causal relationships in the EFQM Excellence Model

There are two main differences between the Work Design Model by Hackman and Oldham and the EFQM Excellence Model.

The criteria from the enabler part of the EFQM Excellence Model cover far more than the elements included in the Work Design Model. This is especially true for the enabler criteria. Second, there are no suggested causal relationships in the EFQM Excellence Model such as in the Work Design Model.

The object is thus to identify where the elements of the Work Design Model are placed in the criteria from the EFQM Excellence Model and to establish the causal relationships between the criteria in relation to employee satisfaction based on the identification.

The outcome of the Work Design Model should in this context equal the 'people results' criterion of the EFQM Excellence Model. There are, however, some noteworthy differences between the two.

The first 'outcome' element in the Work Design Model, 'high internal work motivation', is covered by the criterion 'people results' but in a much more detailed manner. In the criterion the concept of motivation is operationalized through a number of indicators that could be included in the evaluation of motivation. The meaning of the concept is, however, the same in 'outcomes' and 'people results'. The 'outcome' elements, 'high growth satisfac-

tion' and 'high general job satisfaction', are covered in the same manner by the criterion 'people results'.

There is, however, one major conceptual difference between 'outcomes' and 'people results' and this relates to the last element in 'outcomes', namely: 'high work effectiveness'. This is not included in the 'people results' criterion but in 'key performance results', which means that 'high work effectiveness' is not a part of this frame of reference for employee satisfaction. On the other hand, 'people results' has a more 'enabler-like' character than 'outcomes' since it also includes things like the scope of the results.

With these differences in mind it does not seem far-fetched to conclude that the psychological stages from the Work Design Model will have an impact on the criterion 'people results' from the EFQM Excellence Model.

The first of the psychological stages, 'experienced meaningfulness of the work', concerns the employee's need for social acceptance and self-esteem. In order to fulfil these needs the company has to incorporate them into the human resource plans, indicating that there must be a link from the criterion 'people' to the criterion 'people results'. This link is also suggested in the official description of the EFQM Excellence Model (EFQM, 1999).

'People' includes the areas of empowerment, involvement and recognition that directly cover 'task significance', which is one of Hackman and Oldham's five core job characteristics. This criterion also concerns how the organization uses innovative organization methodologies such as job enlargement/rotation (EFQM, 1999), which have an impact on the core job characteristics: task identity and skills variety. Furthermore, this criterion also covers the moderating variables from the Work Design Model. It is through people that the organization can influence 'knowledge and skills', 'growth need strength' and the 'context satisfiers'.

There are, however, other criteria influencing the way in which the criterion 'people' addresses the three above-mentioned core job characteristics. First of all, the criterion includes the alignment of human resource plans with overall quality and operational performance plans, indicating that there must be a link from 'policy and strategy' to 'people'.

'Policy and strategy' is the criterion in which management sets the agenda for the future behaviour of the company and of course this must have an impact on people. Obviously, the behaviour of management has a large impact on the strategies and plans that the company develops (Whittington, 1993) regarding quality, performance and human resources. Remembering the definition of leadership as a process whereby an individual influences a group of individuals to achieve a common goal (Northhouse, 1997), this suggests that there should be a link from the criterion 'leadership' to both 'policy and strategy' and 'people'.

In other words, it is the behaviour of the organization's management and the manner in which they perform leadership that lays down the ground rules for the way that the core job characteristics will be addressed. This corresponds very well with the foundation metaphor of leadership from the EFQM Excellence Model.

The second psychological stage, 'experienced responsibility for outcomes of the work', from the Work Design Model is related to the employees' need for creative challenges and independence. This is, to a large extent, incorporated in the criterion 'processes', suggesting a link to 'people results'.

This is again influenced by two of the other enabler criteria. First of all, 'people' must have and impact on 'processes'. The human resource plans of the organization must reflect the desire for employee creativity and innovation as well as support the application of innovative organization methodologies (EFQM, 1999). This strongly supports this linkage. As mentioned earlier, there is a link from 'policy and strategy' to 'people' and from 'leadership' to both 'policy and strategy' and 'people'. These are also supported by this psychological stage.

