

Exploring differences between private and public organizations in business excellence models

Private and
public
organizations

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Hendry Raharjo and Henrik Eriksson
*Division of Service Management and Logistics,
Department of Technology Management and Economics,
Chalmers University of Technology, Gothenburg, Sweden*

Received 29 September 2015
Revised 7 March 2016
6 June 2016
28 September 2016
3 April 2017
Accepted 5 April 2017

Abstract

Purpose – The purpose of this paper is to explore the differences between public and private organizations in the paths of business excellence models and to identify the key drivers for creating business results and customer satisfaction.

Design/methodology/approach – The partial least squares structural equation modeling technique is used to compare the path coefficients and to identify the key driver constructs for creating business results.

Findings – The variation in endogenous constructs is found to be more difficult to explain or predict for private organizations than for public organizations, despite the fact that the performance of private organizations is almost always higher than or equal to the performance of public ones in all criteria. The effect of “leadership” on “management of processes” is significantly higher in public organizations than in private ones. However, “management of processes” in public organizations does not seem to translate into “results.” The effect of “strategic planning” on creating business “results” is negative for public organizations and remains inconclusive, due to insufficient evidence, for private organizations.

Research limitations/implications – The results may not be generally applicable to other countries. However, they do support the move toward more tailor-made models for specific sectors.

Practical implications – It is necessary to review the national business excellence model in order to fit specific sectors.

Originality/value – This is the first study to investigate the differences between private and public organizations in the Swedish business excellence model.

Keywords Multi-group analysis, Quality management, Importance-performance analysis, Business excellence, Private organization, Public organization, Quality award

Paper type Research paper

1. Introduction

Sousa and Voss (2002) argued that research on quality management (QM) needs to understand the application of QM in different industries; in other words, more contingency research is needed. The use of management models that come from private sectors (e.g. QM) in public organizations has faced extensive criticism. Although public and private organizations have many similarities, there are also differences; for example, concerning the source of financial resources, ownership, and model of social control (Perry and Rainey, 1988; Hvidman and Andersen, 2014). Boyne (2002, p. 97) analyzed the differences between public and private organizations in terms of how they are run and concluded that the only differences were that “public organizations are more bureaucratic, and public managers are less materialistic and have weaker organizational commitment than their private sector counterparts.”

The connection between the theory and practice of QM and business excellence models has been well documented. Several studies have confirmed that excellence models constitute the essence of QM (Ghobadian and Woo, 1994; Hendricks and Singhal, 1997; Tan *et al.*, 2003) and are based on the principles and practices of successful organizations. The successful

The authors gratefully acknowledge critical feedback from two anonymous reviewers and the support from the Swedish Institute for Quality (SIQ) in providing its resources, past data, and partial funding to carry out this research.



International Journal of Operations
& Production Management
Vol. 37 No. 12, 2017
pp. 1795-1816
© Emerald Publishing Limited
0144-3577
DOI 10.1108/IJOPM-09-2015-0593

implementation of QM has also been shown to have a positive impact on performance (see Eriksson and Hansson, 2003; Boulter *et al.*, 2013). Excellence models generally consist of a number of criteria that represent various important areas of an organization. Most studies of relations between different criteria in excellence models have either looked at private organizations (Samson and Terziovski, 1999; Curkovic *et al.*, 2000; Calvo-Mora *et al.*, 2013, 2014) or have not explained in detail the type of organizations in the data analyses; for example, see Jayamaha *et al.* (2009) or Heras-Saizarbitoria *et al.* (2012).

Considering the need for contingency research (Sousa and Voss, 2002; Escrig and de Menezes, 2016) and the lack of literature regarding the application of business excellence models in a specific sector, we aim to explore the differences between public and private organizations in the paths of business excellence models and to identify the key drivers for creating business results and customer satisfaction. This should be useful from a practical perspective. We have worked together with the Swedish Institute for Quality (SIQ), which adopted and adapted the Malcolm Baldrige National Quality Award (MBNQA) model to the local context in Sweden. The SIQ's business excellence model, as shown in Figure 1, has been used since 1992 and consists of seven main criteria and 25 sub-criteria. The main criteria are leadership, information and analysis, strategic planning, human resource development, management of processes, results, and customer satisfaction. This research was conducted using the applicants' score data of all private and public organizations that applied for the Swedish quality award using the SIQ model from 1992 to 2014 ($n = 165$).

The remainder of this paper is organized as follows. In Section 2, we describe the theoretical basis and formulation of the research hypotheses. In Section 3, we explain the research methodology. The findings from the data analysis are presented in Section 4, before Section 5 discusses the findings in the light of the theoretical background. Section 6 concludes the paper.

2. Literature review and research hypotheses

2.1 Validity of the business excellence models

Curkovic *et al.* (2000) was one of the first studies to use structural equation modeling (SEM) to investigate the validity of the paths and relationships between criteria in excellence models. They concluded that the MBNQA framework captures the concept of total quality management (TQM). Similarly, Bou-Llusar *et al.* (2009) studied whether the excellence models capture the essence of TQM. They studied the excellence model of the European Foundation for Quality Management (EFQM) in a survey of managers in Spanish companies and concluded that the EFQM enablers do indeed capture TQM. Furthermore, Heras-Saizarbitoria *et al.* (2012) found that the relationships between the criteria in the EFQM model are robust. Based on studies of business excellence models (New Zealand, Australia, and Singapore),

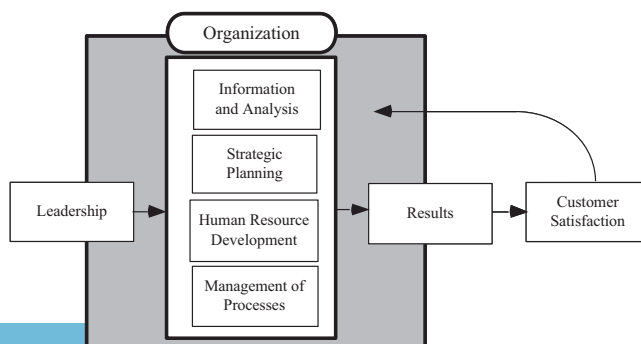


Figure 1.
The SIQ business excellence model for performance excellence (SIQ, 2015)

Jayamaha *et al.* (2009) stated that the models are valid because they all pass the minimum requirement for measurement validity. There have also been a number of studies of how different excellence criteria relate to one another; many of these have used surveys to capture data (Samson and Terziovski, 1999; Curkovic *et al.*, 2000; Lee *et al.*, 2003; Su *et al.*, 2003; Moon *et al.*, 2011), while some more recent studies have also used actual application scores from organizations (Heras-Saizarbitoria *et al.*, 2012; Calvo-Mora *et al.*, 2014).

Much important work with respect to investigating the different relationships between the criteria in excellence models has already been performed. Specifically, it is difficult to argue against the leadership effect on strategy. Research articles about excellence models have also pointed out this relationship (Jayamaha *et al.*, 2008; Heras-Saizarbitoria *et al.*, 2012). It is also difficult to question the positive effect of leadership on human resources. Studies of this relationship and in the context of excellence models can be seen in Gómez-Gómez *et al.* (2011) and Heras-Saizarbitoria *et al.* (2012). The leadership effect on results has been studied empirically (Moon *et al.*, 2011). Based on a survey of South Korean organizations, Moon *et al.* (2011) found support for many of their hypotheses, including the leadership effect on information and analysis, strategic planning, human resource focus, and process management. Su *et al.*'s (2003) SEM study of Taiwanese firms and the quality award in Taiwan found that leadership is the driver of the system that creates the results. In particular, they found that leadership influences information management and that information management also impacts the other categories in the Taiwanese award model. Leadership and strategic management also influence the results in Su *et al.* (2003).