Second, there is a need for resources if the organization is going to explore different

organizational structures and encourage creativity and innovation. Included in the criterion 'partnerships and resources' are areas such as how the organization identifies and evaluates alternative and emerging technologies and how the organization harnesses technology in support of improvement and develops and protects intellectual capital (EFQM, 1999). With respect to the core job characteristic 'autonomy', it is clear from these areas that the criterion 'partnerships and resources' must have an impact on the criterion 'processes'.

In the EFQM Excellence Model it is stressed that the resources should be allocated and managed in the light of the policies and strategies of the organization. This suggests a causal link from the criterion 'policy and strategy' to 'partnerships and resources'. Here it should be noted that 'policy and strategy' is highly influenced by 'leadership', as mentioned earlier. 'Partnerships and resources' is also highly influenced by the criterion 'leadership'. This is due to the fact that 'leadership' encompasses such things as funding learning and improvement activities (EFQM, 1999).

The third and last psychological stage from the Work Design Model by Hackman and Oldham is 'knowledge of the actual results of the work activities'. The core job characteristic associated with 'knowledge of the actual results of the work activities' is 'feedback from job'. This is covered in the criterion 'processes' from the EFQM Excellence Model. Here the organization must use performance and perception results to set agreed targets and relate the performance to those targets (EFQM, 1999). This supports the previously suggested link from 'processes' to 'people results'.

As with 'experienced responsibility for outcomes of the work', there are areas from the criteria 'people' and 'partnerships and resources' that have an impact on 'processes' when it comes to 'knowledge of the actual results of the work activities'.

Under the criterion 'people', the organization must deal with issues such as development of employees through work experience and on-the-job training, aligning individual and team objectives with targets, and sharing information as well as having a dialogue with the employees (EFQM, 1999). Clearly these areas have an impact on the core job characteristic 'feedback from job'. Here it is also important to remember the previously mentioned links from 'policy and strategy' to 'people' and from 'leadership' to both 'policy and strategy' and 'people'. These are also supported by 'knowledge of the actual results of the work activities'.

The impact from the criterion 'partnerships and resources' is due to areas such as how information and knowledge are managed, and how access to relevant information is provided for users (EFQM, 1999). These areas also have an impact on the core job characteristic 'feedback from job'. As mentioned earlier, there should be a link from the criterion 'policy and strategy' to 'partnerships and resources', since resources should be allocated and managed in the light of the policies and strategies of the organization. The criterion 'leadership' has an impact on both 'policy and strategy' and 'partnerships and resources' since the making of strategies and plans as well as providing appropriate resources are managerial responsibilities.

In relation to this psychological stage there is also a direct impact of 'policy and strategy' on 'processes'. This criterion concerns, among other things, how policies and strategies are cascaded down the organization, and how policies and strategies are based on information relating to the employees (stakeholders) and internal performance indicators, as well as benchmarks (EFQM, 1999). This information will be used to set objectives and prioritize plans throughout the organization, which means that the employees will be informed about the results of their efforts as well as the progress of improvement initiatives. This justifies the link from 'policy and strategy' to 'processes'.

The above assumptions regarding the causal relationships between the elements of the EFQM Excellence Model are illustrated in Fig. 3. Here, 'processes' and 'people' have a direct impact on 'people results'. 'Policy and strategy' and 'partnerships and resources' have an indirect impact on 'people results' and 'leadership' is the driver.

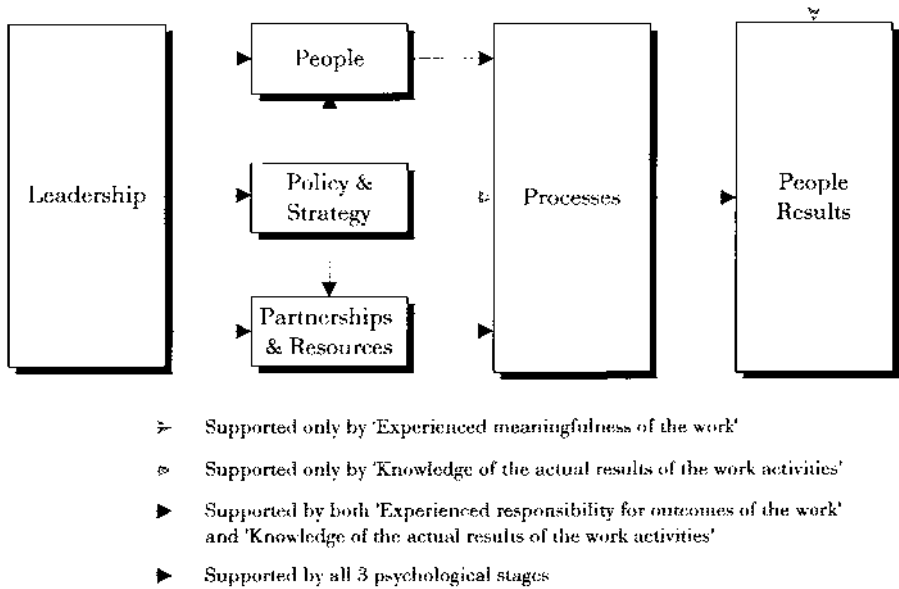


Figure 3. Theoretical causal relationships

Figure 3 also shows the number of psychological stages supporting each suggested link. The links from 'people' and 'policy and strategy' to 'people results' are only supported by one psychological stage. The links from 'leadership' to 'policy and strategy' and 'people' as well as the link from 'policy and strategy' to 'people' are supported by all psychological stages, whereas the rest of the suggested links are supported by two of the three psychological stages.

One interesting aspect of this model is the role of the criterion 'policy and strategy'. It is through this criterion that management's effort under 'leadership' sets the agenda for the future of the organization.

The above relationships between the elements in the EFQM Excellence Model are only based on theoretical considerations and the value of the model is very limited unless it is verified empirically. The focus of the next section is to test the model empirically through a questionnaire survey and the statistical technique called SEM.

Empirical test of causal relationships

In order to test the suggested causal relationships in Fig. 3, data from a questionnaire survey conducted in a major European service company with more than 10 000 employees will be used. The purpose of the survey was to provide the company with quantitative information as an input to their self-assessment process.

The questionnaire used in this survey was structured according to the criteria of the EFQM Excellence Model covering relevant aspects of each individual criterion (Eskildsen & Dahlgaard, 1998). The input to the development of this questionnaire has been EFQM material, previous attempts to construct questionnaires covering business excellence (Ahmadi & Helms, 1995; Conti, 1997; Hansen, 1997; Prescott, 1995) and focus group sessions in the European Company

Table 1. Latent and manifest variables

Latent variable	Manifest variable	Number of questions
Leadership	Leadership for employee involvement (LEI)	4
	Leadership for total quality (LTQ)	5
Policy and strategy	Hoshin planning process (HPP)	5
	Information gathering and analysis (IGA)	4
People	Human resource policies (HRP)	4
	Individual goals and competencies (IGC)	4
	Suggestion system (SUS)	4
Partnerships and resources	General resource policies (GRP)	5
	Objectives and standards (OAS)	3
Processes	Quality assurance (QAS)	4
	Benchmarking (BEM)	4
	Kaizen (KZN)	4
	Process management (PRM)	3
People results	Employee satisfaction results (ESR)	3
	Employee satisfaction activities (ESA)	8

More than 500 managers participated in the survey by stating their agreement to the 93 questions in the questionnaire. Internal reliability tests yielded nine uni-dimensional scales with Cronbach α 's between 0.769 and 0.88. Sixty-four out of these 93 statements will be used in this analysis since only the statements covering the six criteria included in the EFQM Excellence Model are relevant in this context. In this survey the return rate was approximately 80% and there was only approximately 1% missing values (Eskildsen & Dahlgaard, 1998). The high rate of response and the low rate of missing values along with the large number of respondents will make the conclusions drawn very reliable.