Xiang *et al.*'s (2010) study of the Chinese quality award and analysis of the causal relationships among the criteria found that, in both Chinese service and manufacturing companies, leadership affects the other criteria in the model. Meyer and Collier (2001) used confirmatory SEM to study causal relationships in MBNQA healthcare criteria. They assessed data from 220 US hospitals and, like many other manufacturing studies, found that leadership is the driver of other criteria (information and analysis, strategic planning, human resource development, process management, and organizational results). Information had a significant effect on organizational result (labeled performance), human resources had a significant effect on results, and both process management and results had a positive effect on the customer criteria.

Also, there have been many studies of excellence models and how certain criteria affect the performance and results; for example, see recent articles by Calvo-Mora *et al.* (2014) and Sabella *et al.* (2014). Calvo-Mora *et al.* (2014) investigated the EFQM model and stated that results are affected by the criteria of management of human resources, the strategic management of partnerships and resources, and process management. With regard to the MBNQA model, Sabella *et al.* (2014) argued that people management, process management, and information and analysis all affect performance. The effect of process management on results has been well documented (Curkovic *et al.*, 2000; Fotopoulos and Psomas, 2010; Calvo-Mora *et al.*, 2014). Samson and Terziovski (1999) showed early on that the relationship between TQM practice and organizational performance is significant and that TQM practice explains the variation in operational performance. More specifically, they stated that leadership, management of people, and a customer focus have the strongest impact on operational performance. Calvo-Mora *et al.* (2014) concluded that the technical factors of TQM act as a mediating variable between social TQM and results.

In summary, many articles have explained the validity and the paths between different criteria in excellence models. Most of these studies have looked at data from private organizations; for example, Samson and Terziovski (1999), Curkovic *et al.* (2000), Lee *et al.* (2003), Moon *et al.* (2011), and Calvo-Mora *et al.* (2014). However, it is difficult to argue that the business excellence models are not valid for public organizations since the models are generic in nature. Research into the use of business excellence models in public organizations

generally remains limited. We found three studies on the application of business excellence models in public organizations: Eskildsen *et al.* (2004), Gómez-Gómez *et al.* (2011), and Raharjo *et al.* (2015). Interestingly, despite some differences between the two sectors, most of the findings of these studies do not contradict the results reported in the private organizations regarding whether the paths proposed in the excellence models are statistically significant. Therefore, there is evidence that most of the paths, as formulated in the excellence model, exist empirically (non-zero) in public organizations.

Eriksson *et al.* (2016, p. 14) stated that “there were surprisingly few differences in the challenges foreseen by different types of organizations.” Respondents from their Delphi study foresaw the same challenges related to QM, regardless of whether they came from a private or a public organization. As part of our quest to find out more about the validity of excellence models for each sector, we have formulated the following two hypotheses:

- H1. The paths in the excellence models have statistical significance for private organizations.
- H2. The paths in the excellence models have statistical significance for public organizations.

By having statistical significance, we mean that the existence of the path is empirically supported by the data (i.e. a non-zero relationship).

2.2 Differences between private and public organizations in business excellence models

While several studies have reported on the differences between the private and public organizations, less attention has been devoted to how the two types of organizations differ when it comes to using business excellence models. However, a lot of important work has been presented regarding the differences between public and private organizations. An early theory of public-private distinction (Rainey *et al.*, 1976), which is rooted in public administration, claimed that there are significant differences between the two sectors in terms of: their purposes, objectives, and planning; their selection, management, and motivation; and controlling and measuring results. Hansen and Villadsen (2010) showed that public managers in Denmark use more participative leadership, whereas private ones use more directive leadership. Along the same lines, Andersen (2010) found that public and private managers in Sweden differ significantly in terms of their leadership style and motivation profile. The public managers in his study had a more change-oriented leadership style (e.g. pushing for growth, initiating new projects, offering ideas about new and different ways of doing things, giving thoughts and plans for the future), whereas the private managers had a more relationship leadership style (e.g. being considerate and friendly and allowing subordinates to make decisions). Furthermore, Eskildsen *et al.* (2004) found that private and public organizations do not achieve excellent results in the same way. Specifically, private companies place higher emphasis on the system dimension, whereas public organizations place greater emphasis on the people dimension. Hence, the leadership effect on the other part of the organizational system (information and analysis, strategic planning, human resource development, and management of processes) should be stronger in public organizations than in their private counterparts. This is due to the fact that participatory and change-oriented leadership style is promoted in the excellence models (SIQ, 2015), and this type of leadership is generally more visible in public organizations.

Furthermore, Dixit (1997) studied the power of incentive in private vs public organizations and stated that government agencies and public enterprises are generally thought to perform poorly because the managers and workers lack high-powered incentives compared to private firms. Dixit (1997) also argued that government agencies must operate within a framework of politics. Public organizations do not generally focus on profit

maximization and have to report to several stakeholders (Boland and Fowler, 2000). Using quantitative research, Boyne (2002) showed statistically that public management is characterized by more bureaucracy, a stronger desire to promote public welfare, and lower organizational commitment than private management. Lyons *et al.* (2006) also found that public sector employees displayed lower levels of organizational commitment than private sector employees. In the context of Swedish private and public organizations, Elg *et al.* (2017) stated four key arguments that distinguish private and public services: rights and access, equality, coerciveness, and legitimacy. The core values of public organizations are primarily influenced by legislation, publicity in the society, and politics, as opposed to profit maximization in their private counterparts. Moreover, Gómez-Gómez *et al.* (2011) applied partial least squares (PLS) with limited numbers of organizations, and also separated public ($n = 25$) and private organizations ($n = 43$) in their analysis. Their results showed that there are significant differences between the two groups and that manufacturing/private companies provide a better fit to the EFQM model than public/educational organizations. We extend this line of research using a different business excellence model (MBNQA-based) and context with more extended analyses and a larger sample size. We also consider various types of public organizations, including educational organizations.

Eriksson (2016) recently concluded that private organizations outperform public organizations when it comes to QM practices, and especially with regard to process management, which appears to be easier for private firms. An earlier study by Dean and Helm (1996) also showed that private organizations are ahead of public organizations when it comes to QM practices. Hence, due to the better fit of excellence models to private organizations, and the lack of incentives and high bureaucracy in public organizations, which makes it more difficult to generate results, we argue that the effect of the organizational system (information and analysis, strategic planning, human resource development, and management of processes) on results and customer satisfaction should be stronger in private organizations than in public ones.

Therefore, we conclude that private and public organizations are different and that differences in the paths should be evident. We summarize the differences in the following hypotheses:

- H3.* The paths of the excellence models are statistically different between private and public organizations.
- H3a.* Leadership effect on information and analysis, strategic planning, human resource development, and management of processes is positively stronger for public organizations than for private ones.
- H3b.* The effect of information and analysis, strategic planning, human resource development, and management of processes on results and customer satisfaction is positively stronger for private organizations than for public ones.

3. Research method

The data were extracted from the SIQ database. There were a total of 165 applicants between 1992 and 2014. For data analysis, we used the PLS-SEM method (Hair *et al.*, 2012; Sarstedt *et al.*, 2014). We chose this method because we were interested in the relationship between the independent and dependent constructs in the SIQ model, especially in terms of how well the independent constructs can predict the dependent ones. Had we been interested in testing model fit, we would have used the covariance-based SEM method (Bollen, 1989). The PLS-SEM approach also enabled us to test the paths' difference between the two groups and to identify key driver constructs for predicting endogenous constructs; in this case, business results and customer satisfaction.

We used the PLS multi-group analysis (MGA) (Henseler *et al.*, 2009; Sarstedt *et al.*, 2011) to compare the path coefficients between the two types of organizations, and used the importance-performance matrix analysis (IPMA) to map the key driver constructs' total effects (importance) and average scores (performance) on a target construct (see Rigdon *et al.*, 2011; Hair *et al.*, 2014; Schloderer *et al.*, 2014). The software SmartPLS version 3.2.1 was used for model estimation (Ringle *et al.*, 2015).

We used reflective measurement for the PLS model because the measure variables (sub-criteria) are supposedly affected by the same underlying latent variable (main criteria). In other words, the main criteria – such as leadership, which is a theoretical concept – are measured by a number of aspects. Furthermore, the measure variables are highly correlated and internally consistent among themselves (Chin, 1998). Note that incorrect choice of measurement model may lead to deflation or inflation of the path coefficients and the R^2 values (Roy *et al.*, 2012).

The applicants' scores data in all sub-criteria are provided by an impartial group of examiners who are trained by SIQ. These scores data are in the form of percentages. Considering the fact that the sub-criteria and their weights have been re-organized several times over the years, we transformed those scores (i.e. percentages) into points before conducting further analyses. For example, the main criterion "leadership," out of 1,000 points, had a weighting of 90 points from 1992 to 1998, 120 points from 1999 to 2003, and 150 points from 2004 to 2014. Suppose that an organization receives 50 percent in 1992 and 50 percent again in 2014, then their transformed values in the form of points, which are 45 points (50 percent of 90) and 75 points (50 percent of 150), respectively, are used for the data analysis. The maximum point that each applicant can have (i.e. 1,000 points) and the seven main criteria have remained the same for all years.

The latest configurations for point allocation to the sub-criteria are provided in Table I. The three following mergers were used for the sub-criteria:

- (1) Sub-criterion 1.3 ("leadership for processes") is merged with sub-criterion 1.2 ("leadership for continuous improvement") and coded as "L2_3" because "leadership for processes" only existed from 2004.
- (2) Sub-criterion 4.3 ("employee involvement and participation") is merged with sub-criterion 4.6 ("results – employee involvement and development") and coded as "HRD3_6" because sub-criterion 4.6 only existed from 1996.
- (3) Sub-criteria 5.1 ("control of processes") and 5.2 ("improvement of processes") are combined, coded as "MP1_2," for two reasons: they existed from 2004; and they were measured by other dimensions before 2004, such as "main processes," "supporting processes," and "development of processes, goods and services."

The SIQ model has, in fact, not been tested for measurement validity before. We therefore start our data analysis with testing its measurement validity using the entire data set assuming that the general model can be applied for both private and public, virtually all, organizations in Sweden.

4. Results

4.1 Current SIQ model assessment

The current configuration of SIQ model was assessed using all data ($n = 165$). Unfortunately, it did not meet the discriminant validity for both Fornell-Larcker and heterotrait-monotrait (HTMT) criteria (Henseler *et al.*, 2015). In particular, the HTMT-inference – the most liberal criterion, with 5,000 samples (significance level = 0.05) – was used considering the close relationships among the constructs and indicators.

Table I.
SIQ main and sub-criteria (SIQ, 2015)

Main criteria	Sub-criteria	Points	Code
Leadership (150 points)	1.1 Top management	45	L1
	1.2 Leadership for continuous improvement	30	L2_3
	1.3 Leadership for processes	30	L2_3
	1.4 Community involvement	15	L4
	1.5 Environmental management	30	L5
Information and analysis (70 points)	2.1 Management and use of information	45	IA1
	2.2 Information on leading organizations and competitors	25	IA2
Strategic planning (50 points)	3.1 Organizational planning	50	SP1
	4.1 Strategic competence development	25	HRD1
Human resource development (150 points)	4.2 Individual competence development	25	HRD2
	4.3 Employee involvement and participation	35	HRD3_6
	4.4 Recognition and encouragement	20	HRD4
	4.5 Work environment and job satisfaction	20	HRD5
	4.6 Results – employee involvement and development	25	HRD3_6
Management of processes (120 points)	5.1 Control of processes	60	MP1_2
	5.2 Improvement of processes	40	MP1_2
	5.3 Collaboration with suppliers and partners	20	MP3
Results (160 points)	6.1 Results – processes	100	R1
	6.2 Results – collaboration with suppliers and partners	20	R2
	6.3 Results – community involvement and environmental management	40	R3
Customer satisfaction (300 points)	7.1 Customer expectations	50	CS1
	7.2 Collaboration with customers	45	CS2
	7.3 Commitments to customers	25	CS3
	7.4 Measurement of customer satisfaction	60	CS4
	7.5 Results – customer satisfaction	120	CS5

Table II shows the discriminant validity assessment results using Fornell-Larcker criteria. It can be seen that the “human resource development” construct is highly correlated with “customer satisfaction” (0.852). This correlation should fall below the square root of the average variance extracted (AVE) value, which is on the diagonal (0.841). Table III shows the HTMT results sorted by the bias-corrected upper confidence limit. The upper confidence limit values of the HTMT ratio for the first two construct relationships (information and

Fornell-Larcker criterion ^a	Customer satisfaction	Human resource development	Information and analysis	Leadership	Management of processes	Results	Strategic planning
Customer satisfaction	0.841						
Human resource development	0.852	0.881					
Information and analysis	0.828	0.784	0.931				
Leadership	0.782	0.820	0.784	0.815			
Management of processes	0.731	0.707	0.710	0.687	0.917		
Results	0.766	0.757	0.678	0.764	0.670	0.851	
Strategic planning	0.770	0.774	0.755	0.740	0.775	0.627	1

Note: ^aNote that the diagonal entries (i.e. square root of average variance extracted) should be higher than the off-diagonal entries (i.e. correlation between the constructs)

Table II.
Discriminant validity of current configuration (Fornell-Larcker)

Table III.
Discriminant validity
of current
configuration
(HTMT-inference)

HTMT (CI-bias-corrected bootstrap)	Original sample (<i>O</i>)	Sample mean (<i>M</i>)	Bias	2.50%	97.50%
Information and analysis → customer satisfaction	0.951	0.951	0	0.893	1.011
Results → leadership	0.931	0.931	0	0.857	1.004
Leadership → information and analysis	0.922	0.922	0	0.86	0.983
Human resource development → customer satisfaction	0.93	0.93	-0.001	0.888	0.966
Leadership → human resource development	0.908	0.907	-0.001	0.855	0.954
Leadership → customer satisfaction	0.883	0.882	-0.001	0.814	0.944
Results → customer satisfaction	0.876	0.876	0.001	0.811	0.943
Information and analysis → human resource development	0.885	0.884	0	0.827	0.942
Management of processes → information and analysis	0.854	0.856	0.001	0.769	0.941
Results → management of processes	0.828	0.831	0.002	0.729	0.94
Management of processes → customer satisfaction	0.859	0.86	0.001	0.785	0.934
Results → human resource development	0.859	0.86	0	0.786	0.931
Strategic planning → management of processes	0.858	0.858	0	0.791	0.923
Management of processes → leadership	0.823	0.822	0	0.731	0.911
Results → information and analysis	0.808	0.811	0.003	0.73	0.897
Management of processes → human resource development	0.817	0.817	0	0.736	0.895
Strategic planning → information and analysis	0.821	0.821	0	0.75	0.889
Strategic planning → customer satisfaction	0.817	0.817	0	0.761	0.87
Strategic planning → human resource development	0.806	0.806	0	0.75	0.86
Strategic planning → leadership	0.796	0.795	0	0.727	0.859
Strategic planning → results	0.692	0.694	0.002	0.606	0.789

analysis → customer satisfaction, and results → leadership) are above 1, indicating lack of discriminant validity.