Using 64 manifest variables in SEM is very ambitious, so in this study it was decided to make a reduction in the data material. In order to do this a factor analysis was performed within each criterion and the identified constructs or factors were used to create new variables by summing the variables belonging to each individual construct/factor. The resulting 15 variables are shown in Table 1.

In this analysis there are two observed/manifest variables measuring each of the latent variables 'leadership', 'policy and strategy', 'partnerships and resources' and 'people results'. The latent variables 'people' and 'processes' are measured by three and four observed/manifest variables, respectively. Each of the observed/manifest variables consists of three to eight questions from the questionnaire and the names of the variables show the area that the questions cover. In order to ease the interpretation of coefficients the observed/manifest variables have been standardized so that their range is from 0 to 100.

The fundamental hypothesis of SEM is that the covariance matrix of the observed manifest variables is a function of a set of parameters which in this case means relationships between the latent variables and between the latent and the observed manifest variables (Bollen, 1989). If the constructed model is correct the population covariance matrix will be exactly reproduced. In practice, neither the population covariance matrix nor the parameters are known so the task is to form estimates of the unknown parameters based on the sample covariance matrix (Bollen, 1989).

The Structural Equation Model used to analyse the covariance structure in the data and thereby estimate the relationships consists of two parts (Bollen, 1989). The first part of the model consists of the structural equation for the latent variable model:

$$\eta = \mathbf{B}\eta + \Gamma\xi + \zeta \quad (1)$$

Here η is an $m \times 1$ vector of the latent endogenous variables and \mathbf{B} is an $m \times m$ coefficient matrix for the latent endogenous variables (Bollen, 1989). The latent endogenous variables in this context are 'policy and strategy', 'partnerships and resources', 'people', 'processes' and 'people results'. In the structural equation ξ is an $n \times 1$ vector of the latent exogenous variables and Γ is an $m \times n$ coefficient matrix for the latent exogenous variables (Bollen, 1989). In this context there is only one latent exogenous variable, and that is 'leadership'. Finally, an error term, ζ , is included in the model which is an $m \times 1$ vector (Bollen, 1989).

The structural equation for the latent variable model is based on a number of assumptions. First of all the expected values of η , ξ and ζ are all assumed to be zero. Second, the exogenous variables, ξ , are assumed uncorrelated with the error term, ζ ; $(\mathbf{I} - \mathbf{B})$ must be non-singular and, finally, the error term is assumed to be homoscedastic as well as non-autocorrelated (Bollen, 1989).

The second part of the Structural Equation Model consists of the structural equations for the measurement model (Bollen, 1989):

$$\begin{aligned} \mathbf{x} &= \Lambda_{\mathbf{x}}\xi + \delta \\ \mathbf{y} &= \Lambda_{\mathbf{y}}\eta + \varepsilon \end{aligned} \quad (2)$$

In this model \mathbf{y} is a $p \times 1$ vector of the observed indicators of η (the latent endogenous variables) and \mathbf{x} is a $q \times 1$ vector of the observed indicators of ξ (the latent exogenous variables) (Bollen, 1989). In this context there are 13 indicators of η and two indicators of ξ . $\Lambda_{\mathbf{y}}$ and $\Lambda_{\mathbf{x}}$ are matrices that contain the λ_i coefficients which links the latent and the manifest variables together. The dimension of $\Lambda_{\mathbf{y}}$ is $p \times m$ and the dimension of $\Lambda_{\mathbf{x}}$ is $q \times n$ (Bollen, 1989). The λ_i s denote the expected change in the observed variables associated with a one unit change in the latent variables.