A rearrangement was conducted based on the problematic indicators' correlation matrix (see Figure 2) and their contents, as described in the SIQ model manual. All the constructs and their relationships remained the same. Three indicators were found to be problematic and were moved to other constructs:

- (1) Sub-criterion 7.5 ("results – customer satisfaction," coded as CS5) was moved under "results" because it is more correlated to the sub-criteria in "results" than to the sub-criteria in "customer satisfaction" itself. This move can also be justified by considering the fact that CS5 also only deals with results. Specifically, the correlation between CS5 and R1 is as high as 0.79 (italicized in Figure 2).
- (2) Sub-criterion 7.1 ("customer expectations," CS1) was moved under "information and analysis." It has correlation values higher than 0.7 with the indicators under "information and analysis" (IA1 and IA2). As described in the SIQ model manual, CS1 deals with how the organization collects information about current and future customers and their needs and expectations. This is closely related to "information and analysis," which deals with how such information is managed.
- (3) Sub-criterion 6.3 ("results – community involvement and environmental management," R3) was moved to "leadership." It has a higher correlation value with sub-criterion 1.5 ("environmental management," L5) than with other sub-criteria under "results." This move can be justified on the basis that the two criteria concern the same subject.

4.2 Revised SIQ model

Figure 3 shows the final model after the three rearrangements. We refer to this figure as the "revised SIQ model" and use this term for the remainder of the analysis. Note that the

	L1	L2_3	L4	L5	IA2	IA1	R2	R3	R1	CS1	CS2	CS3	CS4	CS5
L1	1													
L2_3	0.70	1												
L4	0.58	0.54	1											
L5	0.48	0.51	0.51	1										
IA2	0.66	0.62	0.54	0.49	1									
IA1	0.73	0.62	0.58	0.44	0.73	1								
R2	0.54	0.41	0.53	0.42	0.43	0.46	1							
R3	0.52	0.56	0.62	0.68	0.53	0.50	0.58	1						
R1	0.62	0.63	0.49	0.36	0.62	0.65	0.62	0.56	1					
CS1	0.73	0.77	0.46	0.49	0.71	0.72	0.42	0.57	0.65	1				
CS2	0.64	0.36	0.39	0.26	0.51	0.61	0.50	0.39	0.54	0.50	1			
CS3	0.67	0.61	0.44	0.43	0.65	0.68	0.37	0.51	0.57	0.72	0.63	1		
CS4	0.68	0.55	0.45	0.45	0.69	0.71	0.46	0.49	0.63	0.70	0.69	0.68	1	
CS5	0.57	0.57	0.53	0.40	0.59	0.61	0.56	0.57	0.79	0.60	0.50	0.62	0.69	1

Figure 2. Correlations among problematic indicators (shaded areas represent correlations within the same construct)



Figure 3. The revised SIQ model

feedback loop, which indicates a non-recursive relationship (see Figure 1), has been removed because it does not represent a cause-and-effect relationship. This removal was confirmed by interviewing SIQ staff who know the historical idea of the model. The discriminant validity assessment results of the revised SIQ model are provided in Tables IV and V, which

Table IV.
Discriminant validity
of revised SIQ model
(Fornell-Larcker)

Fornell-Larcker criterion ^a	Customer satisfaction	Human resource development	Information and analysis	Leadership	Management of processes	Results	Strategic planning
Customer satisfaction	0.881						
Human resource development	0.794	0.881					
Information and analysis	0.809	0.828	0.902				
Leadership	0.707	0.811	0.814	0.809			
Management of processes	0.738	0.708	0.713	0.682	0.917		
Results	0.707	0.773	0.711	0.736	0.66	0.879	
Strategic planning	0.764	0.774	0.765	0.723	0.776	0.635	1

Note: ^aNote that the diagonal entries (i.e. square root of average variance extracted) should be higher than the off-diagonal entries (i.e. correlation between the constructs)

Table V.
Discriminant validity
of revised SIQ model
(HTMT-inference)

HTMT (CI-bias-corrected bootstrap)	Original sample (O)	Sample mean (M)	Bias	2.50%	97.50%
Information and analysis → customer satisfaction	0.925	0.925	0	0.876	0.974
Management of processes → customer satisfaction	0.879	0.88	0.001	0.798	0.961
Leadership → information and analysis	0.91	0.91	0	0.864	0.957
Information and analysis → human resource development	0.911	0.911	0	0.868	0.950
Human resource development → customer satisfaction	0.888	0.889	0	0.833	0.945
Strategic planning → management of processes	0.858	0.859	0.001	0.794	0.926
Results → human resource development	0.863	0.862	-0.001	0.796	0.925
Leadership → human resource development	0.875	0.875	0	0.822	0.924
Management of processes → information and analysis	0.837	0.839	0.002	0.765	0.915
Results → leadership	0.848	0.847	-0.002	0.773	0.912
Results → customer satisfaction	0.819	0.82	0.001	0.730	0.910
Results → management of processes	0.799	0.8	0.001	0.698	0.905
Management of processes → human resource development	0.817	0.817	0	0.733	0.896
Management of processes → leadership	0.798	0.798	0	0.706	0.888
Results → information and analysis	0.811	0.811	0	0.734	0.885
Strategic planning → customer satisfaction	0.823	0.823	0	0.759	0.883
Leadership → customer satisfaction	0.794	0.794	0	0.708	0.877
Strategic planning → information and analysis	0.813	0.813	0	0.750	0.870
Strategic planning → human resource development	0.806	0.806	0	0.748	0.858
Strategic planning → leadership	0.757	0.757	-0.001	0.685	0.825
Strategic planning → results	0.688	0.688	0	0.597	0.775

are set out in the same way as Tables II and III. Now there does not appear to be any problem with the discriminant validity for both Fornell-Larcker and HTMT-inference criteria. The convergent validity (all AVE values are above 0.5) and internal consistency reliability criteria (Cronbach's α and ρ -c values are above 0.7) are met.

4.3 Descriptive statistics of revised SIQ model

The descriptive statistics of the main criteria and sub-criteria are given in Tables VI and VII, respectively. The values for the main criteria are obtained from the total of the sub-criteria

based on the revised model (Figure 3). For readers interested in the statistical differences between the scores in private and public organizations' main criteria, we refer to the study by Eriksson (2016).

4.4 Scores over time

The mean values of the main criteria scores, in the form of points, from 1992 to 2014, are shown in Figure 4. As in the previous section, the values for the main criteria for each applicant are obtained from the total of the sub-criteria following the revised model (Figure 3). It appears that the trends for all main criteria do not differ markedly over time. The linkages among the main criteria, namely, the paths in the SIQ model are therefore likely to remain stable over time.