There are two error terms in these equations; they are denoted by δ and ε and they are the error of measurement for \mathbf{x} and \mathbf{y} , respectively, and have the same dimensions as \mathbf{x} and \mathbf{y} , respectively (Bollen, 1989).

There is also a number of assumptions associated with structural equations for the measurement model (Bollen, 1989). The expected values of η , ξ , δ and ε are all assumed to be zero; the error terms, δ and ε , are assumed uncorrelated with η and ξ as well as with each other. Finally, δ and ε are assumed homoscedastic and non-autocorrelated, as was the case for ζ in the structural equation for the latent variable model (Bollen, 1989).

The method of estimation was in this case maximum likelihood (ML). The fit-function, F_{ML} , that is minimized is in this case given by (Bollen, 1989):

$$F_{\text{ML}} = \log |\Sigma(\theta)| + \text{tr}(\mathbf{S}\Sigma^{-1}(\theta)) - \log |\mathbf{S}| - (p - q) \quad (3)$$

In this analysis there are 15 manifest variables and six latent variables and they are all shown in Table 1. The structural relationships of interest among the latent variables are the theoretical causal relationships shown in Fig. 3.

The statistical software used in the analysis of the above-mentioned relationships was LISREL. The initial model from Fig. 3 was estimated through a number of sub-steps where relationships were added from step to step in order to see if they made sense. In the course of this process the modification index from LISREL was used to look for improvements in the model.

The modification index exists for each fixed parameter in the model or in other words every link that has not been specified (Jöreskog & Sörbom, 1993). The index is an estimate/prediction of the improvement in the model fit due to setting the parameter free.

The modification indices should, however, be used with caution. A parameter/link should only be relaxed if it can be interpreted substantively (Jöreskog & Sörbom, 1993), regarding both the direction of impact as well as the sign of the parameter. In this case the modification indices suggested that the following link should be added to the structural equation model.

The manifest variable '*kaizen*' (KZN) should not only be explained by the latent variable 'processes' but also by 'people'. KZN includes such things as motivating employees to make suggestions for improvements, motivating employees to be innovative, giving adequate training when process changes are made and involving everybody affected by process changes. This is very much included in 'people', so this link makes sense and has been included in the model.

Second, the manifest variable 'individual goals and competencies' (IGC) should not only be explained by the latent variable 'people' but also by 'policy and strategy'. IGC includes such things as establishing objectives in co-operation with the employees, evaluating the efforts made by employees in relation to the jointly established objectives, evaluating the skills of the employees and composing an education plan in co-operation with every single employee. This is very much in line with the contents of 'policy and strategy', so this link makes sense and has been included in the model.

Finally, the modification indices suggested that some of the constraints on the error terms for the manifest variables should be relaxed in order to get a better fit of the model. Three of these indices made sense and would improve the overall fit a great deal. The first pair of manifest variables which error terms should be allowed to correlate was 'leadership for total quality' (LTQ) and 'information gathering and analysis' (IGA).

LTQ concerns the way in which top management shows their commitment to TQM and especially how top management spends time improving the relationship with the organization's customers. IGA concerns how the collection and use of information on the organization's customers—and their satisfaction—is the basis for determining the organization's objectives and strategies. It is clear that these two manifest variables are related and therefore their error terms are allowed to correlate. The sign should be positive, however, and that is also the case.

The second pair of manifest variables that the modification indices suggest should be allowed to correlate was 'leadership for total quality' (LTQ) and 'suggestion system' (SUS). LTQ also includes that top management should encourage the employees to make suggestions for improving the routines in the organization. SUS concerns how this commitment from top management is reflected in the people management of the organization in terms of encouragement of employees to make suggestions for how their daily work/routines can be improved, as well as suggestions for the solution of quality problems. Obviously, these variables must be positively related and this is also the case, therefore the constraint has been relaxed.