Table VI.
Descriptive statistics for applicants score in the main criteria (revised model)

Main criteria	Mean		Median		SD		Min.		Max.	
	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public
Leadership	58.7	62.3	55.5	58.4	24.2	29.7	9.0	8.5	122.8	133.8
Information and analysis	48.2	48.0	46.2	46.3	18.1	20.7	12.8	9.5	91.0	97.0
Strategic planning	26.2	24.6	25.5	25.1	9.8	9.4	6.0	7.2	52.8	41.4
Human resource development	58.3	57.6	56.3	55.0	21.3	23.0	11.5	11.3	107.3	121.5
Management of process	54.2	43.8	51.5	42.3	20.5	20.0	17.0	10.6	101.6	98.0
Results	60.2	60.4	53.0	46.6	36.4	41.0	4.5	0.0	157.0	176.0
Customer satisfaction	59.1	54.4	57.5	54.9	20.4	22.5	17.0	11.5	110.0	106.3

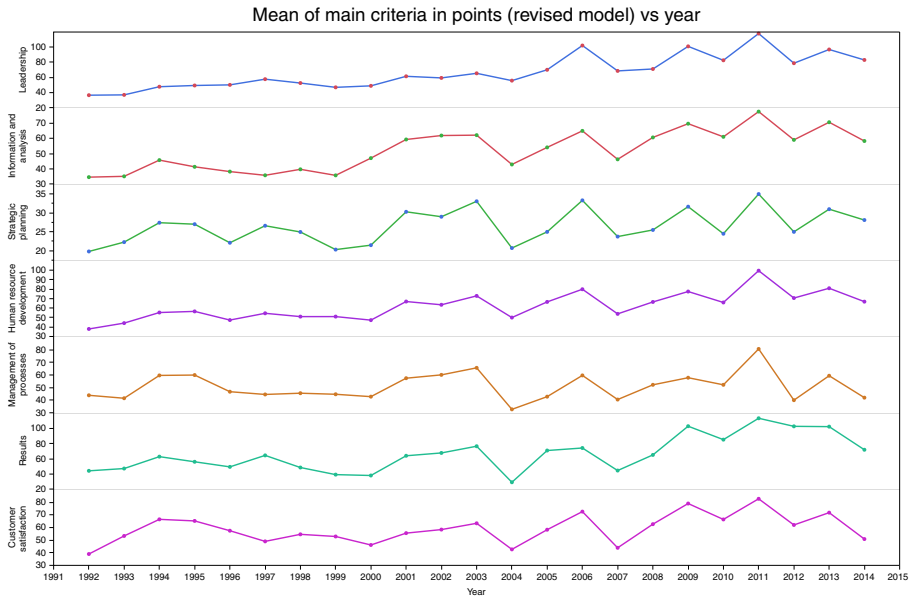
Note: N(private) = 93; N(public) = 72

Table VII.
Descriptive statistics for applicants score in the sub-criteria

Sub-criteria	Mean		Median		SD		Min.		Max.	
	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public
L1	22.0	21.7	22.5	22.5	7.1	7.8	4.5	4.5	38.3	40.5
L2_3	15.2	18.2	12.5	15.0	9.2	11.8	2.5	2.0	45.0	55.5
L4	4.8	4.4	4.5	3.8	2.8	2.5	0.0	0.0	12.0	10.5
L5	10.9	11.9	10.5	12.0	5.9	6.3	0.0	0.0	26.3	24.0
IA2	8.1	8.3	7.5	7.5	4.0	4.5	0.0	0.0	17.5	17.5
IA1	20.6	19.4	20.3	18.0	7.9	8.5	5.0	3.0	40.5	39.1
SP1	26.2	24.6	25.5	25.1	9.8	9.4	6.0	7.2	52.8	41.4
HRD1	10.5	10.0	10.0	10.0	4.3	4.3	0.0	2.0	19.5	18.8
HRD2	12.5	11.6	12.5	11.4	4.3	4.0	2.5	3.8	26.0	22.5
HRD3_6	19.2	20.6	18.3	18.4	8.7	9.9	2.0	2.0	42.3	50.8
HRD4	7.2	6.8	7.0	6.6	3.6	3.8	0.0	0.0	16.3	18.0
HRD5	9.0	8.6	9.0	8.4	3.4	3.3	2.0	0.0	17.8	16.0
MP3	7.6	5.8	7.0	6.0	3.5	3.1	0.0	0.0	15.0	16.0
MP1_2	46.6	38.0	45.0	36.0	18.2	17.6	10.0	10.6	87.6	82.0
R2	3.0	2.3	2.0	2.0	3.4	2.8	0.0	0.0	15.5	12.0
R3	5.9	6.2	4.0	4.0	5.5	6.4	0.0	0.0	20.0	26.0
R1	25.1	25.2	22.5	20.0	15.9	18.1	0.0	0.0	70.0	75.0
CS1	19.5	20.3	17.5	18.2	7.9	9.9	5.3	2.8	40.0	42.5
CS2	25.3	21.7	24.0	21.6	8.5	8.3	9.6	6.0	48.0	40.5
CS3	10.0	8.4	10.0	7.5	4.4	4.6	1.5	0.0	20.0	20.0
CS4	23.8	24.3	24.0	24.0	10.5	11.5	0.0	0.0	51.0	49.8
CS5	32.1	32.9	30.0	28.2	20.9	22.5	0.0	0.0	90.0	90.0

Note: N(private) = 93; N(public) = 72

Figure 4.
Trends of main
criteria scores
over time



4.5 Comparing private and public organizations

The PLS algorithm (implemented in SmartPLS software) was used for estimating the loadings of each construct. A bias-corrected bootstrap with 5,000 samples (significance level = 0.05) was conducted to test the statistical significance of the paths in both private and public organizations. The results are shown in Table VIII. For the measurement model, all loadings are significant and greater than 0.707. For the structural model, most of the paths are statistically significant. In other words, we have found – with the exception of three paths – strong evidence to support *H1* and *H2*. Those three paths are as follows:

- (1) The path from “information and analysis” to “results” (information and analysis → results) in private organizations is not statistically different from zero, based on the sample. This means that we do not have sufficient evidence to substantiate the effect of “information and analysis” on “results” in private organizations.
- (2) The path from “strategic planning” to “results” is not statistically significant in private organizations, but it is in public organizations with a negative coefficient. This is rather surprising since the zero-order correlation between the two constructs is positive. Nevertheless, the negative coefficient should be interpreted because it reflects the effect of “strategic planning” on “results” after other predictor constructs are held constant or controlled for.
- (3) The path from “management of processes” to “results” (management of processes → results) in public organizations is not significantly different from zero (not statistically significant).