The third and last situation in which the correlated error terms made sense was between the manifest variables 'objectives and standards' (OAS) and KZN. OAS concerns to what degree the organization has written objectives and standards for the ways financial as well as other resources are managed. KZN, on the other hand, embraces such things as motivation of employees to be innovative and suggesting process improvements as well as giving adequate training when process changes are initiated. These concepts might create a conflict of interest in the organization, since a heavy dependency on tight resource management might have a negative impact on the attempt to achieve continuous improvements in the organization. Therefore, the sign on this parameter must be negative, and since this is the case the constraint has been relaxed.

Table 2 shows the goodness of fit measures for the complete causal model. It is

Table 2. *Goodness of fit statistics for causal model*

GFI	0.96
AGFI	0.93
NFI	0.95
IFI	0.97
RFI	0.93
NNFI	0.96
RMSEA	0.051

recommended to use a variety of different fit statistics since they all compute different things (Bollen & Long, 1993).

The goodness of fit index (GFI) measures the relative amount of variance and covariance explained in **S** and should be as close to unity as possible (Bollen, 1989). The same is true for AGFI, which is an adjustment of GFI for the degrees of freedom. Both of these measures are close to unity and thus suggest a pretty good fit.

The NFI, NNFI, IFI and RFI all compare the estimated model with the independence model (Bollen, 1989). NFI is dependent upon the sample size and the degrees of freedom, while IFI should be less dependent upon them. RFI corrects for degrees of freedom by measuring fit per degree of freedom, while NNFI also tries to correct for sample size effect. These measures should also be close to unity, and this is also the case in this analysis, indicating a good overall fit.

The last goodness of fit measure used in this analysis is the root mean squared error of approximation (RMSEA). This measure expresses the discrepancy per degree of freedom for the model (Browne & Ruddeck in Bollen & Long, 1993). A value of 0.05 or less indicates a close fit but a value of 0.1 or less will indicate a reasonable error of approximation. RMSEA is in this case 0.051, indicating a close fit of the model, although an analysis of the standardized residuals only supports a moderate fit since they indicate a departure from normality.

A good overall fit is, however, useless if the analysis yields nonsense results for individual parameters. The coefficients for the individual parameters as well as their squared multiple correlation R^2 are shown in Table 3.

All the coefficients for paths from the latent variables to the manifest variables are positive, as indeed they should be. Most of the R^2 s are moderate to large, except for IGA, OAS and ESR, which are not so well accounted for.

All the coefficients leading from one latent variable to another are positive, as they should be, and the R^2 s are all moderate to large, indicating a satisfactory fit for all these components.

Finally, the error covariance between KZN and OAS is negative and the error covariances between LTQ and IGA and between LTQ and SUS are both positive, as previously anticipated.

The component fit measures have not shown any obvious misspecifications, and since virtually all the overall fit measures are favourable, the model appears to be a good match to the data. The conclusion from this empirical analysis is thus that the 'mental maps' of those managers who participated in the survey support the suggested causal relationships in the EFQM Excellence Model.

Conclusion

The aim of this paper was to create a frame of reference for employee satisfaction. Since the EFQM Excellence Model says nothing about the causal relationships between the criteria it

Table 3. Coefficients of determination

Variable	Coefficients	R ²
Policy and strategy	0.74*Leadership	0,55
People	0.49*Leadership + 0.50*Policy and strategy	0,86
Partnerships and resources	0.29*Leadership + 0.54*Policy and strategy	0,61
Processes	0.23*Policy and strategy + 0.23*People + 0.42*Partnerships and resources	0,65
People results	0.34*People + 0.44*Processes	0,52
LEI	13.55*Leadership	0,59
LTQ	12.11*Leadership	0,50
HPP	13.76*Policy and strategy	0,64
IGA	8.88*Policy and strategy	0,26
HRP	13.16*People	0,66
IGC	5.06*People + 10.16*Policy and strategy	0,42
SUS	14.66*People	0,59
GRP	14.13*Partnerships and resources	0,71
OAS	9.94*Partnerships and resources	0,30
QAS	13.80*Processes	0,63
BEM	13.70*Processes	0,55
KZN	10.41*People + 5.76*Processes	0,59
PRM	12.46*Processes	0,41
ESR	8.86*People results	0,24
ESA	15.40*People results	0,73
Error covariance for KZN and OAS		-38,73
Error covariance for LTQ and IGA		64,91
Error covariance for LTQ and SUS		38,82

was compared with the Work Design Model by Hackman and Oldham, and the similarities between the two frameworks formed the basis for a theoretical argumentation for possible causal relationships.