The model assessment results are shown in Table IX. The R^2 adjusted (R^2 adj.) is used to consider the different sample size between private and public organizations. In general, the endogenous constructs in public organization have higher R^2 adjusted values than those of private organizations, except for “results” (0.625 vs 0.634). This implies that the variation

Table VIII.
The path coefficients of revised SIQ model

	Private (n = 93)				Public (n = 72)			
	bc bootstrap		95% CI		bc bootstrap		95% CI	
Path coefficients	Coeff.	p-value	Lower	Upper	Coeff.	p-value	Lower	Upper
Human resource development → results	0.501	0.000	0.282	0.724	0.527	0.000	0.284	0.811
Information and analysis → results	0.066	0.593	-0.187	0.302	0.370	0.006	0.118	0.641
Leadership → human resource development	0.784	0.000	0.731	0.850	0.849	0.000	0.798	0.903
Leadership → information and analysis	0.809	0.000	0.756	0.873	0.825	0.000	0.773	0.884
Leadership → management of processes	0.651	0.000	0.554	0.764	0.803	0.000	0.727	0.876
Leadership → strategic planning	0.712	0.000	0.626	0.805	0.759	0.000	0.675	0.835
Management of processes → results	0.264	0.008	0.082	0.459	0.179	0.209	-0.112	0.460
Results → customer satisfaction	0.692	0.000	0.603	0.810	0.741	0.000	0.660	0.845
Strategic planning → results	0.051	0.632	-0.151	0.267	-0.274	0.027	-0.532	-0.040
Outer loadings	Loadings	p-value	Lower	Upper	Loadings	p-value	Lower	Upper
CS1 ← information and analysis	0.897	0.000	0.845	0.938	0.909	0.000	0.868	0.948
CS2 ← customer satisfaction	0.827	0.000	0.752	0.892	0.922	0.000	0.867	0.958
CS3 ← customer satisfaction	0.859	0.000	0.763	0.915	0.877	0.000	0.825	0.927
CS4 ← customer satisfaction	0.908	0.000	0.875	0.939	0.921	0.000	0.879	0.956
CS5 ← results	0.894	0.000	0.858	0.930	0.922	0.000	0.872	0.957
HRD1 ← human resource development	0.848	0.000	0.778	0.901	0.909	0.000	0.868	0.943
HRD2 ← human resource development	0.857	0.000	0.807	0.904	0.875	0.000	0.808	0.920
HRD3_6 ← human resource development	0.877	0.000	0.830	0.924	0.918	0.000	0.869	0.952
HRD4 ← human resource development	0.886	0.000	0.843	0.925	0.905	0.000	0.850	0.942
HRD5 ← human resource development	0.858	0.000	0.803	0.911	0.912	0.000	0.881	0.947
IA1 ← information and analysis	0.933	0.000	0.914	0.955	0.879	0.000	0.807	0.936
IA2 ← information and analysis	0.887	0.000	0.833	0.928	0.915	0.000	0.883	0.946
L1 ← leadership	0.819	0.000	0.774	0.870	0.873	0.000	0.825	0.920
L2_3 ← leadership	0.784	0.000	0.720	0.858	0.892	0.000	0.846	0.933
L4 ← leadership	0.800	0.000	0.716	0.870	0.808	0.000	0.718	0.876
L5 ← leadership	0.751	0.000	0.610	0.841	0.770	0.000	0.667	0.844
MP1_2 ← management of processes	0.914	0.000	0.887	0.941	0.934	0.000	0.899	0.961
MP3 ← management of processes	0.883	0.000	0.820	0.928	0.927	0.000	0.883	0.961
R1 ← results	0.909	0.000	0.866	0.946	0.942	0.000	0.911	0.965
R2 ← results	0.769	0.000	0.658	0.870	0.863	0.000	0.800	0.921
R3 ← leadership	0.777	0.000	0.642	0.878	0.840	0.000	0.787	0.892
SP1 ← strategic planning	1		1	1	1		1	1

Table IX.
Model assessment of revised SIQ model

	$\rho-c$	Cronbach's α	AVE	R^2 adj.	Q^2 (D = 7)
<i>Private (n = 93)</i>					
Customer satisfaction	0.899	0.833	0.749	0.473	0.344
Human resource development	0.937	0.916	0.749	0.611	0.448
Information and analysis	0.932	0.891	0.821	0.651	0.532
Leadership	0.890	0.848	0.619	na	na
Management of processes	0.893	0.763	0.807	0.417	0.330
Results	0.894	0.822	0.739	0.634	0.455
Strategic planning	1.000	1.000	1.000	0.501	0.491
<i>Public (n = 72)</i>					
Customer satisfaction	0.933	0.892	0.822	0.543	0.444
Human resource development	0.957	0.944	0.817	0.717	0.585
Information and analysis	0.928	0.885	0.812	0.676	0.551
Leadership	0.922	0.894	0.702	na	na
Management of processes	0.928	0.845	0.866	0.639	0.549
Results	0.935	0.895	0.828	0.625	0.516
Strategic planning	1.000	1.000	1.000	0.570	0.560

inherent in the constructs in private organizations is more difficult to explain. The convergent validity (all AVE values are above 0.5) and internal consistency reliability criteria (Cronbach's α and ρ -c values are above 0.7) are met for both organizations.

To assess the predictive relevance, we conducted blindfolding to obtain cross-validated redundancy measures for each endogenous construct with omission distance of 7 ($D=7$). The resulting Q^2 values of blindfolding are shown in the last column of Table IX. The fact that all Q^2 values are greater than 0 means that all of the independent constructs have predictive relevance for the dependent constructs (Hair *et al.*, 2014). For example, "leadership" has predictive relevance for "human resource development."

We also analyzed the effect size values (f^2), with results shown in Figure 5. The effect size, f^2 , values show the contribution of an exogenous construct (such as leadership) toward the R^2 of an endogenous construct (such as strategic planning). Hair *et al.* (2014) recommended that the f^2 values of 0.35, 0.15, and 0.02 should be large, medium, and small, respectively. Certain observations are worth highlighting here:

- Confirming the R^2 adjusted results (Table IX), the effect size values of the constructs in public organizations are generally higher than those in private organizations.
- The contribution of "leadership" toward the R^2 of its direct effects (human resource development, information and analysis, management of processes, strategic planning) is strong, and much higher than the cut-off value of 0.35 (Hair *et al.*, 2014). "Results" made a similar contribution to the R^2 of "customer satisfaction."

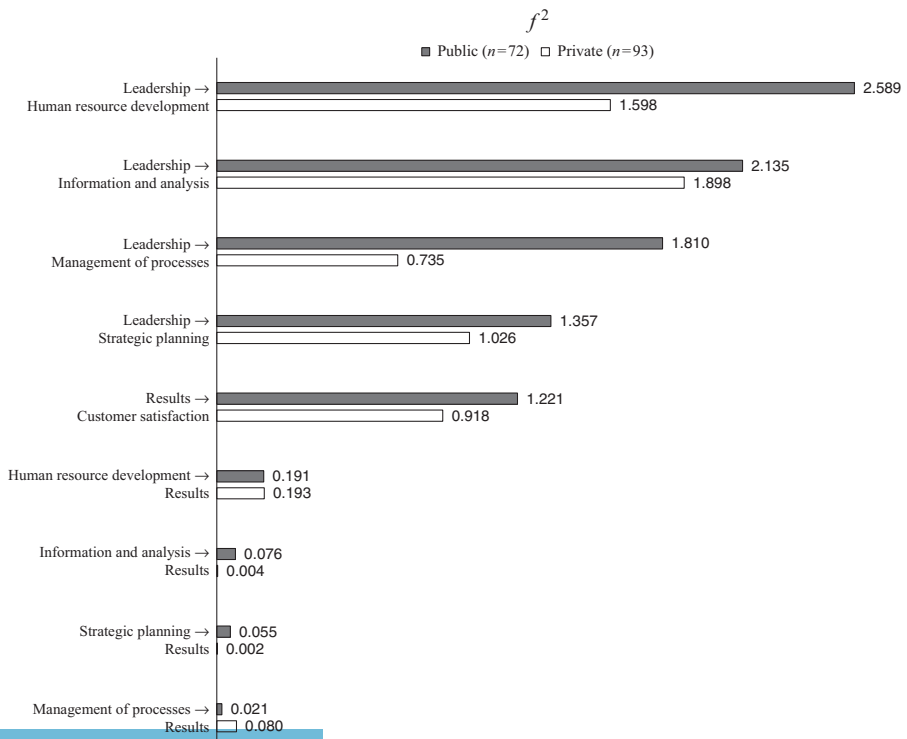


Figure 5.
The f^2 values

- The contribution of “human resource development” toward the R^2 of “results” is at the medium level for both types of organizations.
- The contribution of “information and analysis,” “management of processes,” and “strategic planning” toward explaining the variation in “results” is relatively small.

Figure 6 provides the path diagrams for both private and public organizations. The italicized numbers represent the paths’ coefficients for public organizations. The effect of “leadership” on its direct subsequent constructs can generally be seen to be very strong. More specifically, the path from “leadership” → “human resource development” → “results” is strong for both private and public organizations.

The PLS-MGA results for comparing private and public organization path coefficients are shown in Table X. Note that the PLS-MGA method (Henseler *et al.*, 2009) uses a bootstrapping procedure and the reported p -value is the percentage of the bootstrapped comparisons between the two groups that meet a certain criterion (e.g. Group 1 > Group 2). Therefore, a percentage smaller than 0.05 or larger than 0.95 indicates a significant

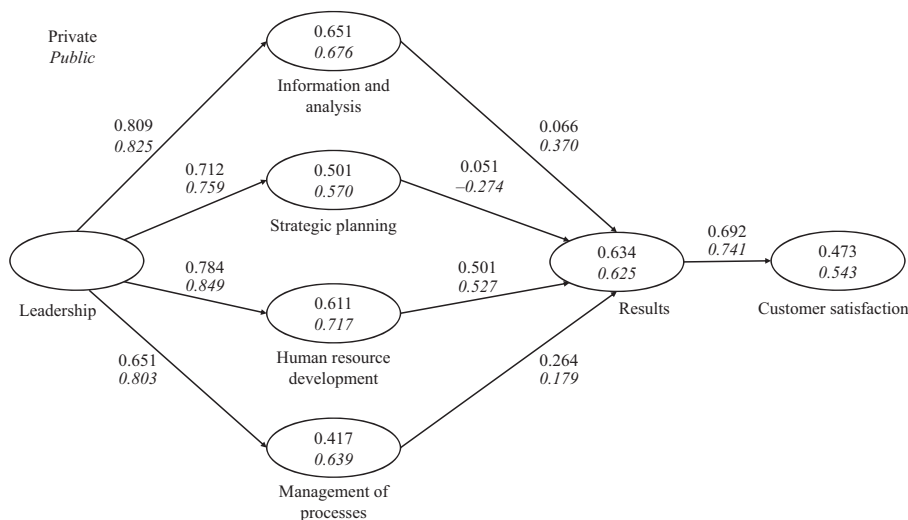


Figure 6. Path diagram with R^2 adjusted on the constructs

PLS-MGA	Path coefficients – diff. (1 Private (1.0)-Public (2.0))	p -value (Private (1.0) vs Public (2.0))
Human resource development → results	0.026	0.556
Information and analysis → results	0.304	0.954
Leadership → human resource development	0.065	0.941
Leadership → information and analysis	0.016	0.645
Leadership → management of processes	0.152	0.988
Leadership → strategic planning	0.047	0.782
Management of processes → results	0.085	0.309
Results → customer satisfaction	0.05	0.752
Strategic planning → results	0.325	0.023

Table X. Comparing paths using PLS-MGA

difference. Three paths show significant differences. *H3* is therefore moderately substantiated. The statistically significant paths are discussed as follows:

- The path “Leadership → management of processes.” The public organizations have a significantly higher coefficient than private organizations (0.803 vs 0.651).
- The path “information and analysis → result.” For public organizations, the coefficient is positive (0.370), while for private organization it is not statistically different from zero.
- The path “Strategic planning → results.” For public organizations, it is statistically significant and negative (−0.274), while for private organizations it is not significantly different from zero.

The final analysis we conducted is the PLS-IPMA, which helped us identify the key driver constructs for creating business “results.” We chose “results” as the target construct instead of “customer satisfaction” because of the model configuration, where “customer satisfaction” is a direct effect of “results.” Furthermore, the revised model has taken into account results from customer satisfaction, that is, sub-criterion 7.5 (coded as “CS5”).

The PLS-IPMA is generally useful for highlighting significant areas for improvement. Constructs that have high importance and low performance should have the main focus, while those with low importance and high performance should be reviewed. With respect to the target endogenous construct, the importance value of a construct is obtained from its total effect on the target construct, while the performance value is obtained from the average value of its latent variable scores. The details of PLS-IPMA method can be found in Hock *et al.* (2010) or Hair *et al.* (2014). For the weight conversion of each sub-criterion into a value between 0 and 100, the latest point allocation of the SIQ (2015) model is used for the maximum values of each sub-criterion (see Table I). In the case when the actual maximum value is greater than the allocated point in Table I (the maximum possible value), the actual maximum value is used.

The plot for importance (total effects) and performance (average latent scores) is shown in Figure 7. Note that the latent scores are rescaled to a scale of 0-100 as to facilitate comparison among latent constructs measured on different scale levels. In general, we can make the following observations:

- The performance of private organizations is almost always higher than that of public organizations. The performance of “management of processes” in public organizations is the lowest.

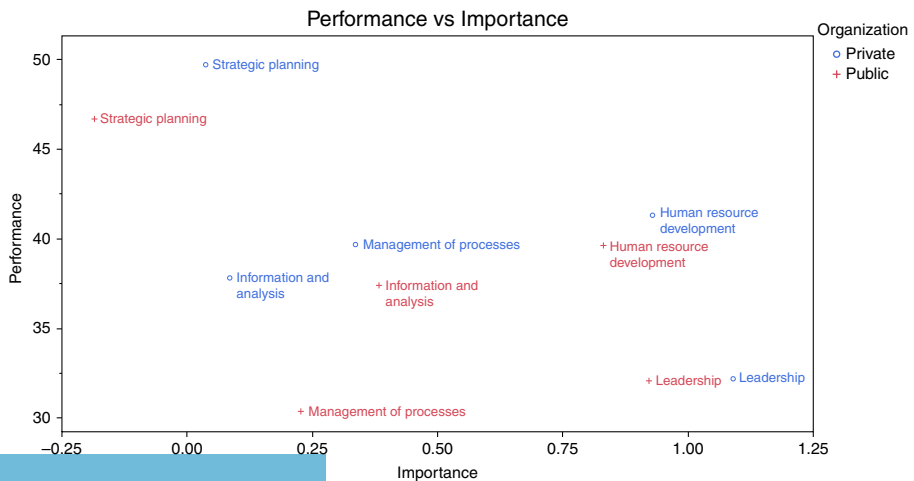


Figure 7.
PLS-IPMA map
(target construct:
results)

- The most important construct for creating “results” is “leadership,” for both private and public organizations. However, the performance is quite low.
- For private organizations, “management of processes” is more important than “information and analysis,” whereas the opposite applies for public organizations.
- “Human resource development” is an important key driver for creating “results” and has quite high performance.
- “Strategic planning” for private organizations has the highest performance, but the lowest importance. “Strategic planning” for public organizations has higher importance, in terms of its absolute value, than that of private organizations. The performance of “strategic planning” in both types of organizations is quite high. This requires attention because it is not especially important for “results,” but many organizations performed quite well in this criterion.