One aspect of this comparison was to check whether the criteria from the EFQM Excellence Model covered all the relevant aspects of Hackman and Oldham’s Work Design Model. This was found to be the case, except for ‘high work effectiveness’. This is not included in the ‘people results’ criterion but in ‘key performance results’. ‘High work effectiveness’ is therefore not a part of this frame of reference for employee satisfaction, but it suggests that there is a relationship between the EFQM Excellence Model and the performance of a given organization.

After the causal relationships of the EFQM Excellence Model were uncovered they were tested empirically through a survey among the managers of a large European service company. The data from this survey formed the basis for testing the causal relationships through the use of the statistical technique called SEM.

This test showed that the theoretical argumentation for causal relationships is supported by the empirical data. This implies that an organization can improve the employees’ satisfaction by focusing on improving the performance within the five enabler criteria.

The resulting causal relationships in the EFQM Excellence Model are shown in Fig. 4. This figure shows that the suggested causal relationships correspond with the ‘mental maps’ of the managers from the large European company since it is based on the managers’ evaluation of the statements. This is also a weakness of the study since the conclusion is based on the assumption that the managers’ perception is a valid measure of the individual statements.

The limitations of these results are also that they are based solely on data from one

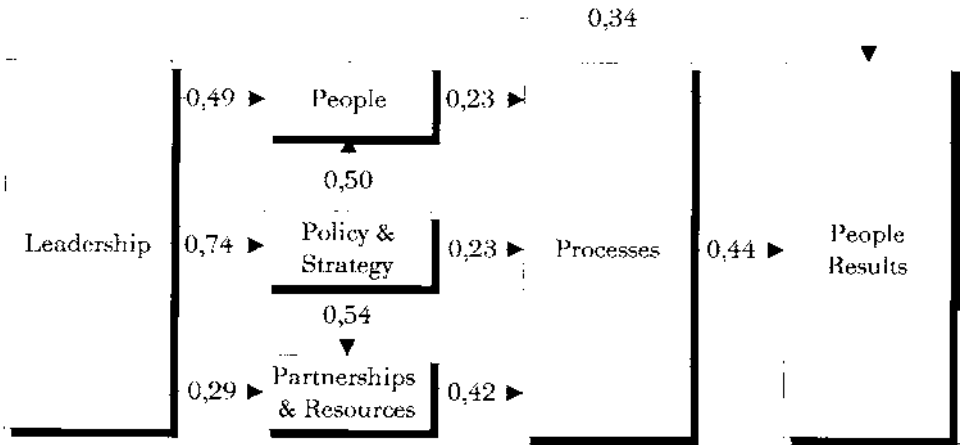


Figure 4. Empirical causal relationship

company. The focus of future research will therefore be to collect data from other organizations in order to validate the results from this study. Without such a replication, the results will not have a general applicability.

Furthermore, it will be the focus of future research to link the EFQM Excellence Model to the remaining result criteria from the EFQM Excellence Model. The analysis of Hackman and Oldham's Work Design Model discovered that there might be a linkage between the EFQM Excellence Model and the criterion 'key performance results', and if this is the case there should also be a linkage to 'customer results' and to 'society results'.

Finally, future research will focus on the use of the results in self-assessment. Knowing the causal structure of the model will enable an organization to exploit fully the benefits of Conti's right/left approach to self-assessment (Conti, 1997).

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