5. Discussion

5.1 *The paths in the excellence models for public and private organizations*

With respect to *H1* and *H2*, we failed to find statistical significance in three paths in the SIQ model. Sabella *et al.* (2014) found that the path from information and analysis to performance (“results” in our study) was significant for their sample. Our study suggests that the information and analysis criterion has an impact on the results criterion for public organizations, but that the impact was not significant for private organizations. Second, the path coefficient of the path “strategy planning to results” is near zero and negative for private and public organizations, respectively. This could be related to the fact that many public organizations do not have the same strategic freedom as private organizations because some of their strategic goals are determined by the political system (Eskildsen *et al.*, 2004; Elg *et al.*, 2017). This can imply that public organizations, in particular, should spend less energy and resources on strategic planning as they seem to lose sight of the goal of achieving good results. In private organizations, there seems to be no guarantee that a good planning will lead to a good result. The impact of strategic management (“strategy planning” in our study) on the results was shown in the study by Su *et al.* (2003).

Lastly, the data did not significantly support the “management of processes” to “results” path for public organizations. This path has been empirically shown in other articles that did not analyze public and private differences (Curkovic *et al.*, 2000; Fotopoulos and Psomas, 2010; Sabella *et al.*, 2014; Calvo-Mora *et al.*, 2014). Furthermore, Eriksson (2016) has argued that the process management models and framework fit public organizations badly. The present study supports the findings by Eriksson (2016), given that no significant effect from the process management on the results could be found for public organizations.

On the other hand, several paths were empirically shown to be valid both for private and public organizations and in accordance with other studies. The leadership criterion has an impact on information and analysis (Su *et al.*, 2003; Moon *et al.*, 2011), strategic planning (Jayamaha *et al.*, 2008; Heras-Saizarbitoria *et al.*, 2012), human resource development (Gómez-Gómez *et al.*, 2011; Heras-Saizarbitoria *et al.*, 2012), and management of processes (Moon *et al.*, 2011), for both private and public organizations. Moreover, the human resource development criterion has an impact on the results criterion (Calvo-Mora *et al.*, 2014), and the results criterion has an impact on the customer satisfaction criterion, both for private and public organizations.

5.2 *Are there any differences between public and private?*

The third hypothesis and its two connected hypotheses investigate whether there are significant differences in the relationship among the criteria between private and public

organizations. Although there have been studies of private and public differences (Perry and Rainey, 1988; Boyne, 2002; Hvidman and Andersen, 2014), our approach is unique in terms of using applicants' score data that originate from business excellence models. Surprisingly, we only found three significant differences between public and private organizations when studying the relations between the criteria. Although earlier research has pointed out general differences between public and private organizations (see Section 2.2), it seems that most of the paths in the SIQ model do not differ significantly. One explanation could be that our sample size is not large enough to substantiate the differences. Our study is among the few which address how the differences between private and public organizations are manifested in the paths of business excellence models. With regard to the detected differences, three points can be made. First, the information and analysis effect on results was different between public and private organizations in the sense that the relation was significantly stronger for public organizations (which contradicts *H3b*). Hence, it seems like there is more to gain in terms of results for public organizations to succeed with managing the information and analysis. Information and analysis can play an important part in the more participative culture that the public organizations seem to have (see Hansen and Villadsen, 2010).

Second, the path from leadership to management of processes is also significantly stronger for public organizations than for their private counterparts. It appears that the leaders play a more important role in the management of processes for public organizations (which supports *H3a*). As described in Section 2, Andersen (2010) found that public managers in Sweden have a more change-oriented leadership style (e.g. pushing for growth, initiating new projects, offering ideas about new and different ways of doing things, giving thoughts and plans for the future), which could explain why the path is stronger in public organizations.

Third, the impact of strategic planning on results is significantly stronger in public organizations than in private organizations, but with a negative direction. In other words, the high scores in strategic planning are associated with low scores in results for public organizations, and vice versa. This still supports *H3b* because the impact of strategic planning on results is positively stronger for private organizations than for public ones. Boyne's (2002) claim that bureaucracy is higher in public organizations than in private ones could partly explain why high performance in strategic planning may lead to low performance in business results. For private organizations, high performance in strategic planning is not always associated with high performance in business results.

6. Conclusions

The present study aimed to explore the differences between public and private organizations in the paths of business excellence models and to identify the key drivers for creating business results and customer satisfaction. In line with previous research, we confirmed that leadership is a very strong predictor of human resource development, information and analysis, management of processes, and strategic planning. It is also the most important driver of business "results." Unfortunately, most of the organizations did not score high with respect to this criterion. In general, it is difficult to explain or predict the variation in business "results" for private and public organizations. The performance of private organizations is almost always higher than that of public ones, in all criteria. However, the variation in private organizations' endogenous constructs is more difficult to explain or predict than that in public organizations.

Specifically, we can summarize our findings on the differences between public and private organizations into three points. First, the effect of "leadership" on "management of processes" is significantly higher in public organizations than in private ones. However, in public organizations, the "management of processes" does not really predict business "results" and the effect is not statistically significant either. Second, for private organizations, the

“management of processes” is a more important driver for creating business results than “information and analysis,” whereas the reverse applies for public organizations. This may imply that, when trying to achieve excellence, private organizations should focus primarily on “management of processes” and public organizations should focus on “information and analysis.” Third, the effect of strategic planning on creating business results is negative for public organizations and remains inconclusive, due to insufficient evidence, for private organizations. In other words, a high performance in strategic planning may lead to a low performance in business results in public organizations. Most of the organizations have high scores in this criterion despite the fact that it is among the least important criteria for predicting business results. A practical implication is that the criterion “strategic planning” should be reviewed in the SIQ excellence model.

A limitation of the present study is that it only covers a relatively small geographical region, which implies that our results cannot be generalized. Different national cultures may have different results when using excellence models (Flynn and Saladin, 2006). Another limitation may be the use of applicants’ scores data over the years and the reflective measurement model. The longitudinal effect over the two decades, such as the effect of SIQ model diffusion on the characteristics of the organizations applying for the award over time or socio-economic changes in the country during global recession in 2008, could be worth investigating. With respect to the reflective measurement model, another way to look at the main criteria is that they are derived from aggregating the sub-criteria; in this case, it could be interesting to assume a formative measurement model.

In sum, we hope that this study will enhance the knowledge regarding the use of business excellence models in private and public organizations and support the move toward more tailor-made models for specific sectors. We also hope that this research will contribute to a deeper theoretical understanding on business excellence and QM, and especially how business excellence can be contextualized to better fit different organizations.

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Further reading

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About the authors

Hendry Raharjo received his Joint-PhD Degree from the National University of Singapore and Eindhoven University of Technology. He is working as an Associate Professor at the Division of Service Management and Logistics at Chalmers University of Technology. His research focuses on the use of quantitative methods and statistical engineering in product and service quality improvement works. Hendry Raharjo is the corresponding author and can be contacted at: hendry@chalmers.se

Henrik Eriksson, PhD, is an Associate Professor at the Division of Service Management and Logistics and the Centre for Healthcare Improvement (CHI) at Chalmers University of Technology. He has been working for a number of years as the Quality and Development Director in the Healthcare. He has a number of research interests, including quality improvement in healthcare, quality management in theory and practice and business excellence and quality awards.

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